NORTHEASTERN SECTION

NEWSLETTER

FALL 1990

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FUTURE SECTION MEETINGS

Framingham State College
November 16-17, 1990
Local Arrangements Chair: Thomas Koshy
Program Co-Chairs: Thomas Moore, Bridgewater State College
and Kenneth Preskenis, Framingham State College
See this bulletin for details

Vermont Technical College
June 7-8, 1991
Local Arrangements Chair: Paul Calter

A MESSAGE FROM THE CHAIR

The MAA's 75th anniversary meeting in Columbus was highlighted by MAA day. The day began with impressive opening ceremonies, featured many well known speakers and concluded with a banquet and a presentation on the history of the MAA in the context of world events. The Polya Distinguished Lecture Series was approved by the Board of Governors. Beginning next year, one of the outstanding speakers in this program will be available to speak at five or six section meetings each year. Much of the programming at the meeting focused on the student chapters and activities for students. Certificates were presented to the two hundred and fifty-eight charter student chapters (including eighteen from the Northeastern Section). There were special presentations for students, a student papers session and a breakfast meeting for student chapter advisors. Student programs will become a regular part of national meetings.

As you may know, the Northeastern Section was one of four sections selected to receive a $1500 grant to the MAA from the Exxon Education Foundation to integrate more student activities into section meetings. The grant, supplemented by the Section, was used to present an extensive student program and to cover student expenses at our Spring Meeting. Highlights of this program included a presentation on "The Josephus Problem" by Herb Wilf, a student swap session, our usual student papers session and a two-part minicourse entitled "Chaos, Fractals and Dynamics: Computer Experiments in Mathematics" presented by Robert Devaney (Boston University) and Marilyn Durkin (Bentley College). As a result of the success of this minicourse, Bob and Lynne have been selected to present the student minicourse at the national meeting which will be held in San Francisco in January. This minicourse was video taped and is available for student chapter viewing; please contact me if you are interested. Approximately thirty students attended this program.

Much emphasis is being placed on student chapters at both the section and the national level. I encourage you to form a student chapter at your school. For more information, contact our Student Chapter Coordinator, Thurmon Whitley at the University of New Haven. See page 19 for his address and for additional information regarding student chapter activities.

Progress is being made on bringing one of the national minicourses to our Section. I hope to have a report for you at the Fall Meeting.

In the Spring 1990 issue of this newsletter, I asked for volunteers to assist in the many activities of the Section. The response to this request was most gratifying. Sonja Sandburg of Framingham State College is our new Publisher's Liaison. Her function is to arrange for as many as possible book displays at the fall meetings. The fees received from publishers who exhibit at these meetings goes a long way toward defraying meeting expenses. When publisher's representatives call at your school, you should tell them to contact Sonja (508-626-4728) to be sure that their company will be exhibiting at our Fall Meeting. Donna Beers of Simmons College has volunteered to serve the Section as New Programs Coordinator. Thomas Koshy of Framingham State College has agreed to serve as Regional Dinner Meetings Coordinator. Our new Public Information Officers are Stephen Kenton of Eastern Connecticut State University for the southern New England region and Edwin Wolf of Keene State College for the northern New England region.

My thanks to Donna Beers of Simmons College and her program committee for their hard work in formulating such an excellent program for our Spring Meeting and to John O'Connell for extending the hospitality of Roger Williams College to the members of our Section. Thanks also to Malcolm MacGregor of Massachusetts Maritime Academy for video taping the student minicourse.

At our Fall Meeting, we will celebrate the 35th anniversary of the Northeastern Section. Program Co-Chairs Tom Moore and Ken Preskenis and their committee have planned a diverse and interesting program with many workshops and outstanding speakers. The keynote speaker will be Howard Eves, the founder of the Northeastern Section. I look forward to seeing you at Framingham State College on November 16-17.

Karen J. Schroeder
Bentley College
Chairperson NES/MAA

REPORT OF THE NOMINATING COMMITTEE

The following is the slate of nominees for the 1990 election to be held on November 17, 1990 at Framingham State College as recommended by the Nominating Committee:

VICECHAIR

1. **Laura L. Kelleher**
   Massachusetts Maritime Academy
2. **Edward Sandifer**
   Western Connecticut State University

SECRETARY/TREASURER

1. **Helen E. Salzberg**
   Rhode Island College
2. **Premjit Singh**
   Fitchburg State College

TWO-YEAR COLLEGE REPRESENTATIVE

1. **Joseph Menard**
   Community College of Rhode Island
2. **Helene Savicki**
   Dean Junior College

The Nominating Committee consists of Kenneth Schoen of Worcester State College (Chairman), Diane Haber of Westfield State College, Dennis Luciano of Western New England College and Barry Schiller of Rhode Island College.

GOVERNOR'S MESSAGE

Greetings. The national MAA is active, growing and getting stronger every day. Our financial house is in order, a "new" team headed by Marcia Sward, Executive Director, is in place, and the MAA has taken the lead in the movement to reform mathematics education in our country. Although it is tempting to report on the activities of one or more of the 88 committees of the MAA, to discuss the recommendations for preparation of teachers, or the developing idea for a national center for the teaching of undergraduate mathematics, or the growth and activities of the Student Chapters (over 270 chapters), etc., I will use my "space" for a few comments on our role in reforming undergraduate mathematics.

The National Research Council has completed several years of background study on mathematics education as have the NCTM and other groups. The results of these studies are clearly set forth in several books (*Everybody Counts, A Matter of Numbers, Renewing U. S. Mathematics: A Plan for the 1990's, Challenges for College Mathematics: An Agenda for the Next Decade,* etc.). Let me urge you to read and reread these books and then to act. The studies have been made, the recommendations formulated, and now it is up to us to *act.* Whether we agree or disagree with the recommendations formulated, our responsibility is to become involved, rather than sit on the sidelines. I personally believe that we need to change existing values concerning mathematics education in our own schools and in our own towns. For a starter, let me list spectrums on a few issues

- Class format: active student involvement in developing mathematics or passive lecture form?
- Testing: mechanical computational problems or written explanations and descriptions of reasoning?
- "Research": broadly defined concept of scholarship or publication in "respectable" journals?
- Technology: use it as a teaching tool or forbid its use?
- Precollege program: our concern or leave it to someone else?
- Standards: High tuition should buy a "comfortable course experience" or a demanding challenge?
- Preparation of teachers: our concern or leave it to someone else?

