

## **Chairs Column** **By Jon Maatta**

Greetings! It has been one whole year since I assumed the responsibilities of the Chair of the Department. Many changes have occurred within the Department and the College during this time, some good and some bad. One of the exciting changes campus-wide has been the establishment of the Honors Program with PSC. The courses taught in the honors program are general education courses limited to honors students. This has been very successful. Instructors are enthusiastic about the program because they are able to teach special topics at a higher level than to a general population. In the fall, Keith Ferland taught an honors section of the ever popular course MA150: Math and Humanities. This coming fall Judy Buck will be teaching an honors section of MA201: Problem Solving in Algebra Using Technology.

As mentioned last year, the mathematics requirement for admittance to PSC has changed for the better (more mathematics in high school). As a result, major changes have occurred within the Department. Gone are the days of multiple sections of (remedial) MA107-108 and MA110: Intermediate Algebra. In their place are multiple sections of MA150: Math and Humanities and MA201: Problem Solving in Algebra Using Technology. I believe these changes have improved the general morale of both the students, who are learning college-level mathematics, and the faculty, who no longer have to deal with remedial algebra.

### **Department Review**

Much of our time during the year was focused on issues raised by the review of the Department performed by Dr. Donald Kreider, Professor Emeritus, Dartmouth, at the end of the spring semester 1999. His discussions with us during his visit and his subsequent review document gave us many issues to address this year. His review was generally favorable and focused on our strengths and suggestions for improvements in other areas.

One of the suggestions was that we consistently and appropriately incorporate technology into our curriculum; see Bob Hayden's column on Technology. Hopefully, in the 2001 AfterMath, I'll have more to report concerning this issue. On a related note, Judy Buck, Bill Roberts and Tom O'Donnell were awarded grants for curriculum development through the newly formed Technology Across The Curriculum Board (TAC). Judy and Bill will be working on issues relating to calculus and Tom will be working on ideas for MA201: Problem Solving. They are expected to show the results of their work during the fall faculty forum. We, look forward to seeing the fruits of their efforts.

Another suggestion in Kreider's report was the establishment of clearly defined and consistent offerings of the courses we have listed in PSC's catalog. In previous semesters, courses could be cancelled due to low enrollments. With the cooperation of the administration and the work of Larry Blaine, Dick Evans, and Ted Giebutowski, the Department has a proposal that would guarantee when particular courses would (regardless

of enrollment numbers). This is extremely important for both our majors and the faculty.

Another challenge facing the Department and PSC as well as many other colleges is the recruitment and retention of students. The Department has renewed its efforts in this regard.

- The Talent Grant in Mathematics program continues to progress. The Grant is a renewable \$2000.00 award for first-year New Hampshire residents (potentially \$8000 over the course of four years).
- The continued upgrade of our Department web page. Logon and connect to [www.plymouth.edu](http://www.plymouth.edu) and follow the links to the Department page and see for yourselves all the activity that is occurring within Mathematics and at PSC. Also e-mail the Department with your ideas or suggestions or just to say "hi".
- The Department continues its strong outreach efforts by offering a number of workshops or institutes during the summer, and evening courses during the year. All of these can earn educators graduate credits or credit towards certification. Again look at the Department's web page for more information.

Mathematics educators in New Hampshire; If you have potential mathematics majors, please keep us in mind and tell your students the wonderful opportunities available at PSC.

### **Technology News**

The Department continues to write Computer Advisor Board (CAB) proposals for upgrades in computer equipment and software. This coming year we were granted four projects, two dealing with software improvements and two dealing with hardware upgrades. This past year saw immense growth in the use of our computing lab and our multimedia classroom. More and more faculty are incorporating technology into their classrooms, from graphing calculators to CD-ROM's and computer software to the internet. WOW! How things have changed in the past five years.

### **MAP: Mathematics Association of Plymouth**

MAP, the student group, continues to be a viable group that sponsors activities throughout the year.

