NEWS FROM THE CHAIR

It's hard to believe that my first three-year term as Chairman will be completed at the end of August. I want to take this opportunity to thank everyone in the Department for making the experience a pleasure. In 1992, after being nominated to take over from Ken Gross, I said that this was one of the few departments where I would even consider being Chairman. Today, I hold this sentiment even more deeply. The strength of this Department is its people. I've never known a Department where everyone contributes so much to the common good, gets along so well, and shows such respect for the professional interests of colleagues.

As I look back over the last three years, I see a number of accomplishments. We have maintained our commitment to excellence in teaching undergraduates at all levels. Curriculum development aimed at keeping our undergraduate courses, particularly our Calculus sequences, at the cutting edge of instruction, continues to be actively pursued. At the same time, our graduate programs continue to expand and thrive. We should soon be granting the first Ph.D.'s from our new degree program in Mathematical Sciences. Such vital graduate programs would not be possible without strong research groups. Recent grant activity makes it clear that our research groups in analysis, algebra and number theory, combinatorics, and biomedical mathematics have achieved national and international recognition. And, of course, there is the strong professional and community service component contributed by our faculty. I do not think that it is an exaggeration to say that this Department exemplifies the best traditions of academic life.

The next three years will be challenging as the University, our colleagues and the Department work under difficult financial constraints. However, with challenges come opportunities. I'm confident that we'll continue to move forward. Working together, even in hard times, there is much that we can do.

-- Bill Lakin

DEDICATION

GEORGE HUBERT NICHOLSON

An era of mathematics at UVM closed with the passing of George Hubert Nicholson on January 25, 1995. "Nicky", as we all knew him, was closely associated with UVM throughout one-third of its history. He was born in Prince Edward Island on March 12, 1898. At the age of 16 he was the principal and sole teacher of a one-room schoolhouse. At the age of 20 he went on to Mount Alyson College. He hoped to be given a Canadian scholarship for further work at a University, but preference was given to returning veterans. As a result, he attended Harvard to obtain a master's degree under the supervision of William Fogg Osgood in 1922. The following year, recruited by another Harvard graduate, Elijah Swift (later Dean of the College of Arts and Sciences), Nicky came to UVM. He stayed at UVM through the depression years and World War II, during which UVM's financial condition became so precarious that the local banks attached all the buildings on campus. Bankruptcy was averted when UVM became the official state university. In 1963, having reached the mandatory retirement age of 65, Nicky officially retired. Unofficially he continued to teach at UVM, St. Michael's College, Trinity College, Champlain College, and Plattsburgh Air Force Base. He finally retired in reality in 1973, at which time the home of the Mathematics Department at 41 South Prospect St. was renamed the Nicholson Building. Nicky continued to take an interest in UVM, though now devoting most of his time to his garden. His health remained good, though he suffered from respiratory problems occasionally, until the last few months of his life. With the death of his wife in September 1994 he seemed ready to depart himself. He remained cheerful until the very end and the day before he died told some friends who came to visit that he would be "going on a journey" the next day.

In his honor we dedicate this issue of the Newsletter.

-- Roger Cooke
WILLIAM CHAMBERLAIN.
PROFESSOR EMERITUS

-from College of Engineering & Mathematics
May 1995 Newsletter

Professor E. William Chamberlain retired from the Department of Mathematics and Statistics where he has been a valued member since 1962. Prof. Chamberlain graduated from Columbia University in 1955 and remained there for graduate study, receiving the Ph.D. in 1961. He taught for a short time at Middlebury College before coming to UVM. At Middlebury a student of his was Robert K. Wright, now teaching mathematics at UVM. Prof. Wright credits Dr. Chamberlain with motivating him to pursue a career in mathematics. Several of his UVM students, including Helen Read and William Karstens, are now teaching at UVM in mathematics and physics.

Prof. Chamberlain’s original field was ordinary differential equations, an area where he contributed, with Walter Strodt, to important advances in the asymptotic theory of second-order equations. More recently he has been interested in partial differential equations and numerical solutions. He has long had a lively interest in applications, including geodesy and the physics of stringed instruments, where he has used partial differential equations to model the vibrations of portions of violins.

Prof. Chamberlain was honored at a retirement party in the spring where his colleagues gathered to visit with him and wish him well. Many of his former students were present as well, and joined in the reminiscences and well-wishing.

UNIVERSITY SCHOLAR - KENNETH I. GROSS

-from the April, 1995 UVM RECORD

The University Scholars program annually recognizes four distinguished faculty members, two from basic and applied sciences and two from social sciences and humanities, for sustained excellence in research and scholarly activities. The scholars are selected by a panel of faculty members based upon nominations submitted by their colleagues. Each scholar receives a $1,500 research grant, and is invited to present a lecture on his/her work to the university community.

A recognition ceremony and reception in honor of the 1995-96 University Scholars was held at 4 p.m. on Wednesday, April 12, in Memorial Lounge, Waterman Building.

Kenneth Gross, professor of mathematics and statistics, received bachelor’s and master’s degrees from Brandeis University, and doctorate from Washington University. He joined the UVM faculty in 1987 and served as chair of the Department of Mathematics and Statistics from 1988-1992. Before coming to UVM, he served as program director for Modern Analysis at the National Science Foundation, and on the faculties of Tulane University, Dartmouth College and the universities of North Carolina and Wyoming.

He has edited three books and written numerous articles in the most prestigious journals in mathematics. His research interests include group representations and harmonic analysis, analysis on Lie groups and homogeneous spaces, special functions, Fourier analysis, and applications to physics and multivariate statistics. He has done seminal work in many of these areas, and is regarded as one of the world’s top experts in noncommutative harmonic analysis. Gross’s work has been funded continuously by the National Science Foundation since he received his doctorate, and he has received research support from many other foundations. One of his articles was awarded the Lester R. Ford Prize of the journal American Mathematical Monthly. This same article, “On the Evolution of Noncommutative Analysis”, later received the Chauvenet Prize from the Mathematical Association of America, the highest honor in mathematics for expository writing.

Gross is recognized by his colleagues and lauded by his students for his teaching at the graduate and undergraduate levels and for his educational interests and activities in areas including precollege mathematics education, teacher training and adult education. As department chair, he was instrumental in developing a doctoral program in mathematical sciences. In addition, he was co-founder of the Vermont State Mathematics Coalition, which addresses issues in mathematics and mathematics education from kindergarten through graduate study. A strong supporter of women and minorities in mathematics, his efforts toward diversifying the field of mathematical research were recognized in the Newsletter of the Association for Women in Mathematics at the time he left NSF.

SABBATICALS - 1995-96

Dan Archdeacon will be on sabbatical leave during the 95-96 academic year. While on leave he will continue his investigations into snarks. He plans to visit with colleagues Jozef Siran in Slovakia and Paul Bonnington in New Zealand.

Richard Foote also plans a sabbatical this year.
DEAR FRIENDS AND COLLEAGUES

Dan Zwick

As those of you who are not new this year know I am in the first year of a two-year leave from UVM in Bonn, Germany. I've been working hard here, although for the first four months we didn't have a place of our own but were staying with my wife's parents in their small apartment. All of our stuff was in storage, so we didn't have any of our winter things, and I didn't get my computer, my books, and my collection of papers until the middle of December. Fortunately, I bought a notebook computer and did a lot of work on that. Now I don't know how I ever got along without it! Also, I went in to the University of Bonn practically every day to work there. I was named an official guest member of the Sonderforschungsbereich, the research project housed here so I have a desk and can use the facilities, computer and so on.