My request (i. e., plea) is for each of us to modify this list to fit our own situations, formulate position(s), and then express and act upon them. Department Chairs, Deans, parents, school board members, business leaders, etc. need to hear strong statements from us on how we view the importance of leaning and doing Mathematics.

Don Small
Colby College
Governor, NES/MAA

MINUTES OF THE LAST MEETING

The Spring Meeting of the Northeastern Section was held on June 8-9, 1990 at Roger Williams College in Bristol, Rhode Island. There were approximately 140 registrants.

Invited Addresses

What Should Be in an Introductory Statistics Course? by James M. Landwehr, AT&T Bell Laboratories.
The Five College NSF Calculus Project by Kenneth R. Hoffman, Hampshire College.
Self-Esteem in Mathematicians by Herbert Wilf, University of Pennsylvania & Editor, the *American Mathematical Monthly.*
Experimental Verification of Approximation Algorithms for Bin Packing by Catherine McGeoch, Amherst College.
Some Thoughts on Three Subjects: Mathematics Education, Sequential Choice and Economics by Daniel Kleitman, Massachusetts Institute of Technology.
Student-Sensitive Teaching: The Reasons for Potsdam's Success in Attracting Majors by Pat Rogers, York University.
Student Chapter Session: The Josephus Problem by Herbert Wilf, University of Pennsylvania & Editor, the *American Mathematical Monthly.*

Student Minicourse

Chaos, Fractals, and Dynamics: Computer Experiments in Mathematics by Robert L. Devaney, Boston University and Marilyn B. Durkin, Bentley College.

Contributed Papers

Computer-Assisted Mathematics Instruction at the University of Maine by Clayton W. Dodge, University of Maine.
The Use of BITNET in Teaching Numerical Analysis and Discrete Mathematics by Ronald W. DeGray, Saint Joseph College.
The Heart and the H-Vector by Parry Moon, Massachusetts Institute of Technology, Domina Eberle Spencer, Terri L. Mascardo and Irene N. K. Tan, University of Connecticut.
Application of the H-Vector to Four Sample Diets by Parry Moon, Massachusetts Institute of Technology, Domina Eberle Spencer, Terri L. Mascardo and Irene N. K. Tan, University of Connecticut.

Student Papers

Predicting Olympic Qualifying Times by Pattie Clapper, University of Maine.
Generalized Pythagorean Triples by Lisa Henkel, University of New Hampshire.
Sequences and the Analysis of Real Valued Functions of a Real Variable by Jon Milanczuk, Western New England College.
A General Approach to Absolute Value Problems by Frank Hubeny, University of Maine.

Budapest Semesters in Mathematics by Andrew Erman, Rutgers University.
Use of Fractals as a Basis for Image Compression/Reconstruction by Leon Brin and Kevin Gorman, Western New England College.
Math Modeling for Faster Typing by Alexander N. Brin, University of Massachusetts.
Fascinating Fractals by Tammy L. Harkins, Kasey L. Heller and Susan Kleckner, Cedar Crest College.
Fractal Foray by Stephanie A. Stein and Carol E. Kobayashi, Cedar Crest College.

At the business meeting acknowledgement was given of the support that the section has received through an Exxon Educational Foundation grant to encourage increased participation of student chapter members in the sectional meetings. This grant helped to fund the minicourse and other student activities at this meeting. Requests were made for suggestions for speakers for a regional minicourse and for volunteers for the committee on regional dinner meetings as well as for program committees for future meetings. The chairperson thanked Donna Beers of Simmons College and her committee for their work on the excellent program and John O'Connell of Roger Williams College for his help in local arrangements. The assistance of Malcolm MacGregor of Massachusetts Maritime Academy in video taping the student short course was gratefully acknowledged. Recognition was given in the form of a certificate, a book award and a year's membership in the MAA to the students who presented papers at the meeting.

Laura L. Kelleher
Massachusetts Maritime Academy
Secretary-Treasurer NES/MAA

PRIMUS

A new journal, **PRIMUS** - *Problems, Resources, and Issues in Mathematics Undergraduate Studies*, is a forum for the exchange of ideas on teaching and learning mathematics at the college level. **PRIMUS** is a refereed quarterly, devoted to dialogue and exchange of ideas among those interested in undergraduate mathematics.

The journal will be published in March, June, September and December of each year. Volume I, Number 1 is the March 1991 issue. Each issue contains 96 pages of relevant and worthwhile material for those interested in collegiate mathematics education. Annual subscription rates are $34.00 US per year. Contact:

PRIMUS
Rose-Hulman Institute of Technology
Terre Haute IN 47803 USA.
(812)-877-8412
BITNET: WINKEL@ROSEVC.ROSE-HULMAN.EDU.

NES/MAA IN THE 60'S

The 1960's was a period of upheaval and search for direction in education as well as in politics. "New math" was in vogue in the classroom. Students began the decade with slide rules and ended it with hand-held calculators. Graph-theoretic attempts to discover a contradiction to the four-color theorem were in style. The impact of computers in the educational system was just beginning to be felt. In 1963, Walter Feit and John Thompson showed that every noncyclic simple group of odd order is solvable. That same year, Michael Atiyah and I. M. Singer established the index theorem in K theory, of which the Riemann-Roch theorem is a special case. The Fields Medals that decade went to Lars Hormander, John Milnor, Michael Atiyah, Paul Cohen, Alexander Grothendieck and Stephen Smale.