- Six people participated in a hike of Welch/Dickey in early fall. Fun was had by all.
- An end of the fall semester game night in the HUB continue to be a great success with a number of faculty and students participating. Everyone was challenged by the Department's Minnesota Fats: Keith Ferland.
- During the spring semester, MAP sponsored a bowling night and a trip to the Science Museum of Boston.
- The Third Annual MAP / Mathematics Department Banquet was held at the Italian Farmhouse and again it was a huge success. The event continues to grow and it gives everyone- students, faculty, and parents- the opportunity to celebrate the successes of the year in a relaxed atmosphere. Keith Ferland gave the keynote address on one of his

favorite topics: topology. Keith Ferland and Bill Roberts were voted Co-Faculty Members of the year and many students were recognized for their work throughout the year.

- The softball game was re-instituted this year and was a resounding success. Surprisingly (based on this springs weather), we picked a day that was reasonably warm and dry. Two full teams were formed and a five-inning game was played. It goes without saying that the faculty team, with the help of Connor Barry (Jack Barry's son), Robin Lubguban (student) and Nick St. Germain, (student) prevailed with a hard fought 12-10 victory. The best news was that the game was so well attended and that only two minor injuries were reported by the faculty. Everyone adjourned to Keith Ferland's house for a picnic afterwards.

As you can see, MAP is going strong and last year's president Rachel Lorenz will be returning for the coming year. I'm sure it will be an equally successful and exciting year.

Since the last AfterMath, the Department has lost two good friends. As mentioned in last years' issue, Lorraine Paquette was diagnosed with cancer shortly before her scheduled retirement in July. Though she was optimistic about her prescribed treatment, Lorraine passed away on September 30, 1999. Those of you who remember Lorraine, know that she was a dedicated and conscientious member of our community and she kept the Department running smoothly for many years. She always had time for a chat or laugh. We miss her smiling face and friendly manner.

Then in February 2000, Bill Robert's wife Barbara passed away suddenly. Barbara was a PSC graduate (1970). This was a shock for all in the Department and College. Fortunately for their kids, Billy and Beth, and Bill, the PSC community and the New Hampton community rallied to their sides. Currently Billy is planning to attend Illinois Institute of Technology in Chicago next fall. Beth has one more year of high school to go. She will be spending much of this summer in Europe practicing her French. And of course, Bill is busy as always with a summer course, a summer TI-Institute and many projects around his house.

Also since the last AfterMath, the Department has gained a good friend as well. Wendy Burnham, our new Administrative Assistant, was hired to replace Lorraine last May. Luckily, she was able to join us early when Lorraine became ill and she has been a tremendous addition to the Department.

### **Alumni News** **By Ted Giebutowski**

Dick Evans ran into Brian Benigni '90 at an ATMNE conference. Brian is teaching at Catherine McGee Middle School in Berlin, CT. Also, as of January, 2000, Scott Evans '88 is an Associate Research Scientist at Harvard Medical School, designing clinical trials for AIDS testing.

Barbara Resch '95 e-mailed shortly after our last issue that she had completed a Masters

degree in curriculum and instruction in May, '98 and entering her second year of teaching seventh grade mathematics in North Carolina. She wrote that: "North Carolina is crying for teachers." A good tip for our recent graduates and others as well. Thanks, Barbara.

Kari Richardson '83 wrote Paul Estes that she is still working at SAS Institute (10 years!). She and her husband Mickey and their K-9 Kids Wynni and Barney hike and bike around their home in Raleigh, NC.

Bob Hayden ran into Michelle Lamarre '96 at the Joint Statistical Meetings in Baltimore last August. She has been working for Data Description in Ithaca, NY, since she graduated. She went to work for them because she was excited about a product they were developing for teaching statistics called ActivStats, which she was demonstrating with some other products at a booth in Baltimore. She has been in charge of developing a version of ActivStats to work in conjunction with the Excel spreadsheet, which just came out. She has been interviewed twice about her career, once by PSC and once by a national organization. Her PSC interview resulted in her inclusion in the most recent alumni magazine "Plymouth", which you should have received this June also; a neat article which you may wish to copy for any prospective PSC math students! Outside of work, she's bought her own house and a pair of overalls to work in the yard. Bob must have made a lasting impression on her!