After a long search we finally found a place we like, a house that is half of a duplex, which we are renting. It's on the other side of the Rhine from Bonn (referred to by Bonners as the "wrong side") and is far enough from the water so that we didn't get flooded out during the "flood of the century" in February. It's not our dream house, but we really like it and it's great to have a place of our own instead of a small room at Margret's parents' place. I now have a nice office at home with two computers (counting the notebook). Margret calls it an "executive office" since, for lack of space, we put a sofa in that room. It's a weird situation with the furniture—on the one hand we have too much since there are fewer rooms than in our old house, but on the other hand there are NO CLOSETS so we have no place to put our clothes and not much room to put kitchen and living room stuff either. In Germany it's expected that you bring your closets (cabinets, armoires) with you when you move so we are on the lookout for such things right now. We were lucky that the kitchen wasn't bare as it usually is when you move in, by which I mean no appliances, no counters, no fridge, no sink. The people who were here before us bought a new kitchen system for their new place and we paid them something to keep their old one. I understand that you had a mild winter there. In any case, the cold weather in Burlington hardly ever bothered me much, but I must admit it was nice to spend the winter in a temperate climate for a change.

At the University of Bonn I have been working with my colleague Hans-Peter Helfrich (who visited me twice in Burlington). He and I have been working on a program and paper on curve and surface approximation and I presented a paper on this work in March at the "Conference on Scattered Data Fitting" in Cancun. In addition, I have also developed a number of algorithms and programs for analyzing and fitting coordinate measurement data, including a package for analyzing circular features, a program for reduction of data measured along a parametric curve, line-fitting algorithms based on orthogonal distances in the $L_2$ metric and using "least median of squares", and an algorithm for quick alignment of surface data provided with boundary tangents and surface normals. In addition, I have devoted a considerable amount of time to familiarizing myself with and coding up a number of efficient algorithms in computational linear algebra, constrained optimization, and computational geometry.

I also finished editing the proceedings of the "Workshop on Algorithms for Constrained Approximations and Optimization" that I organized a while back in Stowe. The proceedings will appear as a special issue of "Numerical Algorithms".

The company I started, Double Star Research, has had its ups and downs, but has been providing me with a small income. However, this week I concluded an agreement with a company in Rhode Island that will guarantee me 1000 hours of work during the next 12 months, so things are looking up.

During the four months we stayed with Margret's parents I hardly got any exercise, but then I was also recovering from three broken ribs (that I got testing for my black belt in karate). Since we moved to Sankt Augustin I have been doing karate again in a small club here three times a week. I still haven't gotten rid of the weight I put on during the break, but now that winter is over perhaps I can get back down to my "normal" weight.

One of the things I did for the institute in Bonn where I occasionally still work was to build a World Wide Web home page for them. I put the framework together and there is still not much content, but if you are interested in seeing a nice home page, point your favorite browser to http://www.ipb.uni-bonn.de/msl. The page with "other points of interest" is particularly pretty.

TEACHING LICENSE

Clinton Erb

Students can remain in EMBA and take the necessary courses to become licensed to teach secondary math. For more information contact Donna Rowe, Dept. of Education, 533 Waterman Bldg., 6-3356.
MATHEMATICAL MODELING...

- from College of Engineering & Mathematics
May 1995 Newsletter

Mathematical modeling provides a powerful tool for the advancement of knowledge in the biological sciences. This is especially true at the present time, as recent advances in computational and analytical techniques have now made it possible to consider far more realistic mathematical models of complex biological systems. The potential now exists to model intrinsically nonlinear effects whose inclusion previously would have lead to intractable formulations. The College of Engineering and Mathematics currently houses two research groups that are leaders in the use of mathematical models in biomedical mechanics and engineering. Both groups have strong connections to NASA through the recently-formed Vermont Space Grant Consortium.

The human intracranial pressure modeling project is an interdisciplinary effort involving Professors William D. Lakin and Jun Yu of the applied mathematics group in the Department of Mathematics and Statistics and Drs. Paul Penar and Cordell Gross in the UVM Division of Neurosurgery.

- a complete account of this innovative project and its applications may be read in the College of Engineering and Mathematics May 1995 newsletter.

DINITZ DID IT

Jeff Dinitz

The Dinitz Conjecture

Fred Galvin of the University of Kansas proved the "Dinitz Conjecture" and articles appeared about this in Science magazine and in the AMS publication "What's Happening in the Mathematics Sciences". In January I spoke to the Mathematics Colloquium here and at Michigan Technical University on Galvin's proof of my conjecture.

-from the 10/21/94 UVM Record

The problem that bears UVM mathematics Professor Jeffrey Dinitz's name has been unraveled, 15 years after he proposed what seemed to be an unsolvable mathematical puzzle.

Two years ago, a Lehigh University graduate student solved a variation of the Dinitz Conjecture, and this year, University of Kansas Professor Fred Galvin put the final touches on the complete solution.

Dinitz works in combinatorics. His specialty is design theory. Right now, he's editing The CRC Handbook of Combinatorial Designs, a book of more than 700 pages of tables and information, including the most extensive and modern table of Latin squares in existence.

Meanwhile, the story of the Dinitz Conjecture has been featured in several magazines, including Volume 2 of What's Happening in the Mathematical Sciences and Volume 265 of Science Magazine.

What is the Dinitz Conjecture?

- from College of Engineering & Mathematics
May 1995 Newsletter

Take a 3 x 3 array (with 9 cells) and in each of the cells place a set of size 3 (there are no restrictions on these sets). The Dinitz problem in this case asks if it is always possible to choose one symbol from each cell so that you never picked the same symbol twice in any row or column.

The Dinitz Conjecture says that this is possible for any size array no matter what symbols start initially in the cells.

Specifically: Given any n x n array with a set of size n in every cell. Prove it is always possible to choose one element from each cell so that no symbol occurs twice in any row or any column.

So that is the problem. Many mathematicians worldwide worked on it, and it was featured in several magazines. The solution proved to be fairly simple, yet an entire new area of mathematics, namely list colorings, was spawned with this problem in mind.

Notes

Jeff Dinitz and Dan Archdeacon organized last summers 6th Vermont Summer Workshop on Combinatorics and Graph Theory in Burlington, VT.

In 1994 they began the Vermont-Concordia Combinatorics Seminar, Dan Archdeacon is the organizer.

In September, 1994, Jeff Dinitz was asked to serve as a member of the International Advisory Board of the Centre for Discrete Mathematics and Theoretical Computer Science at the University of Auckland and the University of Waikato, New Zealand.
Dinitz is also the webmaster for the Math Department. He is working on installing a new home page for Mathematics Department on the World Wide Web.

As you may already know, Jeff's wife Sue and son Tommy were in a major car wreck on September 9, 1994. Tommy had to spend a week in the hospital, but all are ok now.

In December-January the Dinitz's bought a new house, Bert Johansson bought their previous home.

MAPLE

Bob Wright

I continue to use Maple both in research and in instruction. I am working on methods of recovering good spline approximations to discontinuous functions given just a few low-order Fourier coefficients. To prove the robustness of these methods it is necessary to get very precise moduli of continuity for spline approximations as functions of knots. The symbolic computations would be unfeasible for me to do by hand, but they are done satisfactorily using an extension of Maple that I have developed. I have used Maple in Math 240 and Math 272 during fall '94 and spring '95, mainly as a "laboratory tool" but to some extent for demonstrations. I attended the 2nd Annual Maple Conference in Troy, NY, in August.