Throughout the turbulent period the NES/MAA remained stalwart in its direction and purpose. The format at the meetings remained relatively constant, and the attendance at the meetings during that period averaged approximately 100. Meetings were held in almost every New England State (New Hampshire being the exception) and in Canada as well. The historic 1967 spring meeting was held at Mount Allison University in Sackville, New Brunswick.

There were relatively few changes in the Section by-laws during the decade. In 1960, the by-laws were amended to make the sectional Governor a member of the Executive Committee, and to institute a $1 registration fee at the annual meeting if the Executive Committee felt that such a sum was necessary to offset the expenses of a business meeting. In 1967, the Executive Committee was given the authority to award a one-year membership in the Association to individual students in the Northeastern Section ranking highest in the Putnam Mathematical competition. Two years later the first such award was given to S. K. Winkler of the Massachusetts Institute of Technology.

During the 60's the NES/MAA was guided by some of the most well-known and respected mathematicians in the world. The sectional Governors were F. M. Stewart (Brown University), D. E. Richmond (Williams College) Howard Eves (University of Maine) and Grace Bates (Mount Holyoke College). During this period, the Chair was occupied by John Kemeny (Dartmouth College), H. S. Dorwart (Trinity College), Grace Bates, Hartley Rogers (Massachusetts Institute of Technology), Robin Robinson (Dartmouth College), G. L. Spenser (Williams College), W. H. Crawford (Mount Allison University) and Michael Gemignani (Smith College). The position of Secretary-Treasurer was held by R. S. Pieters, until he was succeeded in 1965 by George Best, both from Phillips Academy. Furthermore, R. A. Rosenbaum served as Second Vice President of the Association from 1961-63 and from 1965-67. He also served as Editor of the Monthly from 1967-71. Howard Eves and John Kemeny served as Governors-at-Large for the Association, Eves from 1958-60 and Kemeny from 1960-62.

The group of invited speakers during the 60's was exceptionally outstanding. Many of the officers of the Section gave presentations themselves and the list of invited lecturers who were not officers of the section included: R. H. Bing (President of the Association 1963-64; AMS President, 1977-78), Wistar Comfort, Phil Davis, William Duren, Howard Eves, D. J. Foulis, Vincent Haag, Einar Hille (AMS President 1947-48), G. Hocking, Ken Ireland, Mark Kac (AMS Gibbs Lecturer, 1967; AMS Birkhoff Award, 1978), Shizuo Kakutani, Kenneth O. May (Governor-at-Large of the Association 1964-65), Edwin Moise (President of the Association from 1967-68), J. R. Munkres, Oystein Ore, Gian-Carlo Rota (AMS Steele Award, 1988), Alice Schafer, I. M. Singer (AMS Bocher Memorial Award, 1969), Ernst Snapper, Laurie Snell, Norton Starr, R. J. Walker (Second Vice President of the Association 1967-68). Professors Kemeny, Moise and Walker spoke twice before the Section in the 60's.

The 60's was a time of great hopes and achievements as well as a time of contradictions and bitter disappointments. It gave us the New Frontier, the Great Society, the Vietnam War, the Beatles, Woodstock, the Apollo missions to the moon and probes to the other terrestrial planets. Members of the NES/MAA made notable contributions to the changes that occurred in the decade and helped us usher in the 70's.

J. J. Tattersall
Providence College
Historian-Archivist NES/MAA

THE HOWARD EVES' 80th BIRTHDAY CONFERENCE

The **Howard Eves' 80th Birthday Conference on History, Geometry and Pedagogy** will be held at the University of Central Florida in Orlando, Florida on May 9-11, 1991.

Howard Eves' career interests in teaching, history and geometry provide an ideal setting within which mathematics teachers and university professors can discuss their experience and research. It is fitting tribute in the year which marks the 80th anniversary of Howard Eves' birth that a conference be organized which brings together representatives of these diverse groups to discuss their common interest so that each can learn the perspectives of the others. Keynote Speakers will include Professors Clayton Dodge, Peter Hilton, Bruce Meserve, Fred Rickey, Marjorie Senechal and, of course, Howard Eves. There will also be parallel sessions for contributed papers and workshops.

For more information concerning the conference address all inquires to the Conference Director:

Professor Joby Anthony
Departments of Mathematics
University of Central Florida
Orlando FL 32816-6990

Telephone: (407)-823-2700 or Fax: (407)-281-5156.

ANOTHER DOUBLE DELIGHT: THE 1990 SHORT COURSE

Modeling a car suspension system played a prominent part in the twelfth annual NES/MAA-University of Maine short course, taught by Frank Giordano and Chris Arney of the U. S. Military Academy at West Point. Maurice Weir of the Naval Postgraduate School in Monterey also had planned to teach the course, but was unable to come this year. Frank did most of the lecturing and Chris presented computer examples and taught the afternoon computer lab sessions. The course was based on the forthcoming differential equations text by Giordano and Weir, to be published by Addison-Wesley. By returning to the same familiar problems, such as a car's suspension system, students motivate new methods as they generalize their models. Modeling real problems is the heart of the course.

Derive, **Calculus Toolkit**, and **MDEP** were used in the afternoon computer sessions to solve and simplify differential equations. Participants gained considerable skill in the use of the software. The Tuesday evening session consisted of demonstrations of three software programs, two interesting chaos and fractal programs and a set of graphing programs.

The midweek break included the usual Wednesday trip to Mount Desert Isle for an afternoon of sightseeing and hiking. Two smaller groups split off, one to climb Mount Katahdin and the other to play golf on the Bangor Municipal course. Unfortunately both the mountain climbers and the golfers were drenched by thunder storms. All gathered in the Student Union for our annual Pat's Pizza party and Don Small's curriculum discussion, augmented with a demonstration of some advanced graphics on a 386 computer by Paul VanSteenberghe.