After teaching High School math for four years Denise Guillette Kretz '82 made the leap to technology. She worked as a Systems Engineer with systems integration companies in Boston for several years, then retired for a few years when the children arrived (2 sons). She's now with State Street Corporation in their Implementation and Planning Management department. Her group manages the implementation of Unix and NT servers. She writes that her Mathematics degree from PSC has served her well. (For some strange reason, we keep hearing that!) She is also a volunteer mentor at North Quincy High School, tutoring a student in Algebra.

Denise also passed on that Cheryl LaChance Marsh '79 is living with her husband and 3 children in Melrose, MA. She and her husband own a Real Estate company in Boston.

Brooke Covey '97 wrote Dick Evans that she is working in the MIS department as an IT Consultant for Summit Partners, a small Venture Capital firm with offices in Boston and Palo Alto, CA. Her job title includes writing and creating reports for the Finance Department, writing short programs to help them retrieve information. She is also doing some web development for the company, which has only about 90 employees. Her previous company had her travelling a lot and was far too big (40,000). Well, Brooke, you sound like a happy camper now!

And Ken Foster '92 e-mailed me with an address change: He and his wife recently bought their first home and now live in Lowell, MA.

Gina Philbrick Masters '73 e-mailed the Alumni office, that she has been 26 years with IBM and has a new position there which involves travelling to Stuttgart, Copenhagen and

Portsmouth (England). Her website (featuring her car!) is:  
[www.geocities.com/motorcity/street/2860](http://www.geocities.com/motorcity/street/2860).

### **Math Ed Happenings at PSC** **By: Dick Evans**

**Central NH-IMPACT Center:** Last year I reported that PSC received a grant from the Center for Enhancement of Science and Mathematics Education at Northeastern University. We have had a very fruitful first year. **Drs. Judy Buck, Ferd Prevost and Dick Evans** have been working with schools and teachers throughout the state on professional development issues, selection and implementation of standards-based curricula, and on grants we wrote and received last year. We have a number of projects set for this summer. For more information about the Center or any of the projects listed below, call Ferd Prevost at 603-535-2487.

**Everyday Math Institute:** This is part of the "**Exploring Elementary School Standards-Based Programs**" grant, which we received from the NH State Department of Education and the Eisenhower Higher Education Funds. We will have 30+ elementary teachers attending a weeklong overview of this standards-based program. A number of the schools who participated in the grant have chosen this program to implement the next few years. The institute will run the week of June 26 — 30. Everyday Math was one of the three standards-based programs we highlighted for this group of elementary teachers during the academic year. The other two programs were Investigations in Number, Data and Space and Mimosa Mathematics. Teachers who attended the yearlong program can receive three graduate credits and those attending only the summer session can receive two graduate credits. The institute will run from 8:30 A.M. to 3:00 P.M. Monday through Thursday and from 8:30 A.M. to 12:00 noon on Friday.

**Mimosa Mathematics Institute:** This is part of the "**Exploring Elementary School Standards-Based Programs**" grant, which we received from the NH State Department of Education and the Eisenhower Higher Education Funds. We will have 25+ elementary teachers attending a weeklong overview of this standards-based program. A number of the schools who participated in the grant have chosen this program to implement the next few years. The institute will run the week of June 26 — 30. Teachers who attended the yearlong program can receive three graduate credits and those attending only the summer session can receive two graduate credits. . The institute will run from 8:30 A.M. to 3:00 P.M. Monday through Thursday and from 8:30 A.M. to 12:00 noon on Friday.