SOLVING THE QUINTIC

-from College of Engineering & Mathematics
May 1995 Newsletter

A poster distributed to over 3,000 mathematicians at the International Congress of Mathematicians in Zurich, Switzerland during the summer of 1994 places UVM Associate Professor David Dummit in the company of such mathematical giants as Newton, Euler, Lagrange, Gauss, Abel, Cauchy, Hamilton and Hilbert. All contributed to answering the question: given a fifth degree polynomial equation in one variable, how do you find all of its roots?

This famous problem is known as "solving the quintic", and the poster is entitled "Solving the Quintic with Mathematica". The poster features a chronology of work on the problem alongside an illustration of how the relevant ideas are used in the Mathematica system for doing mathematics by computer. The problem is of special interest in that unlike equations of lower degree, some quintic equations can't be solve by radicals. This means that the roots of certain quintic polynomials aren't expressible in terms of the coefficients if one uses only the usual operations of arithmetic combined with the operation of taking radicals, or nth roots. Although mathematicians knew in theory which quintics were solvable by radicals, no explicit formulas were published for over a hundred fifty yrs.

In a paper published in a 1992 edition of the journal Mathematics of Computation, David Dummit provided the final answer to the question posed above by producing explicit formulas for the roots of those quintic polynomials which are solvable by radicals. Coming some 450 years after the publication of such formulas for equations of lower degree by Cardano, this work caps the chronology of the problem as described on the poster.

MOVING UP & ON

Jim Burgmeier was promoted to Professor.
Jun Yu was promoted to Associate Professor.
Songjie Ren is moving on to the University of Georgia.

LECTURES

Encounters of the Gross Kind

Ken Gross

During the Fall semester, I gave an invited colloquium lecture in the Department of Mathematical Sciences at Rensselaer Polytechnic Institution.

I also served on the final panel assembled by the Louisiana Board of Regents to recommend research grants for faculty in the higher education system of the state. (The state of Louisiana has a "higher educational research fund" to which faculty can apply for EPSCoR type grants.)

Golden Opportunity

Ken Golden

The International Scientific Committee of the International Conference on the Physics of Strongly Coupled Plasmas has invited me to participate and deliver a lecture. The conference will take place September 11-15 in Binz/Rugen, Germany. I have accepted the invitation and will be lecturing on recent advances made by Limin Miao (my grad student), Professor Gabor Kalman (my long-time colleague at Boston College), and myself in establishing a phenomenological electrodynami framework for the analysis of collective mode dispersion in layered electron systems. The title of the talk is (tentatively) "Collective Modes in Correlated Superlattices".
21st ANNUAL YORK REGIONAL GRADUATE MATHEMATICS CONFERENCE

Dan Archdeacon

Dan Archdeacon gave the Keynote Address at the recent 21st Annual York Regional Graduate Mathematics Conference held at Syracuse University. This conference provides students in the region with opportunity to meet others who share their interest. Past conference speakers have included P. Lax, H.S.M. Coxeter, P. Halmos, S. Lang, M.E. Rudin, R. Fefferman, and J.H. Conway. Dan’s talk on "The Hunting of the Snark" was well received.

JUN YU CAN DO

Jun Yu

Jun Yu and one of our undergraduate research assistants, James Brosseau, will be spending two weeks of residential research this summer at NASA’s Goddard Space Flight Center in Maryland. Their task is to study the variation of the Arctic sea ice temperature using the data sent from the NASA Nimbus 7 satellite. The trip is jointly supported by the JOVE grant and a Space Grant Minigrant.

Jun Yu will be attending the sixth Annual JOVE Retreat from July 5 to July 8, 1995 in Monterey, California. In this conference, Jun will be presenting a poster paper entitled "Principal Component analysis of the Global SST Data from the Nimbus 7 SMMR".

Jun Yu and Per Gloersen, one of Jun’s colleagues from NASA’s Goddard Space Flight Center in Maryland, will be attending the XXI General Assembly of the International Association for the Physical Sciences of the Oceans, held in Honolulu, Hawaii from August 5 to August 12, 1995. They will be presenting a paper entitled "Spatial Distribution of the Quasi-biennial and Quasi-Quadrennial ENSO Components in Global SSTs".

GRANT AWARDS

Mike Wilson

Much to my surprise, the NSF approved my proposal "Bergman Space Inequalities" for two years at the level of $43,160. I will be studying and proving weighted norm inequalities that relate the boundary values and the interior derivatives of the solutions of certain partial differential equations. Getting this thing was a big, big surprise.

PAPERS PUBLISHED

Jeff Dinitz


Ken Gross


Jun Yu

Principal Component Analysis of the Arctic Sea Ice Concentrations from the Nimbus 7 SMMR, with P. Gloersen. Journal of Geophysics Research; submitted.


Oscillatory Behavior in Arctic Sea Ice Concentrations from the Nimbus 7 SMMR, with P. Gloersen, E. Mollo-Christensen. Journal of Geophysics Research; accepted.

Normal Pressure Hydrocephalus: An analysis of Etiology and Response to Shunting Based on Mathematical Modeling, with P. Penar, W.D. Lakin. Neurological Research; accepted.


THE TOLL BOOTH AND TWO GAS TANKS

Part I - The Connecticut Connection

Dave Morency

Back in November accompanied by four students: Andy Comeau, Sarah Meier, Ben Tucker and John Gunnip, I drove to Hartford, Connecticut to attend the Northeastern Section of the MAA Fall Meeting at the University of Hartford. One of the featured speakers was Joe Gallian from the University of Minnesota. He gave a very entertaining talk on breaking drivers' license codes. Everyone thoroughly enjoyed his lecture. He also conducted a two hour workshop for students on some topics in graph theory. There were student presentations from St. Michael's and Lydon State. (Maybe we could make an effort to get UVM students to give presentations in the future.)

Overall the trip went well. There was a shortage of meal tickets for MAA sponsored dinner, so we had to eat out, fortunately for us. We ate at Tucker's (no relation) Down Under and had a much better meal at a cheaper price! On the way home we stopped at a Howard Johnson Restaurant in Springfield, Vermont. While attempting to get back on I-91 my car took a wrong turn and routed us over this rickety bridge where a toll booth awaited us. Now this toll booth was no larger than one of those fishing shanties that speckle the ice on Lake Champlain in winter. We wondered who would place a toll booth out in the middle of nowhere. As we approached the booth I rolled down the window and began to explain to the attendant (strong resemblance to Ma Kettle) that I had taken a wrong turn and could she tell me how to get back on I-91. "Thirty-five cents," was the reply. I tried to explain that I hadn't intended to cross the bridge and that I was lost. "Thirty-five cents," she repeated. No matter what I said, the response was the same. "Thirty-five cents". "Jeeze, what a jerk," came a cry from the back seat. I quickly forked over the thirty-five cents. This I reasoned would get me the information I desired. I began to explain that I wanted to return to the other side of the bridge and to get on I-91. "Thirty five cents," she drolle. "I just gave you thirty-five cents," I replied in disbelief. "Another thirty-five cents to go back over," she uttered. "Cripes!" said the back seat. For one brief moment I thought about grabbing her by the neck and tossing her and the toll booth into whatever body of water we had chanced upon. I was convinced that the students needed only the slightest bit of encouragement and they would have gladly done all the dirtywork. But reason prevailed and without another word I dutifully handed over the additional toll, wheeled the car around and sped across the bridge. As we looked back in disgust toward the subject of our frustration, one of the students noticed a small sign, "WELCOME TO NEW HAMPSHIRE," it said. That explained everything! Anyway, the students enjoyed the talks and workshop and returned to UVM very enthused about their experience - and my driving ability.