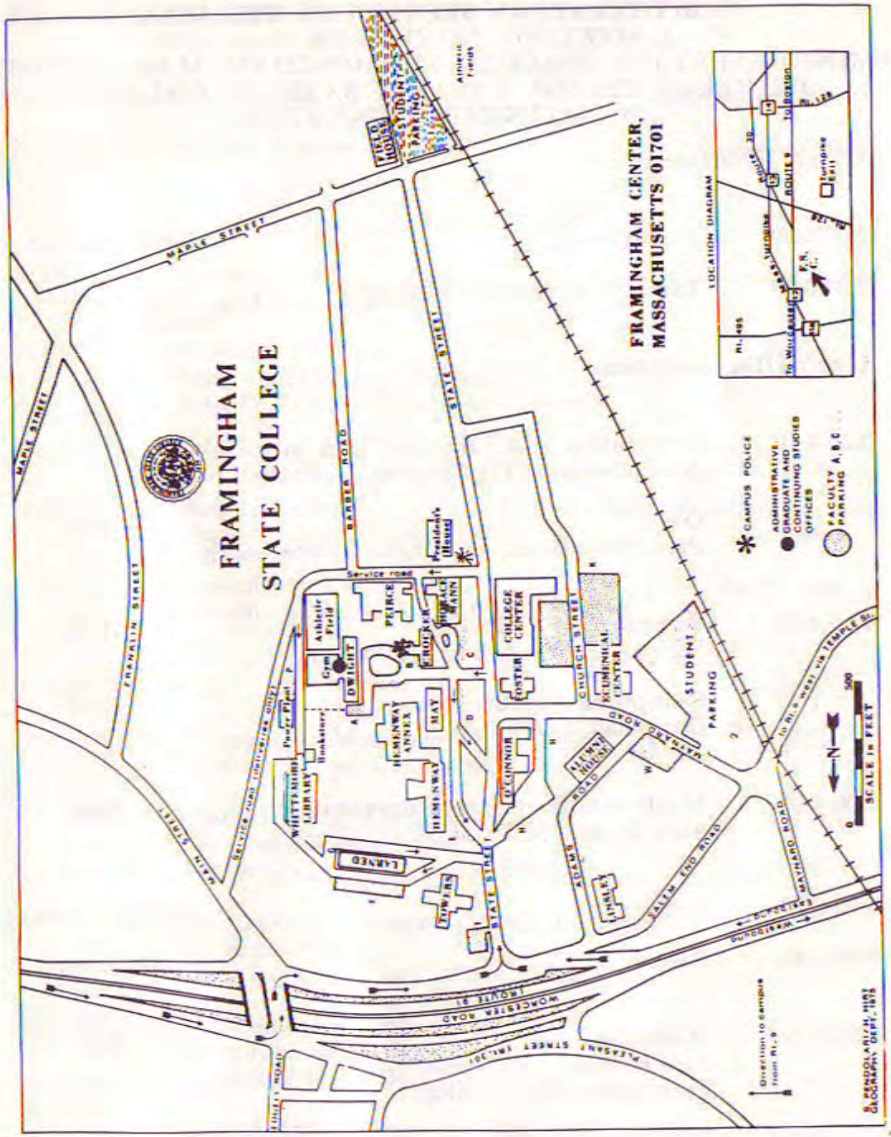
The Thursday evening steak and lobster banquet climaxed the social events of the week. A description of mathematics education in the Soviet Union by visiting Professor Boris Kolodyazhny produced many questions from the group and helped to complete another great short course.

For 1987 and 1988, on a budget of approximately $10,000 a year, the short course accumulated a total deficit of some $17. The large attendance in 1989 erased the deficit and left a surplus of about $1600. Figures for 1990 will be available later this year. Participant cost this year was $265 or $285, depending on accommodations, for 5 days of lectures, 5 nights lodging, and 14 meals. Watch for the announcement of next year's lecturer.

Clayton W. Dodge
University of Maine

NES/MAA TRIVIA

(These questions appeared without answers in the fall newletter.)
1. What school has hosted the most meetings of the Section? Answer: a tie with Merrimack College and the University of New Hampshire each having hosted three.
2. Who has been invited most often to speak at NES/MAA meetings? Answer: Howard Eves (5).
3. Which school has provided the most invited speakers for our Section meetings? Answer: A tie between Dartmouth and MIT (11) with Harvard a close third (10).



NORTHEASTERN SECTION OF THE MAA
FALL MEETING: NOVEMBER 16-17, 1990
FRAMINGHAM STATE COLLEGE, FRAMINGHAM, MASSACHUSETTS
PROGRAM THEME: *A YEAR OF NATIONAL DIALOGUE ON MATHEMATICS EDUCATION*

Friday, November 16

2:00-6:00	Registration	Hemenway Lobby
2:30-3:30	Executive Committee Meeting	HA 113

Lectures/Demonstrations

3:30-4:10	**Integrating MATHEMATICA into Calculus** Alan Shuchat & Fred Schultz, Wellesley College	H309
	On C^{++} Peter Rosenbaum, Framingham State College	H126
4:15-4:55	**Software for Calculus** Barbara C. Nevils, Bentley College	H126
	Computer Algebra Systems Don Small, Colby College	H309
5:00-6:00	**Mathematics of Fair Representation** Alan Tucker, SUNY at Stony Brook	H309
6:00-6:30	Social	Fireplace Lounge
6:30-7:45	Banquet	1839 Room
7:55-8:00	**Welcome** Paul F. Weller, President Framingham State College	H309
8:00-9:00	**Mathematically Motivated Design** Howard Eves, University of Maine (Professor Emeritus)	H309
9:00-10:00	Reception	Fireplace Lounge

Saturday, November 17

8:00-10:30	Registration	Outside the Forum
8:00-9:15	Student Papers	College Center
9:15-10:15	**Self-Dual Polyhedra** Dan Archdeacon, University of Vermont	The Forum
10:15-10:45	Coffee Break Tour of Book Exhibits	Outside the Forum
10:45-12:00	**Christie Lecture** **Mathematics and Games** John H. Conway, Princeton University	The Forum
12:00-12:30	Business Meeting	The Forum
12:30-1:30	Buffet Luncheon Student Swap Session	1839 Room & Commuter Cafe The Pub
1:45-2:45	**Disorderly Patterns** Marjorie Senechal, Smith College	The Forum

