

# Computer Science Club 

A Student Chapter of the ACM

## CSC Frosh Flash

Greetings, little froshlings. I have been asked to speak a few words to you, in order to educate you on the many fine points of life at the University of Waterloo; particularly, to enlighten you about the CSC. Of course, you will be reading this, so I will not actually be speaking to you - just try imagining that a I *am* speaking these words to you (if you have never heard a dalek speak before, this may require some concentration).
Just what is the CSC, you ask? It's the University of Waterloo Computer Science Club! Our office is located at MC3036, just across from the Right Angle Cafe. We are a student chapter of the Association for Computing Machinery (ACM), and we promote the awareness and appreciation of computer science in the university community. To this end, we hold several special events and talks in a term. Here's just a little bit of what we have planned for Fall'00.

## SIGGRAPH '99 Viewing

## Thursday, September 14. 19h00-00h00

DC1302

A compilation of entries for the ACM's special interest group on computer graphics (SIGGRAPH) conference. Includes animations used in commercials, films, art pieces, architectural and scientific simulations. Don't miss this!

## UNIX Tutorial I

Tuesday, September 19th and Thursday, September 21st. 17h00-19h00 MC3006
Meant as a tutorial for those without any knowledge of how to operate in the UNIX environment. Covers how to read electronic mail and newsgroups on your undergrad account, plus other useful topics.

## UNIX Tutorial II

## Tuesday, September 26th and Thursday, September 28th. 17h00-19h00

Held the week after UNIX Tutorial I, covers basic file and directory manipulation and navigation.

This is only the tip of the iceberg. Be sure to check for posters around the MC that will tell you more about these and others exciting events we have planned.
-Calum T. Dalek -CSC Chairbeing

## ACTSCI Club

For information, see someone in MC3030

## The Pure Math, Applied Math, and C\&O Club

Hello frosh!
So you're just starting in the mathematics faculty of the University of Waterloo. Do you actually enjoy math or is it just something you're going to
 do to get a degree? If you like number and logic puzzles, writing math contests, or have ever studied a mathematical concept for the enjoyment of it, the PMAMC\&O club is for you.
The Pure Math, Applied Math, Combinatorics and Optimization Club has many services which it offers its members. There is a club room (MC 3033) where members can meet to socialise. There are many journals and reference books available for your reading pleasure. Perhaps best of all, there are usually smart upper year students there who are more than willing to help explain and discuss difficult concepts.

The PMAMC\&O club also sponsors frequent entertaining and informative talks on mathematical subjects, by both faculty and students. You'll soon come to realise that math lectures can be boring, but math talks are stimulating and fun. The club even provides free pop/juice and snacks at the talks.
You don't have to be in Pure Math, Applied Math, or C\&O, to join the PMAMC\&O club. We have members from all of the various math departments. You don't even have to be good at math to join the PMAMC\&O club. All you need is to be social, outgoing, and able to derive some enjoyment from mathematics.
We'll be having an organizational meeting early this term, so keep your eyes out for posters advertising the meeting. Come by, elect the club executive, grab some free food, and find out what the club's about!

## MGC

Greetings from the Math Grad Committee, and congratulations on getting into Waterloo. Now, I'm sure you are asking yourself, what does a grad committee matter to me? I'm not graduating until 2005. Well, that's a good question.

Although most of the MGC's activities are geared towards students in their last year at UW, such as the Grad Ball and the yearbook, we also have much to offer to everyone, including Frosh.

Perhaps the most noticeable thing we do is our weekly pizza day. Every Wednesday, we sell Domino's pizza in the third floor hallway of MC. Buy a button and get a special deal! We also run a variety of social events, organizing trips to Wonderland, Stratford and other fun places, often extending an invitation to all students.
Once you are getting close to graduation (or even before then), stop by our office (MC 3029) to get information on what you need to do to graduate, grad schools, and job opportunities for budding mathematicians. Or just stop by if you want to chat, or help out. In a few years time, the office might even be yours.

Dan Pollock
MGC Co-Chair 2001

## Fall 2000 Exec

Prez<br>V-Prez Activites \& Services V-Prez Finances V-Prez Academics<br>Jennifer Cote Corey Gaudette Nick Page Vacant

## VPAS Sez

mathNEWS bigwig Greg Taylor has generously informed me that the Frosh 2000 issue of mathNEWS is soon to be read by all of you coming to the University of Waterloo Mathematics Faculty this September. Far be it from me to pass up this golden opportunity to welcome all of you to the building that has served as my home away from home away from home for the past four years. Yeah, I'm old, I know.
First, let me tell you a little about myself. My name is Corey Gaudette, but just about everyone around here calls me Ike. I'll be serving as your Vice President of Activities and Services (VPAS) for the Fall 2000 term. While I'm doing that I'll be in charge of such great things as the Mathsoc office, social events, movie nights, mathletics and more. You'll find out more about what Mathsoc can do for you once you arrive, but here's a quick list of what you can expect.

THE MATHSOC OFFICE - This is where most of Mathsoc's services can be found. Here you can get 5 cent photocopies, copies of old exams, Mathsoc novelties and a bunch more. The office is staffed by volunteers and would not exist without them (more on that later).
SOCIAL EVENTS - These are events run by Mathsoc and Mathsoc volunteers to entertain you and make sure you're not losing yourself in your studies. Movie nights are the most frequent of them, and for only two dollars, you can watch two movies! Good ones, too, not stuff like "The Baseball Brat and his Big Bat". Also keep an eye out for Pub Night, Cove Nights (the Campus Cove is the resident arcade and pool hall), and also things like "Who Wants to be a Millionaire?", which I run myself once a term.
MATHLETICS - Join a sports team and compete for... well... fun, I guess. There are mini-leagues for just about any sport imaginable, and any team that we can field is eligible to compete.
LOCKERS - Mathsoc maintains a sizable bank of lockers that you can sign out and use for the term. Useful for when you just don't want to lug those heavy textbooks home.
FOOD - Mathsoc owns the Right Angle Cafe and Coffee and Donut Shop across the hall from the Mathsoc office. Good food at a very reasonable price. I recommend the beef stew. Yummy!
You get the idea. However, as I have said before, none of these things are possible without a healthy staff of Mathsoc volunteers, so plan to become one once the term officially begins. Let me just get off a couple of blatant plugs before I leave you.

- Read mathNEWS, it rules.
- Volunteer for Mathsoc, then you'll rule.

Some of you will get the opportunity to meet me during Frosh Week, when I host one of the events for the scunt. As for the rest of you, you will usually be able to find me in either the Mathsoc Exec office or the comfy lounge.

Corey Gaudette
F2K VPAS, Millionaire Mark and all around... uh... guy.