Part II - Running on Empty

In April, Jim Burgmeier and I drove to Siena College with six students, Ben Tucker, Fay Smullen, Christina Collins, Krisan Stone, Jim Brosseau and Alena Mermicky to attend the Hudson River Undergraduate Mathematics Conference. We rented a Maxi van from the Geology Department (more about that later) and left at 6:30 a.m. We arrived in time for Jim Brosseau to give his talk, "Iteration, Newton's Method, the Secant Method and Fractals". It went very well. We all attended to give him support. In all, about 65 talks were given, most of them by students from several colleges and universities in the Northeast. Each talk lasted 15 minutes and was classified into one of several categories such as Graph Theory and Combinatorics, Number Theory, Fractals and Chaos, History and Pedagogy, Statistics, Recreational Math, Applied Mathematics, Abstract Algebra, etc. Jim and I were impressed with the quality of the presentations and with the overall set up of the Conference. It was very well organized and must have required a lot of work by the Steering Committee. In addition there was no registration fee and the lunch (excellent) was also free. They keynote address was given by Jean Taylor from Rutgers. Her presentation was about crystal growth models and she began by talking about soap bubbles, not coincidentally, since she had done some work with Frank Morgan (the soap bubble guy from Williams) who is on the conference steering committee and who gave a presentation at UVM on Math Day a couple of years ago. Next year the conference will be held at Skidmore and Jim and I want to go. Maybe we can recruit a few more students to give presentations. It would be good for the students and good for UVM. Thumbs up to Jim Brosseau for the fine talk and to Jim Burgmeier for his time in assistance.

On the trip to Siena I noticed that the gas gauge was moving rather rapidly toward empty. Since we were pressed for time, I didn't want to stop. However, it would have been disastrous to run out of gas. So we pulled off I-87 and found a gas station nearby. Jim got out and found the filler tube about a foot to the rear of the left wheel well. He inserted the nozzle and began pumping. The pump shut off. So he began pumping at a slower rate, but the pump shut off again. This went on for about five minutes and
we had managed to add only three gallons into the tank (actually half of that spilled onto the ground). Well we didn't have time to waste, so we hastily came to the conclusion that the gas gauge must be wrong. (I know. All you armchair quarterbacks would have correctly diagnosed the problem had you been there. Right!) That gas tank was full! We were absolutely sure. We reasoned that no self respecting engineer would design a vehicle with a range of only 150 miles on a full tank of gas. So I went inside the station and paid the attendant $4.07. He chuckled knowingly.

We got back on I-87 and proceeded to our destination fully confident that we had plenty of gas. Ignorance is bliss. Yes, we had plenty of gas, but unknown to us, not in the tank we were running on. As we found out later the van has two gas tanks and two filler tubes, and we had been attempting to put gas into the full tank. If we had run out of gas on the current tank, we would only have had to switch to the (more than) full tank using a small lever located on the dashboard. But we didn't know that! Luckily we only had 10 miles to go; because we made it on the low tank. This time Murphy's law failed. We don't like to think about what abuse we might have had to endure if we had run out of gas and called AAA. I am truly thankful that things worked out, but it would have been Jim's fault if they didn't. He picked the wrong tank to fill. One final thought... a question. Why does that vehicle have two gas tanks and two filler tubes?

**UVM MATH AWARENESS WEEK**

Joanne Brown & Karin Larson

Mathematics Awareness Week was initiated at the national level 10 years ago by the Joint Policy Board for Mathematics. The Mathematics and Statistics Department is now in its seventh year of participation and as usual has a schedule of events over a month long period (Tuesday, March 28 through Thursday, May 4, 1995). Below is listed the schedule arranged by this year’s committee: Co-chairs; Joanne Brown and Karin Larson; Karla Karstens, Jim Burgmeier; Janet Ferguson - department facilitator.

**Tuesday, March 28**

10:50 - 12:00 PM

"One Model of Calculus Reform" - Tim Pennings, Visiting Associate Professor from Hope College in Michigan spoke about "Calculus Reform" in his school’s calculus program, how they use technology for groups projects, how they continue to emphasize the basic skills through comprehensive tests, and how this has affected the mathematics department. Pizza hour and discussion followed the talk.

In early April, Math Awareness T-shirts became available for purchase for $10. This year's design is making use of a poster design from last year’s poster contest.

The Department of Mathematics and Statistics at the University of Vermont is again sponsoring a poster contest. Last year the contest drew over 1300 entries from 50 schools, and this year we hope the response will be even better. The theme for the 1995 poster contest is SYMMETRY.

The poster contest was divided into 9 grades, K-8, with a $50 savings bond awarded for the best poster in each grade. In addition, five Certificate of Merit winner were chosen in each grad. UVM students did the judging. Selected posters are on display in the main stairwell in the Waterman Building at the University of Vermont from April 24 to May 5.

On April 24-28 math questions were broadcast daily in a radio contest on WRUV. The contest was organized by the Student Chapter of MAA, and a T-shirt was awarded daily for the correct answer.

On Thursday, April 27, Margaret Kenney spoke at Kalkin Hall at 7 PM on The Key is Symmetry: How Everyone Can Create Some Attractive Math Art Using a Few Basic Steps. Dr. Kenney is currently a Professor of Mathematics at Boston College and in this capacity works with mathematics and computer science majors, particularly those students who show an interest in becoming teachers, Participants produced some interesting designs using symmetry in combination with a variety of numbers and other patterns. These designs can be used to make decorative posters and T-shirts. They can also be applied in quilt and ceramic tile making.

On Thursday, May 4, Professor Gail Ratcliff of the Department of Mathematics and Computer Science, University of Missouri at St. Louis, will speak at a luncheon honoring high school math contest winners, their parents and teachers. This talk is in conjunction with the High School Prize Examination Committee, chaired by Larry Kost, and is titled: Discovering Symmetry in Wallpaper, Tiles and the Work of M.C. Escher. A talk will also be presented to a wide audience, including university and community members at 4:00 PM, 104 Aiken Building. This talk is titled: Wallpaper, Tilings and M.C. Escher: An Exploration of Symmetry.
MATH CONVERGENCE ON BOSTON: 22,000 "POINTS OF LIGHT"

Apr. 6-9 NCTM 73rd Annual Meeting in Its 75th Year

Karin Larson & Joanne Brown

UVM Math/Stat Dept. torch bearers: chariot driver, Karin, Joanne, Holly, and Karla; Flame Re-fuelling Headquarters: Rm 1502 Sheraton (Yes, 4 women can manage in one room!)

Some resulting questions and comments: We couldn’t think of a better way to get a quick update of what is happening math curriculum-wise in schools across the country from Hawaii to Maine that affects what we see in our classrooms in Sept. Where else does one see exhibits on three floors of a convention center and hotel from most publishers involved with math, math technology companies, and teacher-developed exhibits on materials and alternate methods to "teacher-talk"? Where else does one get the strong message that graphing calculators are going to gradually be standard equipment that students will have when they come to campus? The latest TI 92 can do symbolic forms of derivatives and antiderivatives. Veteran calculus text writer, Louis Leithold, showed numerous illustrations of problems where the graphing calculator facilitates getting students to write and explain properties of functions as related to their graphs. Serendipity - I preside at a session on "graphic organizers" presented by Lois Mosely from an Education Service Center in TEXAS that uses "visual organizers to focus on thinking" developed by John Clarke of U. of VERMONT. I didn’t know John was into trees, matrices, and Venn Diagrams. And gratifying for me is that his writings and Lois’ implementation of his ideas dovetail with a main theme I have stressed in concept development and problem solving strategies.