Invited Short Talks

3:00-3:45	**A Look at Geometric Probability** Martin Badoian, Canton High School	CC511
	Mathematics, Computers and the Human Condition Robert Oberg, Wang Laboratories, Inc.	CC513
	Humanistic Mathematics & Its Impact on High Schools Mary Sapienza, Newton North High School	CC518
3:45-4:25	**Mathematics Education: International Perspectives** Carol R. Findell, Boston University	CC511
	MSL (Mathematics as a Second Language) Herb Gross, Bunker Hill Community College	CC513
	Modeling AIDS for College Classroom Use Sonja Sandberg, Framingham State College	CC518
3:00-4:25	Contributed Papers	CC

Key: HA = Hemenway Annex, H = Hemenway, CC = College Center

PROGRAM COMMITTEE

Thomas Moore, Bridgewater State College, Co-Chair
Kenneth Preskenis, Framingham State College, Co-Chair
Sally Barney, Massasoit Community College
Thomas Koshy, Framingham State College
John Smith, Boston College
Ronald Tannenwald, Southeastern Massachusetts University

LOCAL ARRANGEMENTS COMMITTEE

Thomas Koshy, Chair
Alfred Brown, Anita Goldner
John Lewis, Sonja Sandberg
Ann Sevin

ABSTRACTS/SPEAKERS

Integrating MATHEMATICA into Calculus

Alan Shuchat & Fred Schultz, Wellesley College

Many mathematics courses at Wellesley College now make use of Macintosh computers, and employ **MATHEMATICA** as well as several smaller-scale programs. We will describe our new Mathematics Graphics Classroom and demonstrate Calculus Menus, a front-end program we are developing that allows students to use **MATHEMATICA** without having to learn its formidable syntax. Calculus Menus is written in SuperCard and employs menus and dialog boxes rather than **MATHEMATICA**'s command-line structure.

Alan Shuchat received his S. B. from Massachusetts Institute of Technology and his M. S. and Ph. D. from the University of Michigan at Ann Arbor. His advisor was M. S. Ramunujan where he worked in functional analysis. He has also done research in operations research and is currently Associate Dean and Professor of Mathematics at Wellesley College.

Fred Schultz received his B. S. from the California Institute of Technology and his Ph. D. from the University of Wisconsin at Madison. His thesis work was in the area of axiomatic quantum mechanics and his advisor was Dietrich Uhlenbrock. He has worked in convexity theory and operator algebras. He is currently exploring the relationships between dynamical systems and operator algebras. He has been at Wellesley since 1972.

On C^{++}

Peter Rosenbaum, Framingham State College

This presentation will include an overview of C^{++} and an introduction to Borland's new Turbo C^{++}compiler. There will be a discussion of the three fundamental concepts of 00P - data abstraction, inheritance, polymorphisms - using a simple example.

Peter Rosenbaum earned his Ph. D. from Massachusetts Institute of Technology in Mathematics. He is currently Chairman of the Computer Science Department at Framingham State College and has many years of industrial experience including work for Data General and Control Data.

Software for Calculus

Barbara C. Nevils, Bentley College

The workshop will begin with a brief overview of several of the currently available calculus software packages for the IBM computer. The participants will have "hands-on" time with many of the packages. Sample assignments using some of the software will be available for distribution.

Barbara Nevils received her B. S. from the University of Massachusetts at Amherst, and her M. A. from Tufts University, after which she taught at Reading High School for 7 years. She has been at Bentley College for the past 12 years and has for the past 5 served as Software Computer Consultant for the Department of Mathematical Sciences there. She prepares software and also assignments for students in the required calculus courses to be used at the discretion of the individual teachers. There are presently 2000 students enrolled in the calculus sequences at Bentley College.

Computer Algebra Systems

Don Small, Colby College

Computer algebra systems (CASs) are being accepted as primary tools for implementing objectives of the calculus reform program. These systems will change both what we teach and how we teach. More importantly the use of CASs as teaching tools will help us focus on student learning rather than on instructor teaching. In this talk, I will illustrate and discuss a few implications of using CAS in teaching calculus.

Don Small received his B. A. from Middlebury College, M. A. from the University of Kansas and his Ph. D. from the University of Connecticut. He is presently serving his second term as Governor of NES/MAA, has served as Chairman of the Section and has served as co-director of the Section's annual short course since its inception in 1979. In recognition of his many contributions to the mathematics community, he was awarded The MAA Certificate of Meritorious Service in 1987. He is interested in graph theory and CAS and is one of the leaders of the current calculus reform movement.

The Mathematics of Fair Representation

Alan Tucker, SUNY at Stony Brook

This talk will discuss two mathematical problems concerning the division of a contested resource. The first is over 3000 years old and originally arose when three wives fought over the estate of their dead husband. The second is only 200 years old and involves the allocation of seats among states in the U. S. House of Representatives; a recently proved impossibility theorem shows that a "fair" allocation procedure cannot exist in all cases.

Alan Tucker was awarded his A. B. from Harvard University and his Ph. D. from Stanford University where he studied under George Dantzig. He holds the position of SUNY Distinguished Teaching Professor. He is not a stranger to the NES/MAA having presented two short courses at the University of Maine as well as having spoken at previous section meetings. He is well known in the field of curriculum development in the areas of discrete mathematics and linear algebra. He recently stepped down as First Vice-President of the MAA.

Mathematically Motivated Design
Howard Eves, University of Maine (Professor Emeritus)

A look-see into a collection of unusual and attractive designs (for furniture, jewelry, lamp shades, blankets, quilts, patios, foyers, flower gardens, scarves) originating in certain mathematical problems and puzzles.

(The following is excerpted from the biographical sketch of Howard Eves which was written by Clayton Dodge of the University of Maine and appeared in the Fall 1989 issue of this Newsletter.)