## Prez Sez

## Hi Everyone!

Welcome to Math @ the University of Waterloo. There is a lot to find out about in your first few days here so I will keep this short. My name is Jennifer Cote and I am the MathSoc President for the Fall term. I would like to invite you to come out and find out what the Math Society can do for you. We offer many services such as student representation, social events, movie nights, 5 cent photocopies, a huge bank of old exams, and computers. There are many ways to get involved from being a class rep, sitting on a committee, or just volunteering to help out in the office or with an event. Our big activity in the Fall term is our Charity Ball. This is a semi-formal event that raises money for the Food Bank of Waterloo Region and the FEDS Food Bank. We need people to help us get sponsorship, decide on a theme for this year, and help with the decorations. If any of these things interest you, or you are just curious and want to find out more, watch for signs on the white board outside the C\&D (Right Angle Cafe) for more details in the next couple of weeks.
If you would like to find out more about the Math Society in general please stop by the executive office, MC3039, and I would be happy to talk to you about this... or really almost any other topic. See you then,

Jennifer Cote MathSoc President Fall 2000

## Advice From The Math Orientation Director

Greetings from the Math Orientation Committee! It is the beginning of Orientation Week 2000, and you are new Frosh wondering what is in store for you; not only throughout the week, but also throughout the next several years. Below are a few pieces of advice about what's ahead.
Let's start with advice about Frosh Week. First of all: HAVE FUN! Enjoy the week. You're about to start what is most likely the biggest undertaking in your life so far: becoming a university student. It'll be busy, so relax! Take in your new surroundings, and again, have fun. The second (and final) thing is to make friends. These are the people you will be seeing in the coming years, and they will be of invaluable help to you. Be it with your studies, or personal issues, people to talk to are extremely important if you expect to survive here.
Also, as you are just starting here, you probably have a few questions: Exactly how does co-op work? How do classes work? Do we have homework? Where the hell can I get food around here? What's Village like? Etc... You need an incredible resource to answer these questions. Well, that resource is at your mere call: Frosh Leaders. Your leaders are upper-year students who have been through it all (well... most of them anyway). Ask them. You'll be truly amazed at what they know, and if your leaders don't know, they'll find someone who does. It's been said many times before, but it can never be said enough: Information is power. So don't be afraid to ask questions.
Now that I've babbled enough, enjoy the rest of the issue, and enjoy your week.

Nadia V. Ursacki
Math Orientation Director 2000


## In The Beginning

Once upon a time, in a land they would soon call Waterloo, a farmer wandered into his field to tend his crops. All of a sudden, he heard a voice:
"Build it and they will come."
Thinking it was just the wind, he went back to tending his crops. Then he heard it again:
"Build it and they will come."
At this point, he pledged to cut down on the drinking and to stop talking to his livestock. So he went back to tending his crops. And then the voice spoke again:
"Yo, pal! I'm talking to you! Build it and they will come! Are you even listening to me?"
"Yes, I heard you! But build what? What am I supposed to build?" he answered.

But the voice did not reply.
He pondered for awhile what it was that he had to build. A new barn for his livestock? An addition to his house? A baseball park? A great university? He didn't need a new barn nor an addition to his house. And seeing as building a great university by himself would be difficult, he decided to build a baseball park. For weeks, he was ridiculed for plowing under half of his crop just to build a baseball park that some voice told him to build. Ya know, when you think about it, it does sound kinda stupid. Anyways, after it was done, nothing happened. No one came to play baseball. No ghosts of dead baseball greats came to visit. And winter was coming. Only half a crop. Mortgage to pay. Mouths to feed.
"I built it! So why haven't they come?" he screamed.
Suddenly, the voice responded.
"You idiot. You should have picked the fourth option. Build a great university. Do I have to spell out EVERYTHING for you?"
After feeling insulted, he went into his house and started drawing up plans for a great university. Unfortunately, his only ideas were a long driveway, a sizeable parking lot and a big building with a sign that said "University". This wasn't going to be an easy task.
The mortgage was due. He decided to sell his farm and all the surrounding land to people who would have some clue on how to build a university.
And then it begun.
Over the next few decades, buildings started popping up all over the place. The university was starting to take shape. Enrollment went up and up. They were coming. And then some.
Everyone wanted to come to this great university built on farm land where farmers would hear voices. Despite this fact, people were coming here. There were reports the people who were coming here were hearing voices. But no one really knows for sure. However, the first degree they handed out here was to a dog. There's a good chance that some weird voice told somebody to do that.
Today, the university hands out degrees to people. What started as an empty farmer's field has turned into a bustling student environment and community. And the voices? Well, if anyone's hearing them, no one is admitting it.
And whatever happened to that farmer? Not sure. Probably took the money and ran. Maybe he's still hearing that voice.
But that's another story.

## mathNEWS Advice: DON'T PANIC

This is the story of a publication, a publication called mathNEWS. Not only is it a wholly remarkable publication, it is also a highly successful one - more popular than most lectures on Friday mornings, better selling than course notes for STAT 231, and more controversial than Skip's trilogy of research papers 'Where Davis Centre Engineers Went Wrong', ‘Some More of Engineering's Greatest Mistakes' and 'Who Are These Engineer People Anyway?'
The Imprint defines mathNEWS as 'rough-edged, put together by people unconcerned with layout'.
Curiously enough, an edition of mathNEWS that had the good fortune to fall through a time warp from a thousand years in the future defined Imprint as 'just another campus publication', with a footnote to the effect that editors would welcome inquiries about any of the vast number of campus publications that started publishing after mathNEWS was established back in 1973. In fact, mathNEWS has been publishing and parodying many times over many years and under many different editorships. It contains contributions from countless numbers of mathies and professors. Your introduction begins like this:
'University,' it says, 'is big. Really big. You just won't believe how vastly hugely mindbogglingly big it is. I mean you may think it was a long way down the hallway to the high school cafeteria, but that's just peanuts to University. Listen ...' and so on.
(After a while the style settles down a bit and it begins to tell you things you really need to know, like the location of the Math Tutorial Centre on the fourth floor, the fact that you can reach the DWE building without ever going outside, and how to find any room on the sixth floor of MC by using the map which can normally only be read by someone with the mental
capacity for calculating probability forcasts based on improbability data: something which even most of the statisticians who have offices up there are still pretty hazy about.)
mathNEWS also has a few things to say on the subject of pink ties.
'A pink tie,' it says, 'is about the most massively useful thing a Waterloo mathie can have. Partly because it has great practical value - you can wave it in the air to help get you noticed in a crowd, flick it at people who invade your personal space, use it to hold open doors as is done in MathSoc, tie it over your eyes in the hopes that if you can't see the professor he won't call on you for the answer, tease the squirrels with it, employ it as a gag or rope to restrain someone who may be particularly annoying you, and of course wear it to public functions if it still seems to be clean enough.
'More importantly, a pink tie has immense psychological value. For some reason, if a potential employer discovers that a Waterloo graduate has a pink tie with them, they will automatically assume that $\mathrm{s} / \mathrm{he}$ is also in possession of a mechanical pencil, ballpoint pen, calculator, palm pilot, library of textbooks, laptop, web access, caffeine supplement, copy of mathNEWS etc, etc. Furthermore, said individual will then happily hire the mathie, providing them with any of these or a dozen other items that the mathie might accidentally have 'lost'. What the employer will think is that any person who can survive three, four, five or more years in the Math Faculty at the University of Waterloo, obtain their degree, and yet still know where their pink tie is, is clearly somebody to be reckoned with.'
mathNEWS sells rather better than the Co-op Work Report Guidelines. In these enlightened days of course, no one believes a word of it.