**Connecting Math and Science:** This will be a one-week institute for secondary math and science teachers using Computer Based Laboratory Systems (CBLs) and/or Computer Based Ranger Systems (CBRs) in conjunction with the TI-83 Graphing Calculator. Data will be collected from experiments and analyzed from both scientific and mathematical standpoints. The institute will run the week of June 26 — 30 from 8:00 A.M. to 3:00 P.M. Monday through Thursday and from 8:00 A.M. to 12:00 noon on Friday. For more information **contact Dr. Bill Roberts** at 603-535-2433 or at [wjr@mail.plymouth.edu](mailto:wjr@mail.plymouth.edu). The cost of the

institute is \$275.00 for in-state students and \$300.00 for out-of-state participants.

**Math Connections Institute:** This will be a one-week institute on the secondary standards-based mathematics program, which was funded by a grant from the National Science Foundation. **Dr. Robert Hayden**, of PSC was one of the authors of this three-year program. The institute will provide an overview of the program and its philosophy. Math Connections is an integrated program, which seeks to connect the mathematics students learn to everyday life and to other disciplines. Cost for participating in the program will be \$450.00, which includes two graduate credits, continental breakfasts, snacks, and lunch. . The institute will run the week of July 10 - 14 from 8:30 A.M. to 3:00 P.M. Monday through Thursday and from 8:30 A.M. to 12:00 noon on Friday.

**Math in Context and the Connected Math Programs:** This will be an overview of two middle school mathematics programs. Both programs are standards-based and were funded originally by the National Science Foundation. These programs were two of the three highlighted as part of the grant "**Exploring Middle School Standards-Based Programs**" which we received from the NH State Department of Education and the Eisenhower Higher Education Funds. The institute will run the week of July 31 to August 4 from 8:30 A.M. to 3:00 P.M. Monday through Thursday and from 8:30 A.M. to 12:00 noon on Friday.

**Australian Task Centre Approach to Learning Mathematics:** Charles Lovitt, the former Director of Mathematics for the Curriculum Corporation of Australia will be returning to PSC for his fourth year. Charles will be teaching a two-credit graduate course on using the Task Centre approach to learning mathematics. The course will run the week of August 7 — 11 from 8:30 A. M. to 2:30 P.M. Monday through Thursday and from 8:30 A. M. to 12:00 noon on Friday. The cost for the course is \$496.00 for in-state students and \$540.00 for out-of-state students.

**Principles and Standards for School Mathematics:** The National Council of Teachers of Mathematics released their update of the "Curriculum and Evaluation Standards for School Mathematics" at their annual meeting in Chicago in April, 2000. **Drs. Dick Evans and Ferd Prevoist** will be teaching a course which will review and discuss the implications of the new standards. The course will meet Tuesday and Thursday evenings from 6:00 to 9:15 P.M. beginning on June 27 and ending on August 3. The cost for the course is \$496.00 for in-state students and \$540.00 for out-of-state students.

### **Awards 2000 By Paul Estes**

#### **Graduating Senior Awards**

This spring at Last Convocation the department honored Jennifer Bonang from Warwick, RI as its outstanding mathematics education graduate. Jen completed her student teaching in December and then began a full-time teaching position immediately in January.

Raleigh Lapierre from Haverhill, MA was designated as the outstanding actuarial mathematics graduate.

### **Mathematics Department Fellowship**

The Mathematics Fellow for fall 2000 will be Scott Laine from Spencer, MA. This fellowship involves working in the Math Activity Center helping students with problems in Calculus and Elementary Functions. As the recipient of this award, Scott will receive a stipend, which will be credited to his tuition.

### **Mathematics Scholarships**

Robin Lubguban from Franconia won the Barbara Dearborn Mathematics Scholarship. Again this year, Barbara's daughter Mitzi Dearborn returned from Wisconsin to make the presentation.

We were able to award three Geneva Smith Scholarships this year. Geneva Smith was the former Math Department professor for whom Smith Residence Hall is named. The three Geneva Smith Scholarship recipients are Michael Severino from Pike NH, Brian Harrington from Northfield NH, and Anthony Koschmann from Hudson NH.