"His talks will hold an audience spellbound whether he addresses high school students, undergraduates, or mathematics faculty." So states a recent University of Central Florida flier advertising a lecture series by Howard Eves. He obtained his B.S. from the University of Virginia in 1934 and his M.A. from Harvard the next year, both in mathematics. He did further study at Princeton University during the next two years, and received his Ph.D. in mathematics from Oregon State University in 1948. After his stint at Princeton, Howard worked as surveyor for a year and as a mathematician for the Tennessee Valley Authority for another year. Then he went into teaching at Syracuse University 1940-1943, at the University of Puget Sound 1943-44, where he was head of the department, Oregon State University 1944-51, SUNY at Plattsburgh 1951-53, again as department head, SUNY at Binghamton 1953-54, and the University of Maine 1954 up to his retirement in 1976. Since retirement he has taught at the University of Maine at Machias and currently he teaches each spring at the University of Central Florida. Howard Eves has published well over 30 books and 200 papers and articles, many in geometry. His book on the history of mathematics has been the best seller in its field ever since its initial appearance in 1953. Ten years later he published his authoritative *A Survey of Geometry* in two volumes. His *Mathematical Circles* books, published by Prindle, Weber & Schmidt in six volumes from 1969 to 1987, form an outstanding collection of anecdotes and stories about mathematics and mathematicians. Of a more serious nature are his two *Great Moments in Mathematics* books, a collection of 43 lectures describing important developments in mathematics from the proof of the Pythagorean theorem to the resolution of the four color problem.

Self-dual Polyhedra
Dan Archdeacon, University of Vermont

Duality relations among polyhedra have been a topic of fascination for thousands of years. Particularly intriguing are polyhedra which are isomorphic to their duals, such as the tetrahedron. In this talk I survey recent results in self-dual polyhedra. I discuss a complete set of six constructions for self-dual polyhedra. I also give several constructions for self-dual polyhedra on arbitrary surfaces.

Dan Archdeacon received his A. B. from Earlham College and his M.S. and Ph. D. from The Ohio State University where his advisor was Henry Glover. His thesis was entitled "A Kuratowski Theorem for the Projective Plane". He recently authored a series of papers on self-dual graph imbeddings.

The Christie Lecture: Mathematics and Games
John H. Conway, Princeton University

I will talk about how the idea of combining games leads to some interesting mathematics; and in particular, to a new notion of number. There are also connections with group theory and with error correcting codes.

John H. Conway has had a long connection with Cambridge University having received his undergraduate and graduate degrees there. His mentor was Harold Davenport. He then continued on as a professor at Cambridge. Presently he is the John Von Neumann Professor at Princeton University. He has worked in number theory, set theory, group theory and more recently geometry.

Disorderly Patterns
Marjorie Senechal, Smith College

Although the word pattern implies orderliness, some of the most interesting patterns being studied today are disorderly to some degree. In this talk, I will discuss some of the intriguing math problems posed by the disorderly pattern known as "quasicrystals".

Marjorie Senechal received her Ph. D. from the Illinois Institute of Technology in 1965. She is presently the Lewis Wolff Kahn Professor of Mathematics at Smith College. Prompted perhaps by her childhood fascination with patterns and weavings, her main research interest has been mathematical crystallography, a field that is a meeting ground for the geometry of numbers, tilings, lattices, polytopes and discrete groups. She is currently writing a book on quasicrystals. Her nonprofessional interests include eclectic reading, hiking and cycling, and talking on the phone with her two grown daughters. The loom stands unused in a corner, but she hopes to weave again if she can ever find the time.

A Look at Geometric Probability
Martin Badoian, Canton High School

During the session we will examine a variety of problems with varying degrees of difficulty which make use of "geometric probability" in order to arrive at a comfortable solution. By the way "what is geometric probability"?

Martin Badoian received his B. A. at Brown University, his M. ED. at American International College and has done further graduate work at Fordham University, Boston College and Bridgewater State College. He was named State Teacher of the Year in 1977 and was a Presidential Award winner in 1974. He has directed the Canton High School MATH TEAM to ten consecutive state and New England titles.

Mathematics, Computers and the Human Condition
Robert Oberg, Wang Laboratories

This talk will explore the questions:
-- What has mathematics to do with the human condition?
-- What is the meaning of my life, as a mathematician?

and the similar questions for computer science. G. H. Hardy provided one answer for pure mathematics -- that while it is not "useful", it is not "harmful". The same cannot be said for computers -- they have both positive utility and also definite potential for harm.

Two main themes will be developed. The first relates primarily to the applications of computer science and concerns the ideas of Gandhian economics, taking a lower-technology approach to world development. The second theme applies to mathematics, and indeed to any discipline. We will look at the "spiritual" dimension of mathematics and try to understand mathematics as a meditation.

Time will be allotted for free discussion of these ideas and concerns.

Robert Oberg earned his Bachelors degree from the University of California at Berkeley and his M. A. and Ph. D. from Harvard University where his advisor was Andrew Gleason. He then taught at Knox College, Wharton School of Finance at Commerce at the University of Pennsylvania and Framingham State College. For the last eight years he has worked in the computer industry (Prime Computers and Wang Laboratories) in the areas of CPU, Architecture, software development and distribution systems.

Humanistic Mathematics & Its Impact on High Schools

Mary Sapienza, Newton North High School

The talk aims to frame some key questions that teachers are pondering as they begin to re-examine the high school mathematics program and to explore mathematical connections that will allow students to experience the subject as a truly human endeavor.

Mary Sapienza received her A. B. from Emmanuel College and her M. A. from Columbia University. She has taught high school for 24 years and is presently Mathematics Department Head at Newton North High School. She has supervised student teachers from Brandeis University and Boston College and has taught courses for aspiring mathematics teachers.