## Seriously though... what's this math NEWS?

Well, mathNEWS is the University of Waterloo Faculty of Mathematics Student Newspaper. (Or publication, or magazine, or newsletter... whatever the editor feels like calling it.) We publish about every two weeks, usually on Friday, and contain articles written by people just like yourself! Being student funded (some of your MathSoc fee goes here) and a volunteer publication, we are always in search of people who can write. Or draw. Or proofread. Anything, really. We'll even bribe you to come out to production nights every other Monday with free food. You don't need any experience, just interest. Plus you'll get to see your name in print!
The content of mathNEWS itself will vary from term to term depending on who's editing. However, there is usually a mathNEWSquiz, a gridWORD and profQUOTES. The former two offer prizes for correct solutions. The profQUOTES are a collection of actual quotes as uttered by actual professors during actual lectures. Look for those elsewhere in the issue. In terms of other articles... well, have an opinion you want to express? A weird proof you thought up? Something that you think is funnier than what we're printing? A solution to one of our puzzles? Then if you're too shy to come out of an actual production night, submit such things to us by emailing mathnews@undergrad.math. uwaterloo.ca or by dropping your submission into the BLACK BOX on the $3^{\text {rd }}$ floor (across
from the lounge).
In the past, mathNEWS has on occasion gone nuts and put out a parody issue like the recent Daglobenpost, the not-sorecent Irrational Toast and Toronto Numb, and the out-of-sparecopies Impotent. It doesn't happen often because those things take a lot of time and effort, but if you're nice to the editors they may give you a complimentary copy. Oh, and yes, mathNEWS really has been around since 1973. (Issue 500 was another issue that took time and effort.) Feel free to drop by our office (MC 3041) when it's open to look at our mathNEWS Gallery/ Shelf o' Memorabelia, which includes among other items: a piece of Red Room panelling, an EMS Library Sign dating back to before the books were moved off the fourth floor of MC into the "new" DC building, and a silk screen from Math Frosh Week 1979. You can even just come by to say 'hi' or drop off an article in person.
Oh yes, and we have a web page, http:// www. mathnews. uwaterloo.ca/ You can find past issues there and maybe learn more about us. So enough rambling... the mathNEWS DISorganizational meeting will be held during the first week of classes in September. That's when we see about getting our act together for another term. Hope to see you there!

Greg Taylor Editor

## Course Selections

Since you probably don't have much of a clue what your courses will be like, the staff of mathNEWS has put together the following list (mostly at the last minute and at great personal expense) to help you out. It's now being recycled into this issue by the current editor who really didn't feel like expending great personal expense upon said list himself. Included are core first year courses and popular electives. If you have any questions about some of these courses, try to track down someone who's taken them.

- ACC 121/122: Accounting for non-accountants. Easy if you've taken accounting in high school (in fact if you have OAC Accounting you leap right to ACC 122) although there are some new principles.
- BUS 111/121: Taught at WLU, these courses teach you the basics of the business world. Business courses are WLU's specialty, and these two are always taught.
- CHEM 120: Introduction to Organic Chemistry. You need OAC Chemistry and Calculus for this one. Quarter credit lab available (CHEM 120L).
- CS 120: Using computers for problem solving. For incoming mathies who have little or no computing experience. If you have some, we would suggest...
- CS 130: For those who do not have "substantial" programming experience (whatever that means). Basically, if you know some programming, take this. You'll be using Java.
- CS 134: Continuation of CS 130. You can take this course first if you want, but you better know a lot about programming.
- DRAMA 223: Public speaking. Learn about it, deliver some prepared and impromptu speeches and get videotaped to see what you personally need to avoid so that you're taken seriously out in the work force.
- ECON 101/102: Microeconomics/Macroeconomics. All the economics a non-major needs. Easy to pass, hard to ace, lots of reading, required for actuary majors.
- FR 151/152: Basic French. Emphasizes comprehension, grammar and basic speaking skills. If you've taken up to Grade 10 French, take FR 151. If you've taken up to Grade 11 or 12, take FR 152. If you have OAC French, or come from an immersion program, look into...
- FR $192 \mathrm{~A} / \mathrm{B}$ : Continuation of OAC French. A little more intensive than FR 151/152, but can be fun at times.
- MATH 010: This is just a course that turns up if you're enrolled in certain first year math courses. No credit involved, it's simply a slot used for writing midterm tests and the like.
- MATH 135/136: These are the first year algebra courses. MATH 135 covers such things as number systems and some cryptography. MATH 136 covers vector spaces, linear transformations and matrix algebra.
- MATH $137 / 138$ : These are the first year calculus courses. Derivatives, integrals, differential equations and sequences. Builds on OAC material.
- MATH 145/146/147/148: Advanced versions of the above. More emphasis on theory. Only for you really, really smart folks.
- MTHEL 100: Commercial and Business Law for mathies. Pretty much says it all. Multiple choice tests too!
- MTHEL $305 \mathrm{~A} / \mathrm{B}$ : Intro to Life Insurance. Exactly as excit-
ing as it sounds, but "strongly recommended" for you AciSci wannabes.
- MUSIC 100: Intro to Music. History of music through the ages. Since it's also a music appreciation course, you do a lot of listening and you get to do concert reviews too.
- PHIL 145: Critical thinking and argument analysis. Interesting and easy.
- PHYS 121/122: Physics, with quarter credit labs on alternate weeks. Continuation of OAC Physics. Some find it easy, some find it tough. Required for you Applied Math wannabes.
- PSYCH 101: Intro to Psychology. Interesting, lots of memorization. Easy to pass, hard to ace, and you'll probably get to participate in some psychology experiments.
- SCI 205: A 'Hi-Fi-Sci' course that teaches concepts about acoustics and equipment. Not sure how hard it is these days, but requires only a year of Secondary School Physics.
- SCI 238: Astronomy, open to students in all years. Difficulty depends on instructor. Plenty of formula plugging, basic math and reading, plus you'll likely get to see the observatory on the roof.


## lookAHEAD

mathNEWS
September 4
September 13
September 18
September 22

## Math Faculty

September 8
September 11
September 22
October 9
November 1-3
November 3
December 4
December 6
December 7
December 21

## Miscellaneous

September 4
September 10
September 20
October 9
October 6-14
October 13
October 23
October 29
October 31
November 11
November 17
December 20
December 25
December 26
December 31

Resurrection of the Frosh Issue Disorganizational Meeting? Issue \#1 production night 6:30pm, MathSoc (MC 3038)
Probable date for Issue \#1
ELPE exam, PAC
Lectures Begin
Course Add Deadline
Course Drop Deadline
Spring Term Pre-Registration
Course Withdrawal Deadline Lectures End ELPE exam, PAC
Examinations Begin Examinations End

Labour Day
Surprisingly Important Day
Reality Sinks In
Thanksgiving Day
Oktoberfesting
Friday the $13^{\text {th }}$, Muhahaha
Probably a Midterm Day
Set Your Clocks Back!
Halloween
Remembrance Day
Some Assignment will be Due
Day of Exam Schedule Annoyance
Christmas Day
Boxing Day
The REAL end to the Millennium

## Fees

## (and other four-letter words)

When you first looked at your fee statement, you probably noticed several things. You noticed that it was white and dark green. You noticed that it had your name printed on it. Then you noticed the box underneath the label "Balance to be paid". After regaining consciousness, you may have finally spotted the many smaller fees that make up the whopping total, wondered what they all were, and whether you really had to pay them all. Well, you don't actually have to pay them all... but on the other hand, if you didn't send in your money by August 29, 2000, you now have a late fee of $\$ 50$ to deal with (assuming you're a full time student). That goes up to $\$ 70$ on the first day of classes. Then it keeps going up by $\$ 20$ through September. Pay your fees! Then consider the following...