There were a great many interesting sessions as well on calculus reform, writing in the calculus class, and problem solving approaches to post secondary mathematics.

MATHFEST IS COMING AUGUST 6 - 8

Jonathan Sands

The Annual Summer Meeting of the American Mathematical Society, the Mathematical Association of America, and Association for Women in Mathematics are all taking place at UVM this summer during the exciting Mathfest which several members of our department are helping to organize. It is an honor to be hosting this event which may draw as many as one thousand mathematicians, along with some of their family members. This is also an opportunity for UVM and our department to get some great publicity. The Summer meeting is always designed to include recreational opportunities as well as mathematical interaction, and UVM is well prepared to offer both.

Roger Cooke, Mike Wilson, David Dummit, Jonathan Sands, and Dan Archdeacon are all organizing Special Sessions in which papers will be presented in the areas of research which they have chosen. Our former faculty member Hongming Ding is also organizing one of these sessions, so we will have a chance to see him again.

Holly Puterbaugh and Joe Izzo will be serving on the Local Arrangements Committee chaired by Jonathan Sands. Along with Denise Mulry of Trinity College, Anthony Julianelle of St. Michael’s College, and Janine Clokey of Middlebury College, they will be responsible for staffing a table with local information, and will be helped by UVM students such as Rob Poodiack, Brian Wilson, Sarah Thiery, Tim Singleton, Steven Brill, Shawn Warren, Andy Comeau, and Sarah Meier.

Planners are hoping that recreational activities will include a ride aboard the new excursion boat at the Burlington waterfront, soccer, trips to Shelburne Museum and Stowe, hiking in the Green Mountains, and fishing on Lake Champlain.

There are many opportunities to get involved. If you are interested, you could begin by contacting Jonathan Sands.

PROGRESSIVE OPEN HOUSE

Jan Johansson, Jeff Dinitz, and Dan Archdeacon all bought new houses this winter.

Jonathan and Peggy Sands (officially still newlyweds until June of 1995) have settled nicely into their home purchased last year. For those of us who missed the 1st Sands open house, we were given another chance.

A Progressive Open House on April 29, provided the Department with an opportunity to get to know our co-workers and their families a little better. The event started at 1 p.m. at the Sands lovely home in Burlington and "progressed" to the Archdeacon resort on Lake Iroquois. From there the gang trotted to the Dinitz manor just a hop, skip and a bump down the road. All our hosts and their families were quite generous in providing refreshments. We enjoyed the tour and the conversation. Thank you.
HONORS DAY AWARDS

Friday, April 21, 1995

The college of Engineering and Mathematics held its annual Honors Day ceremonies in Ira Allen Chapel at 3:30 p.m. on Friday, April 21. Many students were honored for their academic achievements. Refreshments were served after the ceremony in the Apse of the Billings Student Center.

The guest speaker for the Honors Day ceremony was Kirsten Gowdy a 1993 graduate of the Civil Engineering Department at UVM and is currently a design engineer for Delucia-Hoffman Associates, Inc.

Mathematics

Sophomore Award  Danielle E. Brown
Senior Award  Sarah P. Meier
  Brad A. Mongeon

John F. Kenney (Graduate) Award  Graciela S. Herrera

Nam San Kil Award  Andrei V. Zherebtsov

Statistics

Graduate Award in Statistics  Shelly J. Naud
  Xianjiao Jian

Graduate Award in Biostatistics  Jeffrey B. Preble

Nam Sang Kil Award  Xianjiao Jiang
  Shelly J. Naud
  Sean P. Mahabir

Mu Sigma Rho  Mahmoud H.M. Al-Ostath
  Ricardo M. Anzaldua
  Franz A. Bayog
  Xianjiao Jiang
  Ramesh Krishnan
  Shelly J. Naud
  Jeffrey B. Preble
  Martha E. Wadsworth

Electrical Engineering

Sophomore Award  John T. Bizzarro, III
  (Dept. work-study)

DEPARTMENTAL AWARDS

Tuesday, April 25, 1995

Besides the Sophomore, Junior, and Senior Awards in EMBA, the Nam Award, the Kenney Award for graduate students, and the Senior Award in A&S, we chose outstanding first-year students in both EM and A&S, and outstanding sophomore and juniors in A&S for special recognition. Statistics has also decided to recognize their outstanding students. We recognized these new categories of students on Tuesday, April 25, at 5 p.m. in the Conference Room, just before a meeting of the Math Club. The other awards of course were given on Honors Day.

First-year Award

Alena Mermicky (EMBA)
Xuan Zhang (EMBA)
Jonathan Gunnip (A&S)

Sophomore Award

Krisan Stone (A&S)
Fay Smullen (A&S)

Junior Award

Barbara Mikes (A&S)

Outstanding Graduate Teaching Fellow

Sarah Thiery

CHALLENGE!

Karin Larson

Life has many puzzles...
Many shades of gray...
Challenges of distinguishing reality from perceptions
Looking for ways to see new dimensions and perspectives.

Escher and Karin invite you to play with some of the pieces and thoughts of M.C. Escher’s puzzle on display in the Conference Rm. at 16 Colchester Ave.

Karin will frame it if it ever gets completed (even if pieces are missing).
NATIONAL MATH CONTEST

Jan Johansson

The Forty-sixth Annual American High School Mathematics Examination (AHSME) was held on Thursday, February 16, 1995. This annual examination, which was taken by 255,967 students from 5,491 high schools in the U.S., Canada and abroad, is a 1.5 hour, 30 question, multiple-choice examination, based on non-calculus secondary school mathematics, with problems ranging from easy to extremely difficult. The purpose of the AHSME is to identify and encourage, through friendly competition, students with an interest in and talent for mathematical problem solving. Students who do particularly well are invited to participate in further competitions and may be invited to become members of the U.S. team in the International Mathematics Olympiad.

The highest scoring student in each school receives a pin or medal recognizing his or her achievement.

Jan Johansson of the UVM Department of Mathematics and Statistics is the Vermont examination coordinator. He released the following list of winners from the 15 participating Vermont High Schools:

James Reichert Mt. Anthony Union H.S.
Todd Suydam Black River H.S.
Kristina Koutrakos Leland & Gray U.H.S.
Daniel Curvelo North Country U.H.S.
Sean Benson Colchester H.S.
Benjamin Morse Essex Junction Ed. Ctr.
Erik Fergusson Hartford H.S.
Jairam Ramanathan South Burlington H.S.
Joshua Otis Woodstock U.H.S.
Charles Hooper Burlington H.S.
Theodore Chilek Springfield H.S.
Alex Novosytlkov U-32 H.S.
Allison Cohen The Mountain School Program/Milton Academy
Taylor Perron Mt. Mansfield U.H.S.
Garrett Alston Williamstown Jr-Sr H.S.

HIGH SCHOOL MATH CONTEST WINNERS

Jack Lawlor

On Tuesday, March 14, the Thirty-eighth Annual High School Prize Examination in Mathematics was administered at 59 secondary schools throughout Vermont. This year, more than 2300 students participated in the contest and First Prize was awarded to Jairam Ramanathan of South Burlington High School; a complete list of other state-wide and regional winners appears elsewhere in this newsletter. These students will be guests of honor at UVM on Thursday, May 4 when they will receive their prizes as part of the Math Day program. Certificates are awarded to the student who submits the best paper from each participating school and to all students who place in the top ten percent.