### **Integrating Technology Into Our Majors By Bob Hayden**

At its last meeting of the academic year, the Department adopted a plan for integrating technology into our undergraduate programs. Probably the most notable change will be the integration of a computer algebra system into the teaching of Calculus I and II. This will mean that all students taking those courses will learn how to use a CAS, and can use it in subsequent courses. The plan was partly in response to the recommendations of Don Kreider of Dartmouth who performed a review of our programs in the spring of 1999. He noted a lack of uniformity in the use of technology among different offerings of the same course, and recommended that we adopt policies to make multiple offerings of the same course less variable. During January of this year, the Department held a daylong retreat to discuss this and other issues Don raised. A committee was formed consisting of myself, Judy Buck, and Ted Giebutowski to develop recommendations on technology use within our programs. There were a variety of viewpoints within the committee and within the Department on how this should be done, and the proposal represented an attempt to address as many of these as possible.

The three principal reasons for integrating technology were:

- to allow students to investigate mathematics in greater depth by facilitating coverage of topics for which pencil and paper calculations would be impractical
- to provide students with skills useful in their future jobs (A survey of our graduates carried out by then-students Rob Cilley and Danielle Paturzo indicated that many

graduates felt we did not provide them with the technology skills their employers expected.)

- to enhance teaching by helping students to visualize and explore mathematical ideas.

Most undergraduates at PSC now take a one-credit course called Introduction to the Academic Community. In many years, it has been possible to offer a section for mathematics majors. We hope to continue to do that. The course normally includes an introduction to the computer facilities at PSC. We hope to include in that for our majors an introduction to spreadsheets and to mathematical word processing. We hope also to eventually include the use of spreadsheets in our Mathematics of Money and Finance course.

One of the more difficult issues for the committee was the role of graphing calculators. While these are widely used as a pedagogical aid, and are an essential tool for future teachers, they are not widely used outside the classroom. As a result, we needed to find a way of integrating them that would serve both our teaching and non-teaching majors, as well as other majors in our courses. Our recommendation was to integrate them into our Elementary Functions course, which all Mathematics Education majors are required to take. In addition to reviewing essential material, future teachers will also be given a role model for the appropriate use of technology in teaching that material in high school.

We faced a similar issue regarding dynamic geometry software, which is essential for future teachers but not for those who will not teach. Fortunately that issue had already been resolved some years ago by integrating such software into our Geometries course.

During the Department's discussion of the committee's recommendations, Chair Jon Maatta read a recent change to the certification standards for teachers in NH stating that future teachers should be able to use technology appropriately and effectively in the learning and teaching of mathematics, including, but not limited to: Scientific and graphing calculators, computer-based laboratories, the Internet, and computer software (CAS, Dynamic Geometry programs, spreadsheets, and Statistics software).

For statistics, the use of a statistical package will now be a part of all sections of Statistics I.

As a first step in implementing its recommendations, the committee sponsored a grant proposal to support work over the summer on integrating a CAS into calculus. Bill Roberts will be updating materials he has used previously for use with the latest version of Mathematica. Judy Curran Buck will be developing similar materials for Mathcad. Bill will be using his materials in calculus starting this fall.

### **My Sabbatical Semester in Potsdam, New York By Bernadette Russek**

The school year 1999-2000 was my seventh year at Plymouth State College and was my sabbatical year. I spent a wonderful fall semester with the mathematics department at the

State University of New York (SUNY) in Potsdam, New York. The SUNY Potsdam department is known nationally for their very high number of math majors. This math department has gained national recognition for their efforts and success in attracting and retaining students. While nationally approximately 1 percent of the graduating seniors are mathematics majors, at Potsdam approximately 10 percent are. The natural questions are: "Why?" and "Can P. S. C. do this?" It would be valuable for us to get some insight into the issues and the possible approaches to also assure the success of our students and of our department. With this in mind, I conducted a study in Potsdam to discover what they do to attract, recruit, and retain their students; I sat in on classes, taught classes, talked to the faculty and students, went to meetings, observed, and recorded my findings.