## Fees You Have to Pay

- Tuition: This is the basic tuition fee, which covers the basic costs of the courses you'll take for the next four months. Individual courses may have other costs associated (lab fees come to mind), but most course costs are covered by this fee.
- Co-op Fee: All co-op students pay this fee to cover costs the university incurs in handling the co-op program. Supposedly, the salaries of co-ordinators, bookkeeping costs and other items are paid for by this fee. In fact, the university sets this fee, not the people in co-op, so don't complain to your coordinator that you're not getting your money's worth. This fee must be paid by everyone in co-op, regardless of whether or not you go through interviews in a given term.
- Work Rpt Marking: Another co-op student fee. This fee is paid every term, whether or not you submit a work report to mark.
- Health Insurance: This insures both you and the university. The health insurance you buy helps cover insurance costs for the university, and you get a discount when buying prescription medication (even on work terms) among other things. For more details, go over to Health Services and pick up a brochure. (Actually, it is possible to get this fee back if you can prove that you are currently covered under a better plan than the one the University is offering, but that will involve paperwork.)
- Federation of Students: All undergraduates at UW belong to our Federation of Students, the "Feds". They provide lots of services, like Scoops ice cream, two pubs, legal services, Fed. Buses to Toronto and more. Their office is in the SLC.
- Federation Hall: This fee goes towards paying off the student pub located on campus near Village 1. (Fee was approved by student referendum back in 1983.)
- Student Co-ordinated Plan: A $\$ 900,000$ endowment fund, a new North Campus Recreation Complex, and a new Student Life Centre were created for use by the students for the improvement of student life. This fee now goes to pay the mortgage on the Rec Complex and the SLC.
- Student Service Fee: This fee is basically another name for ancillary fee. It covers some of the costs associated with services provided on campus that the government has
deemed unworthy to fund (including but not limited to the Walk Safe Program, Career Services and Personal Counselling). That's government cutbacks for you.
- CanCopy: This fee is to pay the CanCopy license, so that you don't get sued for copyright violations while you're photocopying textbooks for essays and class projects. Assuming you do it under the provisions of the license. Something like that.


## Fees You Can Get Back Later

These remaining fees can be refunded by applying to the appropriate organizations within three (3) weeks after the start of lectures for the term. Of course, most of these fees support interesting and worthwhile organizations, which are run by and for students. They would probably love to have you join them and help them out.

- Imprint: This is the campus newspaper, published every Friday. The quality of the paper is directly attributable to those working on it, and the quality goes up and down, but it usually contains information of immediate relevance to the student population.
- Radio Waterloo: The on-campus radio station. CKMS 100.3 FM (in stereo), it provides a wide variety of programming over a range of musical styles and subject matter.
- Waterloo P.I.R.G.: The Waterloo Public Interest Research Group, WPIRG, is a student funded public affairs group which has studied such things as nuclear waste and acid rain.
- Student Society: This is your Math Society (MathSoc) fee. Look for more information in your Math Handbook and in this issue on page 3. (As $\$ 3$ of this fee comes to mathNEWS, if you get it refunded we're probably within our rights to repossess your Frosh Issue.)
- Student Endowment Fund: In your case the Math Endowment Fund, this money is spent on "projects to enhance the academic life for mathematics students at the University of Waterloo", as decided by the students themselves. Refer to your Math Handbook for details about MEF.


## What is FASS?

We are FASS. A fun-loving collection of UW Faculty, Alumni, Staff, and Students, who have banded together since 1962 to write, produce, and perform an annual musical-comedy!
Some people say we are a theatre company who likes to socialize. Other people say we are a social club that likes to put on a play. In either case, we'll have auditions in the first week of January (3-5) on the third floor of Hagey Hall, and the play is put on in February (1-3) in the Humanities Theatre. (In the meantime, there's meetings held to write the script!)
So if you'd like to write, sing, act, paint, build, sew, publicize, or just party - Join us for FASS 2001!! You can have a look at our bulletin board in the SLC for information, check out the FASS website at http: //www. math. uwaterloo.ca/~fass, and contact us through email by mailing fass@math. uwaterloo.ca. (Note: FASS is a campus wide organization so invite your friends in other faculties to join too!)

## Restaurant Reviews

In Volumes 74, 76 and 82 of mathNEWS, Jonathan Ezer wrote restaurant reviews for a lot of places both on and near campus. Included here, for your benefit, are brief excerpts from these articles along with his seven "asterix" ranking. Bear in mind that some of the reviews at the top are over two years old and you should never forget you also have a mind of your own. As to the addresses, just ask around, people know where these places are. The Editor would also like to add a plug for Mr. Greek Jr., who are very friendly, have good chicken souflaki and have put up with mathNEWS through a couple production nights.

- Gino's Pizza - The selection of slices is impeccable. The food is delivered fast and hot. Nowhere else near UW can one receive good food and drink for such a low price. Congratulations to Gino's pizza for top-notch service, quality and, most definitely, price.
Asterix Rating: ******* (out of seven)
- Subway - I was not impressed. The atmosphere is clean and there are pretty images of Subways (the train variety) adorning the walls. Nevertheless, the chairs are uncomfortable. At this price, I have come to expect a waitress/ waiter or very high quality food. I received neither.
Asterisk Rating: ** (out of seven)
- Olympic Gyros \& Subs - At Olympic, high quality food is the number one attraction. The atmosphere is pleasant, offering very comfortable chairs in a homey dining room and a patio which is an added bonus in the summer time. The food is not cheap but the added price is pardoned given the high quality and good service.
Asterisk Rating: ****** (out of seven)
- The Mongolian Grill - There are a few menu items but the main attraction is an all-you-can-eat buffet. The patrons fill up small bowls with items of their choice and then the mix is cooked at "center stage" while-you-wait. The staff is very courteous, the food is very good and the meat and the vegetables are obviously fresh. However I am still not sure how I feel about the concept.
Asterix Rating: ****** (out of seven)
- Brubaker's (in SLC) - The atmosphere is definitely a positive but I can't stand those ridiculous prices. Every employee is kind to the customers and treats us with respect. It is almost as if they know we are getting ripped off and feel bad about it. While it is sometimes fun playing Russian Roulette with my lunch, I can't stand those God Damn prices.
Asterix Rating ** (out of seven)
- Mel's Diner - At Mel's Diner, the prized attraction is the atmosphere. Mel's specialty is the all-day breakfast. Dining at Mel's feels like an event or an outing as opposed to an opportunity not to cook for yourself. It's fun, entertaining, and, if you know what to order, can be gastrointestinally satisfying.
Asterix Rating: ****** (out of seven)
- Jose's Noodle Factory - Formerly Louie's Lodge, Jose's Noodle Factory provides an eclectic mix of motifs. The service is excellent. Wait staff seems to have a knack for knowing when they're needed and knowing when they're not. A good place to treat yourself or a friend.
Asterix Rating: ****** (out of seven)