The examination is prepared and graded by members of the Contest Committee which is chaired by Larry Kost. The other members of the committee are Dave Morency, Jan Johansson, Helen Read, Karla Karstens, Bob Wright, Holly Puterbaugh and Jack Lawlor. Copies of the examination (and answers) are available from Larry.

State Winners

1st Prize - Jairam Ramanathan (So. Burlington H.S.)
2nd Prize - Constantin Popovtsev (Colchester H.S.)
3rd Prize - Daniel Luke Herrlin (Mill River U.H.S.)
4th Prize - Iain Nathaniel Gorton (BFA, St. Albans)
5th Prize - Charles Hooper (Burlington High School)

FELLOWSHIPS

Ken Gross

Tom Peirahno, graduate of Burlington High School, past three-time winner of the Department’s Mathematics High School Prize Exam, and now in his junior year at University of Chicago, was named a National Goldwater Fellow in Mathematics and Science. (Two such fellows are named each year from each state. Tom was a recipient from Illinois.)

The Third Annual Summer Mathematics, Science, and Technology Summer Enrichment Institute for talented high school students will be held on campus the week of June 25-30. The Institute is organized by the Vermont State Mathematics Coalition, and co-directed by Tony Trono (former Department Chair of Mathematics at Burlington High School), Ken Gross, and Ted Marsden (Chair of Mathematics at Norwich University). Thirty outstanding mathematics and science students from across the state will attend. Major sponsors this year include EPSCor, the Office of the Provost and the College of Engineering and Mathematics at UVM, Mt. Mansfield TV (WCAX), and Simmonds Precision (B.F. Goodrich), and the Vermont Space Grant consortium. A list of events may be seen in Janet’s office.
MATHCOUNTS

Jack Lawlor

On Saturday, February 25, 1995, Jan Johansson, Larry Kost and Jack Lawlor served as judges in a regional MATHCOUNTS competition. MATHCOUNTS is a national mathematics competition for students in junior high school and is sponsored in this state by the Vermont Society of Professional Engineers and nationally by the National Society of Professional Engineers, the CNA Insurance Companies, the General Motors Foundation, the Intel Foundation, Texas Instruments Incorporated, the National Council of Teachers of Mathematics and the National Aeronautics and Space Administration. Jan, Larry and Jack administered the Countdown round during which the top ten finishers from the earlier rounds compete one on one in Jeopardy-style matches until a winner is determined. The MATHCOUNTS competition was held in the Votey Building and was followed by a luncheon in Cook Commons. Incidentally, the team from the Mater Christi School (our neighbors across the street) finished second in this event and went on to win the state title a few weeks later. They will represent Vermont in the National to be held in Washington, D.C. later this spring. Good luck to them!!

CAREERS AND HONORS

Roger Cooke

Following last year’s successful careers night for math majors, the Math Club, advised by David Morency and ably led by President Andy Comeau and Vice-President Sarah Meier, arranged a still more elaborate program this year, with presentations by four UVM mathematics/statistics alums and David Lounsbury of the Career Development Office. Alumni H. Greg Johnston (’76) of the Aquatec Firm, Susan Steinberger (’90) of Bombardier Capital, Mark Benton (’86) of Summit Financial Center, and Bill Stearns (’91) of Cybermall spoke to an interested audience of undergraduates of their experiences, how to find a job and how to gain advancement once you find it. Important points were: 1) Be sure you have some concrete skills such as facility with computing to land your job; 2) Make maximal use of the problem-solving skills you have learned through mathematics to show your employer how valuable you can be. David Lounsbury reinforced these points and told the students about assistance available from the Career Development Center in such matters as locating potential employers and preparing resumes.

New!! AWM Comes to UVM!

The two A&S sophomores chosen as the outstanding mathematics majors, Kristan Stone and Fay Smullen, have organized a chapter of the Association for Women in Mathematics. The national organization started in the 1970’s has now become a thriving institution, dedicated to helping women succeed in the male-dominated world of the mathematical sciences. Kristan and Fay got the idea while working on a project required for Mathematics 161 (Development of Mathematics). Since they were reporting on the topic of “women mathematicians,” their research led them to discover the existence of AWM, and they decided to make their project more “activist”. They signed up 13 members, found an advisor (graduate student Nancy Haas), wrote by-laws, and obtained recognition by the Student Government Assn. They will serve as co-presidents next year, Alena Mernicky (outstanding first-year math major in EM) will be secretary, and Christina Collins will be treasurer.

Fay Smullen Wins Kidder Scholarship

Honors and achievements are raining down on Fay Smullen this spring. Besides serving as secretary of the Math Club this year and organizing the first UVM chapter of the Association for Women in Mathematics (along with Kristan Stone, with whom she shared the award as outstanding sophomore), Fay has now been awarded the George Kidder Scholarship of the College of Arts and Sciences.

NULL SET TRIUMPHS

Helen Read

The Null Set, a.k.a. Helen Read and Roger Cooke, recently represented the Math Department at College Jeopardy. After an evening of exciting, fast-paced play, the members of The Null Set were the champs.

The Null Set, mainly on the strength of Roger’s lightning speed and vast store of knowledge, won its match and advanced to Final Jeopardy. With all their money on the line, it was Helen’s superior knowledge of current events—the recent announcement that tan M & M’s will be discontinued and replaced by blue ones—that paved the way to victory.

College Jeopardy, sponsored by the Inter-Residence Association, was an alcohol free event in which pairs of students, faculty, and staff competed for fun and prizes. Fourteen teams from various residence halls and departments participated.

The Null Set plans to donate its $100 winnings to the Math Club.
MATH CLUB

Dave Morency

The Math Club has had a very successful year thanks to the hard work and enthusiasm of the officers and the interest of the current members. Not only has membership increased over last year, but there has been a significant improvement in the activity level. Here is a list of some of this year’s accomplishments: organized an orientation and information session for potential new members; attended the Northeast Section of the MAA conference at the University of Hartford; formed a peer advisor group to assist math majors with their academic programs; organized a graduate school information session; established an email network for communicating among members; participated in the Hudson Riber Undergraduate Mathematics Conference at Siena College and organized a career information session (Tuesday, April 25th). So, congratulations to Andy Comeau, President, Sarah Meier, Vice President, Fay Smullen, Secretary and Ben Tucker, Treasurer, for doing such a fine job!

More Math Club

Ben Tucker

'94-'95 was a very successful year for the Math Club. We had a great turnout, which included some St. Mike's math students, for our informal panel discussion about graduate school. We sent a number of students to the MAA conference in October at Hartford. Jim Brosseau presented a paper at the Hudson River Undergraduate Mathematics Conference at Siena College this April. It sounded like everyone had a great time. We had a number of general meetings and a career panel similar to our grad school one. We've got a great group continuing with the Math Club next year so it looks like '95-'96 will be even better!

NEWS FROM THE DUNGEON

Dan Archeacon

The graduate program continues to grow with a record 26 students. This year the Department welcomed Neil Aguilar, Sharon Fox, Shaodong Jiang, Timothy Llor, Chris Lyczynski, Sean McAuliffe, Robert Poodiack, Shelton Shepherd, Timothy Singleton, Ashley St. Martin, John Sullivan, Shawn Warren, Brian Wilson, Jie Wu, and Junjun Ying.

Congratulations to Graciela Herrera and Qifu Zheng for passing their Oral Comprehensive Exams for the Ph.D. Also, kudos to Sarah Thiery and Paul Tremblay for their fine performance in their Master's Oral Examination.

Shelton Shepherd gave a talk at Graduate Research Day on "Education and the African American Male". Nice talk, Mo (nice suit too).