Mathematics Education: International Perspectives

Carol R. Findell, Boston University

Several national and international studies have gathered data on the mathematics achievement level of students in the United States and other countries, notably South Korea, China and Japan. This talk will focus on differences in achievement as well as pedagogical differences in mathematics education in these countries. Ramifications for the future of mathematics education in the United States will be discussed.

Carol Findell has a B. A. and an M. S. T. from the University of New Hampshire and a Doctorate in Mathematics Education from Boston University where her mentor was Carol Greenes. She brings a very broad view to mathematics education since she has taught at all levels from pre-school to higher education. She is currently training future high school and elementary school teachers. She also runs in-service work shops for teachers of mathematics.

MSL (Mathematics as a Second Language)

Herb Gross, Bunker Hill Community College

Not everybody who has trouble reading has dyslexia; not everyone who hates his job has "burnout"; and not everyone who has trouble with mathematics has "math anxiety". In fact, the main thrust of this talk will be to show that most people who suffer with "innumerancy" do not have "math anxiety" but rather have a language problem. In particular the talk will stress the advantage of viewing numbers as adjectives. The truth of a statement as simple as $3 + 2 = 5$ requires that we view 3, 2 and 5 as adjectives modifying the same noun. For example: $\underline{3}$ dimes + $\underline{2}$ nickels = $\underline{40}$ cents. This relatively simple observation allows us to replace any fraction problem by a less complicated whole number problem.

Currently Professor of Mathematics at Bunker Hill Community College and the Senior Lecturer at the M. I. T. Center for Advanced Engineering Study, Herb Gross has been a motivating force in the two-year college movement since 1958 when he became the founding chairperson of the mathematics department of Corning (NY) Community College. His many years of dedication to the community college concept and his unique contributions in the area of educating non-traditional students lead to his being named "Outstanding Faculty Member" by the Association of Community College Trustees in 1986.

Modeling AIDS for College Classroom Use

Sonja Sandburg, Framingham State College

There is great interest in understanding the AIDS epidemic. Mathematics covered in undergraduate courses can be used to gain understanding. In this lecture, two models for the AIDS epidemic will be presented. The first model predicts the future course of the epidemic in a population. This model is described by a system of non-linear differential equations. The second model is a probability model and describes an individuals risk of acquiring an HIV infection as a function of the person's behavior.

Sonja Sandberg is Associate Professor of mathematics at Framingham State College. She received her S. B. from Massachusetts Institute of Technology in 1966 and her Ph. D. from the University of Texas Health Science Center at Dallas in 1981. Her research interests are mathematical models of epidemics and decision making in medicine.

CALL FOR CONTRIBUTED PAPERS

There will be contributed paper sessions at the both spring and fall meetings. We are specifically interested in papers pertaining to new courses which you have developed, successful techniques you have found useful in teaching, or research you have done related to your classroom material. We urge you to make a presentation and to let others know what you are doing. This is also a good time to start planning a presentation for the Spring Meeting. Your presentation should be approximately 15 minutes in length. Send a typed abstract, together with a list of any special equipment you may need, by Wednesday, November 7 to: Ed Sandifer, Department of Mathematics and Computer Science, Western Connecticut State University, Danbury CT 06810. Telephone (203) 797-4310 or BitNet at SANDIFER@CTSTATEU.

ACCOMMODATIONS

A block of 50 rooms has been reserved at the Natick Hilton for the Fall Meeting. It is about 10 minutes from Framingham State College. For reservations, complete the form below and mail it to the Natick Hilton. Note: the ZIP code is 01760.

Here are a few additional hotels and motels which are within 10 minutes of the College:

Framingham Treadway Inn	Tel.	508-872-6503
Howard Johnson Motor Lodge		508-872-8811
Red Roof Inn		508-872-4499
Sheraton Tara Hotel		508-879-7200

NATICK HILTON

Speen St. and Rt. 9, Natick, MA (508)653-5000

RESERVATION FORM

Mathematics Association

NAME OF GROUP: Framingham State College

DATE: November 16-17, 1990

ARRIVAL DATE:_____ ARRIVAL TIME:____

DEPART. DATE:_____

ALL RESERVATIONS MUST BE ACCOMPANIED BY FIRST NIGHT'S DEPOSIT OR A MAJOR CREDIT CARD NUMBER TO GUARANTEE THE ROOM FOR LATE ARRIVAL.....

CREDIT CARD NAME:_____ #_____

EXPIRATION DATE:_____

YOUR NAME:_____

SHARING WITH:_____

ADDRESS:_____

street city state zip

TEL. # WORK:_____ TEL. # HOME:_____

*ACCOMMODATIONS REQUESTED:_____ 1 BED_____ 2 BEDS____ STUDIO____

*SPECIAL REQUESTS:_____ NON SMOKING_____ HANDICAP_____ OTHER_____

RATES: $65.00 1 person
2 persons

$10.00 per extra person and/or cot

MASS. ROOM TAX 9.7%

TO ASSIST US IN ACCOMMODATING YOUR GUEST ROOM REQUEST, PLEASE FOLLOW THESE GUIDELINES:

A) Group reservation requests will be accepted until 11/2/90 . *
B) Check-in time is after 3:00 p.m. and check-out time is by 12 Noon.
C) Only one reservation card necessary per room...

SIGNATURE:_____

*all accommodations and special requests are subject to availability.

CALL FOR STUDENT PAPERS

Students (and recent graduates) from the Northeastern Section are invited to present papers at the Fall Meeting on topics in mathematics, statistics, or computer science. The presentations will be 15 to 20 minutes in length, on either expository work, research projects, employment experiences, or problems from math periodicals. Prizes will be awarded and the fees for registration and meals will be waived for **one** student presenter per paper at the Fall Meeting.

Almost every college/university has students working on projects, problems, and minor mathematical research. The success of a student paper session depends primarily on faculty members identifying prospective papers, encouraging their students and arranging departmental financial support when possible. If there are no potential student papers on your campus for the Fall Meeting, we urge you to initiate student projects now for presentation at the Spring Meeting.