Bon Appetit (aka Davis Centre Cafeteria) - Tsk Tsk Tsk! Food Services, you have incurred my wrath again. What is up with those ridiculous prices? Most of the staff at the Bon Appetit are quite congenial, except that a few bad apples can spoil the bunch. The sauce for the chicken balls was tasty but did not excuse the otherwise sordid affair. Asterisk Rating ** (out of seven)

- East Side Mario's - East Side Mario's provides a New York charm in the heart of University Plaza. For those on a tight student budget, the unlimited nature of the salad allows to it play the dual-role of appetizer as well as dessert. The employees are full of smiles and are eager to please. The prices at East Side Mario's are very reasonable.
Asterisk Rating ******* (out of seven)
- The Pita Factory - While not the cheapest meal in town, the Pita Factory definitely provides good return on investment. The service and atmosphere were above average. I would have preferred it if I had tasted more meat and less cucumber but I suppose it is the veggies that give a pita it's impressive girth.
Asterix Rating: ****** (out of seven)
- Math C\&D - By outsourcing preparation, selecting a large mix of foods across dimensions time and space, and laying out the goods with kick-ass prices, the Math C\&D is a microcosm of life on planet earth in the information age. My only knock on the C\&D dining experience is that the dining room looks tres drab.
Asterix Rating: *** *** (out of seven)
- Morty's Pub (before new location) - They are simply the best chicken wings I have ever had. I should point out that the menu does have 4 pages to it and I distinctly remember seeing some nachos and burgers go by. The service, the atmosphere and the price come together in an orgy of student dining perfection.
Asterix Rating: ******* (out of seven)
- The Urban Kitchen - Conscientious and warm service-with-a-smile is the piece de resistance of the Urban Kitchen. The selection at the Urban Kitchen is quite impressive. The food is hit and miss but the other aspects are worth experiencing.
Asterix Rating: ***** (out of seven)


## Best and Worst of Campus Dining

Best Deal: Gino’s Pizza ([in Summer 1997,] \$2.34 slice and pop) Worst Deal: Food Services (pick your poison) Most Original Dining Concept: Mongolian Grill
Worst Atmosphere: Gino's Pizza (Hey, you get what you pay for)
Best Atmosphere: East Side Mario's
Strangest Lighting: William's Coffee Pub
Least Comfortable Chairs: Harvey's (no backs)
Worst Line-ups: Mel's Diner (Saturday, around noon)
Worst Sandwiches: Farah's Foods (yuck)
Best Burger: McGinnis (swiss and mushroom burger)
Best Late Night Snack: Pita Pit

Reprinted from articles by Jonathan Ezer

## The Frosh Dictionary

## Terms and Phrases you'll hear and need to understand

Arts: The faculty that's so easy to make fun of. Also the faculty that some mathies eventually end up in.
Bombshelter ("The Bomber"): The original campus pub and party place, a great alternative to Fed Hall, also open for lunch. However, you gotta be 19 to get in.
C\&D: The MathSoc Coffee and Donut shop, a food bonanza full of ice cream, caffeine and pastries at good prices. Located on the $3^{\text {rd }}$ floor of the MC, it's a great place to get lunch when you still have money (they don't take Watcards). Just follow the smell of coffee and bagels.
Campus Centre (CC): Old name of the Student Life Centre; anyone who still refers to it as such has been around too long. See Student Life Centre.
CIBC: Canadian Imperial Bank of Commerce, campus branch (in the SLC). Their machines are everywhere on campus.
Co-op Student: A gypsy with books.
Comfy Lounge: Big hangout place located on the $3^{\text {rd }}$ floor of the MC. Nice place to do homework, talk with friends and play cards. Has new venetian blinds but no big screen TV as of yet.
CSC: Computer Science Club, MC 3036/3037. Lively social atmosphere, large library, couches, members that can answer your questions about anything and powerful staplers.
Dana Porter: The Arts library. That big sugar cube at the centre of campus. According to legend, it's slowly sinking due to the weight of its books.
DavisWorld: Like the Eaton Centre with computers, DavisWorld is still in business as an adventure in colour, including twisty maze of tiny rooms, no two alike. And don't forget about the magic mushrooms popping up everywhere.

## Endless Loop: See Loop, Endless.

Feds: The Federation of Students, a campus-wide "organization" that aims (and sometimes misses) to represent the student body. Has useful services including businesses in the SLC.
Fed Hall: Big party place, has concerts from time to time. Open to all U(W) students.
Fed Hall Bouncers: Big like tree, smart like rock.
Guelph: The sound a dog makes as it tosses its cookies.
Imprint: U(W) student newspaper. Great for lining birdcages. Shipped in bulk on Fridays.
Loop, Endless: See Endless Loop.
Math: Your new Faculty, a great place for learning, meeting new friends and generally enjoying a productive and all-toobrief university career.
mathNEWS: You're reading it. Math's student newspaper, a bastion of humour, bad puns, a little math, and even less news. Run by student volunteers.
MathSoc: Located in MC 3038, the Math Society is the place to go for social information, photocopies, and copies of old midterms and final exams.
MC: Home. The Mathematics and Computer building, located at the north centre part of campus. It's big, grey and cubic. A block of ice in the summer, toasty warm in the winter.
Natural Log: The official MathSoc Mathscot, the symbol of our society, essentially a laminated log but we love it anyway.
Needless Hell: Also Needles Hall, a place (and a thing) all coops pass through.
Oxymoron: Any set of words with a self-contradictory mean-
ing. Classics include Postal Service, Good Morning, Civil Engineer, and Village Food.
Pink Tie: The other MathSoc Mathscot, also the symbol of our Faculty. Our visible symbol of pride (would you rather wear a twig?).
Recursion: See Recursion.
Red Room: Once the main computing room of MC, it closed down in the summer of 1999. Now in its place are a bunch of new labs and classrooms on the $1^{\text {st }}$ and $2^{\text {nd }}$ floors.
Rhursday: Day between Wednesday and Friday at U(W).
Right Angle Cafe: Few people use this term. See C\&D.
Ron Eydt Village (REV): Formerly Village Two, this is the other on-campus residence, believed to have mostly double rooms.
Security: Have flashlight, will travel.
Student Life Centre (SLC): Student building between MC and the PAC. Houses most of the Feds' businesses, the Bombshelter and the Turnkeys.
Village Food: Illustrates the difference between well cooked and cooked well. Food fit for a king (Here, King! Here, boy!).
Village One: The closer on-campus residence, laid out like a medium security pen, mostly single rooms.
Village Two: Or Village Zoo, this is what oldtimers call Ron Eydt Village. So see Ron Eydt Village.
Watcard: Your U(W) student card. Has all your information on it. Big brother is watching.
Watpubs: Mobile Bombshelters, pubs held in various Canadian cities once a week for co-op students on work term and U(W) alumni.
WLU:The high school down the road (Wilfrid Laurier University).