We will have four new GTF's in the fall of 1995. We're happy to welcome Susan McAuliffe, Ian Stobert, Scott Stevens, and Sherri DiBernardo. Some of you may remember Susan (nee Steinberg) from her undergraduate studies here. Scott Stevens also couldn't keep away; he's returning to work on his doctorate. Ian comes from Carleton University in Ottawa, and Sherri from St. Mike's.

One final dungeon activity: Ping Pong. Jeff Diritz (alias The Boss) came up short against the favorite, Pretty Boy (a.k.a. Brad Mongeon an undergraduate student). Congratulations Brad on your win!

This year marks the inaugural Vermont/Quebec Joint Seminar in Combinatorics and Computer Science. Members from mathematics and computer science have been meeting regularly with faculty and students from Concordia University and from the University of Quebec at Montreal. Talks alternated between Burlington and Montreal, with each site contributing one speaker.

NEW KIDS ON THE BLOCK

Professor Gino Moretti

Professor Gino Moretti, one of the pioneers of Computational Aerodynamics, has retired to Burlington and accepted an adjunct position as Visiting Professor. Professor Moretti has taught a Topics in Complex Variables course this spring and anticipates giving this course to our graduate students on a regular basis.

Tim Pennings

Several people have asked me, "Why did you choose UVM for your sabbatical site?" Well, variety is the spice of life. Coming from western Michigan with flat terrain, a flat lake, and rampant conservatism (Bush campaigned at Hope College in '92), I figured that UVM would provide a welcome change of pace. So I called Jeff Dinitz who gave me a job, and called Janet who found me a house-downtown amidst the students, Ken Gross and other wild rowdies.

I've enjoyed UVM. My class provided a great source of competition and fun in everything from ping pong, racquetball, and arm wrestling to snowbell fights, frisbee and watching hairs fight. Jianke Yang
and I found common research interests and took a couple Sunday trips exploring the area. The grad students were faithful and enthusiastic at ping pong and cookies. Not to be outdone, Karla, Roger, Jeff and Bert provided fine dining company on Monday nights over KFC and Leonarados, and Dan solved many a math puzzle over lunch.

Like a ball bearing between two magnets, I now leave UVM regretfully but refreshed, and head back to Hope College where I anticipate a good summer doing research with two undergraduates in dynamical systems.

Brett Tangedal

I went to UC San Diego as an undergraduate and received a bachelor’s degree in physics in 1985. I then spent two years in Colorado and received a masters degree in physics in 1987. After working in industry for a brief period I went back to graduate school and obtained a Ph.D. in mathematics from UC San Diego in 1994 under the direction of Harold Stark. My main interest is in algebraic number theory.

I was born and raised in San Diego and enjoy skiing, soccer, surfing, and tennis. I am fluent in Swedish and Norwegian.

Jianke Yang

I received my BS degree in Applied Mathematics from Tsinghua University (Beijing, China) in 1989. Upon graduation, I was hired to teach in the same university. In 1990, I went to graduate school at the Massachusetts Institute of Technology. My thesis studied some nonlinear wave equations arising in the theory of water waves. I received my Ph.D. degree in Applied Mathematics in 1994, and then was hired by the University of Vermont as an Assistant Professor. My current research is on nonlinear waves with applications to water waves, optical fibers, etc.

Karen Wright

My illustrious career at the University of Vermont began in 1980 as a Records Specialist I in Accounts Payable. One quick year later I broke into the Financial Aid Office as a Records Specialist II. In 1987 I was reprimed and decided to surf the Temp wave and experience the good-life on the outside for an all too brief year and a half. Then back to UVM and the Department of Medicine. My first stint was with the Metabolic Unit for about 3 years as the Grants Manager. After a while you get used to the idea of being a “lifer” but it sure came as a surprise to me when my position was dissolved and I was paroled to the streets once more. Six months later I was back in the joint doing hard-time as a Medical Technical Secretary and assigned a cell in the Gastroenterology Unit, (just down the hall from my last bunk, only this time I had a window).

Well, as you can see 3 years later I’m still in the Big House but apparently someone up there must like me and decided to give me a lighter sentence. I’m grateful to the powers that be that brought me to the Mathematics and Statistics Department. The feeling here is more like community service and I’m proud to pitch in and do my time. I’ve been able to get weekend passes and am involved in local poetry readings and am also dedicated to my spiritual beliefs. I even get visiting privileges with my family.

Our family bought a home in 1991 (at the height of interest rates, and a low spot in my career). Ugh! I need a raise. Maybe if I make license plates in my spare time. I have been married for over 21 years and have 2 sons. My eldest boy, Matthew just turned 20 and enlisted in the U.S. Army 2 years ago and is currently stationed in Fairbanks, Alaska - he hates it and says if he wanted to freeze his off he would have stayed in Vermont. (Is he kidding? It’s been warmer in Fairbanks than it has in Vermont this year!) My youngest son, Lucas is 5 yrs. old and in kindergarten in Essex - he hates it and says if he wanted to learn something he would rather do it in pre-school with his old pals at the UVM daycare. (Yes he was born while I was incarcerated.) My husband, to his dismay is also a “lifer” only he’s doing his time at IBM. He hopes to get time off for good behavior soon and has dreams of starting his own business building bamboo fly-rods, (or is it splinters?)

We have 2 cats, Molly which we thought was female because well, with all the long hair we just plain couldn’t tell until we took them to the vet, and Boy (that’s his name) - has no personality and we were sure he was male so we just call him the boy cat.

We also have a black rabbit named Eb-bunny (Ebony). I plan on getting a parakeet soon as I’ve always enjoyed teaching them to talk and do tricks.

We have lots of friends and family...ok, ok, I’ll stop! Janet asked for it though. I thought she should write something welcoming me but she didn’t know what to say. Sorry, the rest of you had to pay the price. Seriously, I’m very proud to be a part of such a warm and friendly department. I thank you all for such a wonderful welcome.
WHAT’S HAPPENING IN STATISTICS

Statistic Electricity

-from the College of Engineering & Mathematics May 1995 Newsletter

A faculty member and graduate in the Statistics Program are playing an important part in EVermont, the Vermont Electric Vehicles Demonstration Project, by creating and maintaining the data base by which these cars will be evaluated.

In the northeast, some 20 public pilot projects are testing electric cars as part of a nationwide effort to look at alternatives to gas-powered engines. Vermont, which has some of the most rugged driving conditions in the U.S., is the only one among them to study the effects of battery-sapping cold climate on the cars.

Vermont’s project is funded by a $250,000 federal ARPA grant and $375,000 in contributions by Vermont partners in the state government, utility and other companies, and the University of Vermont.

Larry Haugh, UVM professor of statistics and member of the EVermont Steering Committee, worked last year with David Vachitis, a UVM statistics graduate student on planning and evaluation aspects of the project. EVermont is evaluating seven pickup trucks and a GeoMetro, many of which were purchased by Vermont utilities for this project.

In September at the National Meeting of the National Meeting of ARPA and Regional Consortia for the Electric and Hybrid Vehicle Technology Program, three in-state cars and five others from around the country competed in a road "race" in the Smuggler’s Notch area. Vachitis, who created the data base and monitored data gathering, set up the tests. They included a hill climb up Rte. 108, an endurance test of 20 miles of Vermont back roads, and a quarter-mile sprint.

For routine use, seven of the eight Vermont vehicles are equipped with data loggers. Every 10 minutes these instruments record speed, temperatures, power used by the drive train on-board heater and other information. The data logger is hooked to a cellular phone by modem. From UVM, Vachitis was able to call any car and download information from the data logger to his computer.