Interested students should send an abstract and current address, with phone number, by Wednesday, November 7 to: Joseph C. Witkowski, Department of Mathematics and Computer Science, Keene State College, Keene NH 03431. Telephone (603) 352-1909. All proposals will be reviewed by department faculty members.

STUDENT CHAPTERS: SPECIAL PROGRAMS

There will be two special programs for the MAA Student Chapter members at the upcoming Fall Meeting at Framingham State College. First, Professor Clayton Dodge, University of Maine, will give a special presentation especially for students. The title of his talk is "The Twin Circles of Archimedes: Are they Really Twins?" Professor Dodge is well known for his ability to present fascinating problems in a manner that enlightens, informs and challenges. His talk will be on Saturday. Upon registration be sure to check your program for when and where. Don't miss it! Second, there will be a "Swap Session" for Student Chapter members and advisors during lunch on Saturday. We have set aside a special room for this. Again, upon registration be sure to check your program for when and where. We will "swap" program ideas, successful projects, dismal failures, etc. All student chapter members are welcome and encouraged to attend. Pick up your lunch in the dining area and follow directions to the special room. We will have a "working" lunch.

SPECIAL NOTE: **One** representative per student chapter of the NES/MAA will be given free registration and Saturday lunch for the Fall Meeting. Please note on your registration form if you are your chapter's designated representative. Also, student chapter advisor's should notify Thurmon Whitley (address below) of the name of your chapter's designated representative to the meeting.

STUDENT CHAPTERS: NEW CHAPTERS

As of September, 1990, there are 19 Student MAA Chapters in the NES/MAA. Most of these were enrolled as Charter Chapters at the 75th Anniversary Meeting of the MAA this past summer in Columbus, Ohio. However, new chapters can be formed at any time. If you need information on how to go about doing so, contact: Thurmon Whitley, Department of Mathematics, University of New Haven, West Haven CT 06516. Phone (203)-932-7296.

DIRECTIONS TO FRAMINGHAM STATE COLLEGE

Framingham State College is located in Framingham Centre near Route 9, approximately 2 miles west of *Shopper's World*. It is midway between Exits 12 and 13 on the Massachusetts Turnpike.

FROM THE WEST:

Take the Massachusetts Turnpike to Exit 12, Framingham-Marlboro. Follow the signs for Route 9 East and Framingham. The College is about 2 miles east of this exit. Follow Route 9 to the "Edgell Road - Main Street - Framingham" off ramp. DO NOT TAKE THE UNDERPASS. Take the first right onto State Street. The main entrance of the campus is on the left side of State Street. Refer to the campus map on Page 9 for location of buildings.

FROM THE EAST:

Take the Massachusetts Turnpike to Exit 13. Follow Route 30 West - Framingham. Stay on Route 30 until it intersects with Route 9 (about 1 mile). Follow Route 9 West to the "Framingham - Southborough" off ramp. DO NOT TAKE THE UNDERPASS. At the lights, take a left turn over Route 9. Take the first right then the first left onto State Street. The main entrance to the campus is on the left side of State Street. Refer to the campus map on Page 9 for location of buildings.

FROM THE NORTH OR SOUTH VIA I-495:

Exit I-495 onto Route 9 East - Framingham. Follow the directions given for those coming from the west. The College is about 7 miles east of I-495.

NEWS FROM NEMATYC

This year's meeting of the New England Mathematics Association of Two-Year Colleges will be hosted by Massasoit Community College on March 9, 1991. If you are interested in making a presentation at this meeting contact: Jack Keating, 1 Massasoit Boulevard, Massasoit Community College, Brockton MA 02402. (508)-588-9100 x215

EDITOR'S MESSAGE

Friday, March 15, 1991 is the date by which all material for inclusion in the SPRING 1991 issue of the newsletter must be in the hands of the editor; see the inside front cover for the address.

In case you missed it, an article entitled "A Message from the Chair" written by Dennis Luciano of Western New England appeared in the June 1990 issue of FOCUS. This article is based on two of his messages to this Section which appeared in the Spring and Fall 1989 issues of this newsletter while he was serving as Chairman.

Thanks to all contributors to this issue for their timely and well written news. A special thanks to J. J. Tattersall of Providence College for supplying the answers to the trivia questions which appear on page 8. A question which we have speculated on but to which we have no answer is "Who has attended the most meetings of the NES/MAA?". If you have any thoughts please pass them on to either of us. I would also like to thank Laura Kelleher for her invaluable assistance in the preparation and mailing of this issue.

PRE-REGISTRATION FORM

FALL MEETING OF THE NORTHEASTERN SECTION-MAA

NOVEMBER 16-17, 1990 **FRAMINGHAM STATE COLLEGE**

Mail Registration Form to: Thomas Koshy
Department of Mathematics
Framingham State College
Framingham, MA 01701

Checks should be made out to: **NES/MAA**

You may register at the meeting if you wish; however, it would facilitate the organization of the meeting if you pre-register and it will save you money in that on site registration fees are five dollars more than preregistration fees. In any case, meals cannot be guaranteed unless reservations are received by Monday, November 5, 1990. Spouses and guests are welcome at both meals.

REGISTRATION:

Name _____

Institution _____

Address _____

City, State, Zip _____

Telephone (O) ( ) _____ (H) ( ) _____

PRE-REGISTRATION FEE:

MAA Member ($10.00)
Non-member ($15.00)
Student or unemployed ($5.00) } $_____

MEALS:

Banquet 6:30 p.m. Friday
Chicken Veronique ( ) @ $15.00
Mushroom Quiche ( ) @ $15.00 } $_____

Buffet Lunch 12:30 p.m. Saturday ( ) @ $10.00 $_____

TOTAL $_____

☐ Please check if you plan to attend the student-chapter swap session at 12:30 p.m.

☐ Please check if you are a student-presenter.

See page 18 for information regarding lodging.

Northeastern Section MAA
Department of Basic Sciences
Massachusetts Maritime Academy
P.O. Box D, Buzzards Bay, MA 02532-1803

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