## Did You Know...

## Info from the UW 00-01 Undergrad Calendar

1. ... IMPRINT is dedicated to the intellectual analysis and coverage of news, arts, sports, and issues of the day.
2. ... mathNEWS is dedicated to entertaining and informing Math students but a lot of the time we eat pizza instead.
3. $\ldots$ the degree colour for a Bachelor of Mathematics (BMath) is wine.
4. ... you will be charged a Late Fee if your fees for Winter 2001 are not in by December 13, 2000. (Surprise!)
5 . $\ldots$ you may postdate your December $13^{\text {th }}$ fee cheque for the Winter 2001 term to January 3, 2001. (Don't try to understand.)
5. ... the Faculty of Mathematics has 15 miscellaneous policies, more than any other faculty. Actually, that's about 15 more.
6. ... professionally trained counsellors are available to help students with career decisions as well as personal and social concerns with no charge for counselling appointments.
7. ... the designation 'Dean's Honours List' is awarded to undergraduate Math students in an Honours program whose term average (TAV) is at least $87 \%$ in a complete term.
8. ... if you open the calendar exactly in the middle you can read all about your favourite faculty. No, not Science.

## Welcome to Math!

Math has lots of girls.
The Math Coffee and Doughnut is an expensive dining establishment.
You get to use the iMacs because the labs are never packed.
The sixth floor does not have a confusing floorplan.
You'll get used to getting up at 8:30 in the morning.
The girl who sits behind you in calculus thinks your slashdot t -shirt is charming and witty.
Lots of people are Stats majors.
The music in Waterloo is different at every bar.
This and many more lies to follow... But first, some things that are true.

1. You are provided with an email address at uwaterloo.ca. To find out what it is, you need to activate your undergrad UNIX account. If you don't know what UNIX is, you'll find out soon enough.
2. Duct taping your neighbour's door shut is a good idea. He will thank you for it and call you charming and witty.
3. If your first year profs SUCK, and I mean, put you to sleep before you even get to class, don't hesitate to switch classes. You don't even need to do it through the undergrad office,
just go to the other time slot. Find out when Serge D'Allesio is teaching his class, and then you can pass the course; even if he's teaching Psych 101, it'll probably help you with calculus. Other profs to follow around if you like to pass your courses are Troy Vasiga and J.P Pretti for Computer Science, Conrad Hewitt and Peter Crippin for Classical Algebra and Calculus.
4. Cafeteria trays make excellent winter time sleds.
5. The Bombshelter is the place to meet your friends outside of class every Wednesday. It's on campus and if you don't like the club atmosphere of Fed Thursdays so much, The Bomber's your locale of choice. Even if you don't drink, go for the atmosphere. Go for the fun of it. Go so everyone stops thinking you're downloading porn.

So indeed welcome to the Math faculty. Land of prosperity. Land of bagels. Land of the campus' best student "news"letter, mathNEWS. Yep, its true. As a member of this faculty you are entitled to read what I write. You too can write for mathNEWS. Entertain your friends! Write about nothing and get pizza every now and then, too. Best of all, you can see how many times you can get the word porn into an article.

KEV \& SPU

## Urban Myths Debunked

## Your Guide to the Truth

Even before coming to Waterloo, you may have heard strange rumours about university. Hopefully, we can clear any of those up now before things get too out of hand. Some myths are true, some are misconstrued facts, and some are out in out lies made up to scare students. With the help of Professor Simon L'Avier of UW's Folklore Department, mathNEWS provides you with the absolute truth on these stories.

Hook-man: Yes, there is a guy who wanders around campus with a hook for a hand, but Professor Ash does not terrorize young lovers sitting in cars, he teaches upper-year mechanical engineering classes (and he loves telling the story of how he lost his hand).

Philosophy exams consist of the question "Why?": This one did happen once at UW, but that was a few years ago and it was in a third year course. First-year professors have no interest in marking hundreds of essays at the end of the year, which is why everything, including the essay question, is multiple choice.

Students sometimes go missing from the popular nightclub FedHall: Although FedHall is a great venue for concerts and Boys and Girls Nights are well attended, I would hardly call FedHall popular. Oh, and for your safety, we recommend travelling there in groups, nobody should have to go to FedHall alone.

Dana Porter Library is sinking: Okay, this one is true. The foundation was only intended to support the building, and the books are too heavy. We lose about 2 inches every year.
The Math Building looks like a slide rule: Nobody has been able to confirm or deny this rumour, as people have no idea what slide rules are, or what they look like. It is believed they were an early type of calculator, but we've never seen one to verify this claim.

If your roommate dies, you get 'A's: Actually, you may lose marks because our incompetent campus police will automatically arrest you and keep you detained until they can find some one to determine the cause of death (This method caught a murderer once in 1976, so they've adopted it as standard procedure).
Marks are bell-curved to make $10 \%$ of the students fail: This is not the intent of belling marks, it is merely a biproduct of adjusting the average to something within $65-75 \%$. If a tenth of the class fails, that's just a bonus.
mathNEWS is filled with lies: That's a half truth. For it to be filled with lies, then even all the names of the writers would be fake, but at least half of those are true, although the content of some of their articles is entirely false.

Well, we hope this information has been useful in clearing up any misunderstandings you may have had about university life. Good luck in your first term!

Bradley T Smith

## Applicable Famous Quote

"There are three kinds of lies: lies, damned lies, and statistics." - Mark Twain

## Corollary to the Quote

The rumour that STAT 231 will be dropped as a course requirement for your degree is actually all of the above.

## The Prof Control Panel

Mark MM

The University of Waterloo will be installing the new Prof Control Panel in various desks and tables throughout the university on a trial basis in order to try to improve class attendances. Here is a brief excerpt from the operator's manual accompanying each panel.