Data will pinpoint the vehicles’ efficiency in many ways: for instance, how their range varies with the temperature, and how well the lead-acid batteries work in cold weather. Data will also be transmitted to a national data base which has begun compiling data from a wide variety of other demonstration projects.

EVermont has been awarded funding for a second phase of the project beginning in 1995, which will study thermal management such as insulation and heating the cabs.

Both projects have the potential to develop electric vehicle expertise in Vermont, with consequent economic development for state companies. They also provide practical experience for graduate students like David Vachitis and Ed Nelbach, who will be the project’s research assistant in 1995.

New ISI Member

Professor Larry Haugh, director of the statistics program has been honored by his recent election to membership in the International Statistical Institute. The ISI has its headquarters in the Netherlands and currently has 1,800 members in over 90 countries of the world. It elects members annually "by virtue of their distinguished contributions to the development of application of statistical methods, or to the administration of statistical services."

The Buzz On Buzas

Jeff Buzas

I am giving a talk at the annual meetings of the American Statistical Association in Orlando this August and will present new results on instrumental variable estimators in non-linear measurement error models.

Stat Student Association and Stuff

Jeff Preble

The Statistical Student Association (SSA) has participated in several extracurricular activities during the 1994-95 school year. Many members (Ric Anzaldua, Joe Carpenter, Bill Dougherty, Dan Gottlieb, Larry Haugh, Ann Heath, Julie Heyd, Jeff Preble, Mukta Tripathi, and Dave Vachitis) formed an intramural volleyball team during the fall semester, which was appropriately named The Standard Deviants by last year’s president, John Durski. While the team will not be remembered as one of the more successful teams in history, fun was had by all.
Members have also participated in other activities. Dan and Jeff helped in greeting visitors to the Audubon Society's "sugar on snow party" in March in Huntington, while Joe, Julie, and Jeff are currently working on raising funds for the Chittenden County Committee on Temporary Shelter (COTS) walk-a-thon on Sunday, May 7. COTS works to find housing for about 1000 homeless Vermonters a year.

Shelly Naud, Ed Nelbach, and Mukta Tripathi have also been active in giving suggestions and organizing social activities.

ANNUAL DEPARTMENT PICNIC

Janet Ferguson

The Annual Department Picnic will be held September 10, from 2 - 7 p.m. at the Maple Street Park/Pavilion in Essex. Volleyball, shuffleboard, horseshoes, basketball, and more will be available. Bring your softballs, bats, mitts, etc.

Grad Students vs. Faculty Softball

Sara Thiery

Saturday, May 6 is the grad students vs. faculty softball game and picnic. Game time is 11 a.m. at the Patchen Road Field. The picnic begins at 1 p.m. following the game at the Community Center at Fort Ethan Allen. Spouses, children and friends are welcome to join the fun and food.

Please remember to sign up in the mailroom as to your food item that you will bring to share so we know what else we are going to need.

JOKE

Janet Ferguson

An engineer, a mathematician and a physicist were standing around the university flagpole when an old English professor wandered by.

"What are you doing?" he asked.

"We need to know the height of the flagpole," answered one, "and we're discussing the formulas we might use to calculate it."

"Watch!" said the old English professor. He pulled the pole from its fitting, laid it on the grass, borrowed a tape measure and declared, "Exactly 24 feet!" Then he replaced the pole and walked away.

"That's an English professor for you!" sneered the mathematician.

"We ask him for the height, and he gives us the length!"

HAPPILY EVER AFTER

Engagement

Congratulations to Stephen Brill and his fiance Frances Wolfe on the announcement of their engagement. The wedding date is set for June 17. Steve and Fran have just purchased a lovely country home in Jericho.

The Math Department should mark their calendars for August 12 - and watch for further information about a party at Steve's house.

Marriage

Nobles-Costa

Tsana Costa (mathematics lecturer) and Michael Nobles were wed on November 12, 1994. Tsana and Michael have made their home in Hinesburg, VT.

Births

Jun Yu: a son, Cody was born in January.

Shawn Warren: a daughter, Olivia was born in December.

Janet Ferguson: 2 grandsons, Nicholas was born in March, and Thomas was born in September.

THE MATHEMATICS OF LANGUAGE

- from The American Heritage Dictionary

If all words were statistically equal, then each word form would occur about 16 times in the million-word text, and each lemma about 26 times. In actuality the rate of repetition of individual words, and thus their frequency, is extremely uneven. However, word utilization in actual use varies enormously. The overall statistics are quite striking: the use rate of the first 100 most frequent words is so high that the first 100 word forms account for a full 47.4 per cent of all the text, that is, of all the running words (tokens) contained in the million; the 100 most frequent lemmas make up 49.6 per cent of all the text. To account for 80 per cent of the entire million-word text takes only 2,854 different word forms belonging to 2,124 distinct lemmas.

This highly skewed frequency distribution, exhibited by the words of any language, may lead to a false conclusion. The fact that one needs to know fewer than 3,000 words to understand 80 per cent of a reasonably representative modern English text does
not mean that this kind of vocabulary could guarantee any of us cultural survival in a modern society. It must be realized, first of all, that many of the most frequent words in English are function words: articles, prepositions, and auxiliary verbal forms such as those of be, have, or do. The definite article the is by far the most frequent word in English, occurring 69,975 times in the million-word corpus. Although in the overall text the dominant parts of speech are nouns and verbs, accounting for about 26 per cent and 18 per cent, respectively, of all the word tokens, function words have by far the highest frequency of any category. But it is precisely the function words—as essential as they may be for signaling the exact role of content words and their syntactic relation in a sentence—which are also the ones that because of their high predictability can be most easily guessed if they happen to be omitted from the text. Such omissions are precisely what characterizes newspaper headlines: Actor Found in Critical Condition After Explosion has been deprived of all articles and auxiliaries; in a full text the sentence would read something like An actor has been found in critical condition after an explosion. An eleven-word sentence has been reduced to a seven-word headline. From the point of view of transmitted information the function words are thus less crucial than the content words for the general understanding of a sentence. The less predictable a word is in a given context, the more its presence contributes to the "surprise value" of the sentence, to its information role. In this sense the less frequent the word, the more important it will be—statistically speaking, at least—for understanding the communication. The 20 per cent of the text that is accounted for by the words of low frequency, none of which occurs more than 40 times in the million tokens, turns out to be crucial to the process of comprehension.

Words occurring only once in the entire million words of text constitute about 36 per cent of all distinct forms and a whopping 58 per cent of all lemmas. While the contribution of those words is very substantial, they account for a minute proportion of the text itself—some 2.2 per cent, or about 22,000 occurrences per million. Nevertheless their communicational role is clearly important. High-frequency words, not only function words but common content words as well, are certain to occur in any text of reasonable length. The appearance of a particular low-frequency word, on the other hand, is quite unpredictable even in a long textual sample, because the choice of these words is necessarily tied to the subject matter and purpose of a given communication. While we can thus rely on the statistical fact that a large percentage of vocabulary items found in any reasonably representative English text, even one of sizable length, will appear only once, we cannot predict which particular words they will be for any particular textual body.

If an understanding of 80 per cent of any text were sufficient for us to function as literate persons, we could manage with a vocabulary of less than 3,000.

Karen Wright

I hope this explains the length of this Newsletter.

OUR CONDOLENCES TO:

Jeff Dinitz and Gerard LaVarmway whose mothers passed away in recent months, and to David Whitmore whose wife passed away very recently.

All members of the Mathematics and Statistics Department extend our most heartfelt sympathies to you and your families.