Much of what distinguishes the program at Potsdam is not what the department "does" so much as the way it "thinks" — a matter of attitude. The vision of preparing students for success shapes and guides the actions that occur as part of the working day. In the MAA *Monthly* article "A Modern Fairy Tale", J. Poland summarizes the recipe for success at Potsdam. He says, "It is very simple: instill self-confidence and a sense of achievement through an open, caring environment." Potsdam faculty "teach at a pace which allows students time to struggle with the problems and resolve them, rather than primarily to cover material..." This last feature suggests that Potsdam doesn't suffer from the tyranny of a syllabus, which in some educators' opinions accounts for many students' attitudes toward learning of mathematics as well as the shallow learning of it.

Responses from this year's students in interviews and questionnaires confirm that the Potsdam strategy is working. When asked questions such as: "What makes successful and happy Math majors?" and "What makes a successful Mathematics Department?", the students described aspects of the Potsdam model that were important to them: "The faculty cares about us", "they want us to succeed", ". . . always available", and "We feel comfortable here, at home." In addition, many students cited the high academic expectations together with a supportive environment, which were the keys to their success as math majors. What is so interesting when one describes this "Modern Fairy Tale" is *how* all this is put into practice. The ten Potsdam math professors have demonstrated their regard for the students in many different ways, from providing comfortable chairs for waiting students to lining the halls honor placards. There are three student work areas in the math department area. One is a math lab for extra help by peers. A second one is a 'lounge' with tables, a blackboard, and extensive collection of books and journals. A number of times I have seen students in this room with lunches spread out working together on their "problem of the week" from Set Theory & Logic class. The third room, whose walls are covered with student pictures of initiations in honor societies and pictures at the department picnic, has tables, a refrigerator, and a microwave, where students can keep and prepare snacks.

There have been many articles and a book published on the "Potsdam Model". I can only give a very brief description, a brief hint, of the remarkably successful mathematics program at SUNY Potsdam. Perhaps it is a combination or the right configuration of many factors that make the program so successful. In a college of approximately 4000 students, 112 are math majors (students don't choose their majors until their Sophomore and Junior years).

The Potsdam Mathematics Department offers us many excellent ideas to consider as we in the Plymouth Mathematics Department continue our efforts on this issue.

**Editorial Comments**  
**By Ted Giebutowski**

One of the ideas I floated to the department in preparation for this issue was to put in all of our email addresses; they now appear in the AfterMath heading. We generally post letters and e-mails that we get from alumni for the rest of the department to see; also, usually the recipient sends me a copy for the next Alumni News column (so if there's anything you don't want me to blab about, just say so!). Feel free to use Wendy's email addresses to ask about old friends' addresses, make a change of your own address (she will also notify the Alumni Office), etc. In addition our web page is at: [www.plymouth.edu/psc/math/index.shtml](http://www.plymouth.edu/psc/math/index.shtml); We continue to upgrade it and welcome suggestions (to Wendy or Jon). And those of you in the teaching biz are encouraged to have your students surf our web page, too!

For those of you who have any contact with a prospective student (**not** just the teachers among you!), we still appreciate any good word you can pass on about PSC and the department, maybe you could even pass on a copy of this newsletter with its examples of student successes.

For those of you thinking about taking an evening course for graduate credit we are offering this fall both MG 323, Geometries (Roberts), and MG 451, Advanced Calculus I (Ferland). In the spring we will offer MA 422, Topics (to be announced), and MA435, Probability Theory, plus (probably) MA330, Statistics II.

Lastly, my apologies for not having a student column; I just forgot. However, Jon Maatta has included a sketch of the MAP (Mathematics Association of Plymouth) in his chair's column and Paul Estes' column lists the awards our students have won this year. I'll remember next year!

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