- Prof Eject Button: For that boring part of the lecture when you just want to send the prof through the roof.
- Prof Nuke Button: Similar to the Eject Button but with a more dramatic mushroom cloud effect (usually takes out the first two rows of keeners as well). Radiation suit not included.
Prof Zapper: A quick charge of 500000 volts can easily tell a prof to get on with the lecture.
- Prof Volume: Allows you to sit in the front without shattering your eardrums, or to sit in the back and still hear the prof.
- Prof Rewind: Time warp back to an earlier point in the lecture.
- Prof Fast Forward: Comes in handy when the class is only halfway through and you're late for dinner.
- Prof Brightness Control: To reduce the effect of those fluorescent Friday ties.
- Prof Record: Lets you (re)view the lecture in the comfort of your own home. The Panel automatically selects a premium or cheapo tape, based on the quality of the lecture.
- Prof Stereo/Mono Switch: Changes professor's voice from a monotonic drone to a high-pitched whine with spurious glitches. If the prof is a 'Survivor' castoff, this switch has no effect.
- Prof Noise Reduction: Eliminates extraneous proofs, redundant lemmas and useless anecdotes.
- Prof Balance Control: Allows the student to adjust the lecture's theory vs. practice ratio.
- Prof Language Select: Choose one of Chinese, Czech, Farsi, Swahili, Esperanto, Basque or Pidgin English.
- Prof Font Select: Choose from a gallery of blackboard fonts: Greek, Hebrew, Zapf 'Dingbats', Wingdings, Bodoni, Old English or Cyrillic.
- Prof Gear Selector: Choose 'D' for normal lecturing, 'L' for low-gear grinding through DE's, 'R' for "if and only if" proofs, or ' N ' for catching your breath after an exhausting example.
- Prof Cruise Control: Set the most comfortable cruising speed for the lecture. We advise setting the speed below the legal limit of 50 (boards per lecture, that is). Failure to do so will void the warranty.
- Prof Motion Trac-ball with Plane Control ${ }^{\mathrm{TM}}$ : Move your prof around in 3 -space with an ergonomically designed Trackball and continuously variable oblique Plane Control ${ }^{\text {TM }}$. During rougher lectures, drive your prof up the wall; during better ones, help him reach that top blackboard in MC 2065.
- Directional Derivative Switch: Used in conjunction with Trac-ball and Plane Control ${ }^{T M}$ to send the prof off on a tangent.
- C\&D Control: Signal the C\&D to beam in the beverage or snack of your choice.

Georg, Vainamoinen and Jordankovic

## Highlights From The Past

## Random math related articles from previous mathNEWS

## Theorem of Just Desserts

Long, long ago in the dark ages of math, there lived a Greek mathematician by the name of Mythagoras. One day, while writing up his shopping list, he was suddenly struck by the marvelous idea of using a constant in logarithmic functions. Being Greek, he of course used English symbols to represent his functions, and since he was in the middle of choosing dessert for his next meal, he decided to call this constant "pie".
After some intense mental calculation, Mythagoras determined the value to use in a $\ln$ function. But he realized that to present this to "Greek Exponential Equation Key Services" he would need to shorten his notation: GEEKS preferred that constants did not exceed two letters. So he decided to go with the last letter, denoting his new number " $e$ ". That bothered him though, because he wanted to relate his discovery to the meal that had inspired it. Hence he determined that he'd need to do something with the other two letters before coming forward with his proposal. And after a dead end involving imaginary prime numbers, Mythagoras found that a circular argument produced another constant value. He quickly scribbled down a short notational reminder and ran out of his house, only to be hit by a runaway chariot.
Since Mythagoras was so great, he rarely bothered to write formulas on paper, and so all of his work was lost to us for generations and his name vanished into obscurity. Indeed, it was not until recently that mathematicians finally worked out the meaning behind his last great theorem: $\pi+e=$ lunch

Greg "hologrami" Taylor

## Pi in the Sky

There once was a number named $\pi$
It travelled all over the sky
It was transcendental,
So no continental,
Since air miles just did not apply

## mathNEWS' Top Ten Excuses for Late Assignments

10. I had to remove all the vulgarities.
11. I sold the publishing rights on it to Penguin Books and they haven't sent it back yet.
12. Oh, I thought you meant September $22^{\text {nd }}$ next year.
13. My horoscope said "Harm will befall you if you get everything done".
14. My friend wasn't done his assignment on time, and I had to clone it.
15. I was too sober to finish it.
16. I have to walk past Laurier on the way here and I was mugged by a bunch of football players.
17. The 'e' key on my computer was busted and I had to look in a thesaurus for synonyms.
18. 50 dollars? I thought you said 20 dollars!
19. I was reading mathNEWS!


Unfortunately for his final grade, half way through his linear algebra exam, Darren suffered an identily crisis.

## Haiku

to find data with maximum efficiency use binary search

## Hi.

I'm not your help desk or your tip calculator.
And I don't live in the comfy lounge.
I don't always drink Jolt, or really like iMacs.
And I don't know Brad, Kev or Van, but I'm sure they're really Chinese people.
I have mathNEWS, not a newspaper.
I code in C and C++, not Turing.
I pronounce it Vee-EYE not six.
I can proudly have e to 200 decimal places on my backpack.
I believe in induction, not proof by example.
Switching into Operations Research, not failing out of CS.
I believe the Pink Tie is of a proud and noble colour!
Pi is a constant, and Bacon is a mathematician!
It's pronounced Unix, not eunuchs! Unix!
MC is the second tallest building, the first Math faculty in North America, and the best part of the Epsilon distance around the Math building!
My name is Kevo! And I AM A MATHIE!

## Class Diversions

Well, the time may come when you find yourself sitting in class feeling bored and confused, with no idea of what the instructor is rambling on about. Fortunately, mathNEWS staffer $\operatorname{Kev}(0)$ has come up with some games you can play to amuse yourself on such occasions, which have been previously published in mathNEWS Volumes 81 and 83 . A few are being reprinted here. Of course, if you choose to partake in these diversions and therefore fail your courses or otherwise get into trouble, mathNEWS isn't liable.

1. Anagrams - Make the best anagram you can out of "I failed Math one-thirty-five".
2. Lecture Football - Essentially, you and your "Team" of people spread out among the class and compete against other Teams. Whenever ANY member of the class raises their hand to ask a question a "pass" is initiated. It is the goal of all teams to intercept the Prof by raising their hands in the proximity of the original question asker. ANYONE can start the pass (even those people not playing) and any team successfully intercepting gets one point. If the prof actually manages to pick out the correct person, the prof gets a point for completing the pass. Every interception and completed pass should be followed with excessive cheering and shouting. Think about starting up a league. (Thanks to MonkeyMan for this idea.)
3. "ELBOW" competition - This particular game is designed for Math 136, Math 235 and any other class incapable of retaining a $50 \%$ conscious class figure. So the steps to playing this game are as follows: i) Pick a suitable class where every other person is falling, or already is asleep. ii) Identify all sleeping people as targets. iii) The goal is to write
the word "ELBOW" on a target's forehead, or "FOREHEAD" on a target's elbow. A variation of this game is to compete amongst friends. Everyone should choose a different body part as their personal stamp of approval. The winner of the game is the person who is able to label the most targets with their stamp. Targets can be labelled once per stamp.
4. ARCTAN - This is an exam favourite and classic. For those not familiar with the rules, all somebody has to do to start the game is say 'Arctan' at a barely audible volume. Anybody interested in playing the game says 'Arctan' a little louder than the previous. Competition continues in this manner until you can't possibly scream it any louder or you get kicked out of wherever you are.
5. What Time is it Mr. Prof? - Another timeless classic. Best accomplished in longer lecture halls that have poor attendance, the goal is to make it to the front of the classroom without the prof noticing. Students begin by sitting at the back of the class, and when the prof begins to write notes on the board with his/her back to the class, students advance forward in the rows of chairs as far as they can before the prof turns around to explain what it is he/she is writing. To stay in the game, participants must be sitting down before the prof turns around. Students may gain a bonus row of advancement by at any time raising a hand to ask "What Time is it Mr. Prof?". Regardless of the Prof's answer to the question, the student may get up in full view of the professor and sit in the next row forward. The game is won when a student is sitting next to the Prof or taking notes on his/her desk.

Reprinted from articles by Kev

## Editor Rambling Space

Sort of a mastHEAD thing

Hello and welcome to the Mathematics Faculty of the University of Waterloo! Guess what, you're the first Frosh to get a Frosh Issue since 1996 (though there was a Frosh Primer in 1997). See, in 1997 the first Math Handbook was published. You should have one of those hanging about in your kit somewhere (assuming you got one). Read it! We used to publish a lot of that stuff in previous mathNEWS Frosh Issues. However, there is some stuff that book doesn't go into detail about, so that's why the Frosh Issue is back. Look elsewhere here for the article on "What is mathNEWS - Don't Panic!" Actually, there is an additional reason in that I , a mathNEWS editor for the Fall Term, want to help you all I can before I finally get out of here.
Perhaps it's a little presumptuous to say I'll be editing in the Fall (this sort of thing tends to be decided at our DisOrganizational Meeting), but seeing as I'm going into my 4C term (5A if you will) I think I have enough seniority to sneak in one final term behind the mathNEWS XTerm (as if I don't have enough other stuff on my plate). In case you're wondering, I'm still here because I'm trying to get a Music Minor to go along with my CS Major. Of course, when I actually showed up in Year One I planned on being a Pure Math Major. But when my 98 in OAC Calculus turned into a 70 in MATH 137, and then kept sneaking down into the 60 s in subsequent courses, I decided to look into other possibilities. So now I'm in Computer

Science; don't ask me how it happened, I'm still working that out myself. This brings me to my first piece of advice:
Try to keep your options open for as long as possible. You might think you know what you want, but that can change. With all the required courses your first few terms, hedging your bets isn't actually that difficult anyway. Secondly, make sure you have some aspirin on hand every Fall. When... I dunno what is it these days... 18,000 people some onto campus in diverse faculties from diverse geographical locations, at least one new virus manages to take hold here. Fortunately, it tends to be a 48 hour thing; you get over it and move on. If you're lucky, you catch it at the end of September. If you're unlucky you catch it in October, around midterm time. Lastly, well, I forget what comes lastly and I'm running out of space anyway. Sorry about that.

Now, were this a real mastHEAD, this article would conclude with a mastHEAD question and the names of all the people who worked on this issue. (Your name could be there if you come out to a Production Night!) However, since I just put this issue together in my spare time in August (I had a good deal of it), there are no names to print here. However, lotsa people submitted articles and their names are usually at the ends of them. So go read their articles now! Go! Oh, and Good Luck, plus thanks to Graphics Services for printing up the issue, etc...

Greg "Hologrami" Taylor

## Best of profQUOTES

Well, here it is, probably the most popular feature of mathNEWS... the profQUOTES. This is where you'll find funny, stupid or ambiguous things uttered by professors and recorded by students like you. If you think one of your professors has said something quotable, send it in (along with their name and the course), and if mathNEWS staff agree that it's funny, you may see it in the next issue! (Bear in mind that some funny things might lose their humour out of the context of the class.) It could be an incentive for you to stay awake at least.

Below are some of the better quotes as uttered in the last year, with a couple even older ones thrown in for good measure. (There's a number of others in that Math Handbook thing you got too. Guess where they got those from.)
"What we usually do is write this as $4=1 / 2$ so that the freshmen coming in next class will drop out."
K. Rowe
"I'm getting it! I'm getting it! Ha, ha. I've proved the wrong thing!"
Davis, MATH 234A
" $0 \times 0=0$, except on the STAT 230 midterm, where it could be any number of things, according to you guys."

Bennett, STAT 230
"There are four S's in 'STATISTICS': one, two, three... There are four S's in 'STATISTICS'."

Chen, STAT 230
"It's what professors do! Take something completely obvious, make it incomprehensible and call it a lecture!"

Mockay, STAT 231
"Just because I know nothing about it, doesn't mean I can't talk about it!"

Young, MATH 135
"We'll have to use calculus to do this proof, but that's okay because calculus is a subset of algebra."

Dickey, MATH 135
"You all should know that algebra is just a subset of calculus."

$$
\text { Lu, MATH } 237
$$

"I urge you to try and forget what you learned in high school." Willard, MATH 136
"Now I'm going to verify infinitely many of these and leave the rest for you."

Godsil, MATH 146
"Now we simply finish this equation with... (stares at board) Where'd that ' $y$ ' come from?"

Schellenberg, MATH 135
"The equation on that board should be the same as this one... but it's not, because I'm on drugs."

D'Alessio, MATH 137
"There are three series you should know or you'll fail the course: geometric; harmonic; and there's probably one more... I fail."

Hewitt, MATH 138
"How did I come up with this? ...Magic. I don't want to explain this."

Sednov, MATH 138
"This symbol means 'it does not exist'. If you cross it out, it still does not exist. If you cross it out twice, it exists even less."

Sednov, MATH 138
"Now we want to know his $v(t) \ldots$ Before he hits the ground. The rules change when he hits the ground."

Zorzitto, MATH 138
"Why do we use a parameter at all? (silence) Okay, so that will be question one on the final..."

Rehder, CS 130
"The problem with this array is... What the hell is that??"
Rehder, CS 130
"You guys have even fewer questions than CS130 this morning. And the problem is, I can answer questions in this class."

Shallit, CS 462
"The definition of professor is someone who talks in someone else's sleep."

Shallit, CS 462
"I can't say 'I am a baseball fish cat', although some days I feel like a baseball fish cat."

Vasiga, CS 241
"Well, you see it's more due to ethics. It wasn't you that did it, it was the caller... which is you. An earlier recursive version of yourself. Your evil twin."

Vasiga, CS 241
"If I were at Western in London, Ontario, I would now show you 29 examples. But we're not at Western... we're smart here."

Willard, PMATH 330
"Who thinks $20 \%$ ? No one? Usually somebody goes for that... you guys ARE smarter than the people at York."

Brecht, CS 354
"Let's start on unsatisfyability... this doesn't have anything to do with your sex life."

Hoffman, PMATH 330
"Are there any pure mathematicians in the crowd? I hope so ... I love irritating them. And they can't do anything about it." (puts infinity on his diagram)

Goodman, AM 373
"For example, I'll give you an even integer - say 7. (smacks himself in head) No! 10."

Irving, MATH 239
(after writing "colouring" on the board") "Minus 5 marks for anyone who forgets the ' $u$ ' in colouring. We're all Canadians here."

Irving, MATH 239
more profQUOTES on page 15...

## Yourmail@uwaterloo.ca

All right, listen up for some important information concerning email. Being an undergraduate in the Math Faculty of the University of Waterloo, you automatically get your own email account (as mentioned in an article elsewhere in this issue). You get to keep it for the entire time you're an undergrad and it will look something like: xlastnam@student.math.uwaterloo.ca, with a number in there if you didn't specify a middle name and you're not the first "Jane Smith" to ever join the faculty. There's also a very nice writeup in your Math Handbook about "Unix for Non-CS Mathies" (or mathies in general who are unfamiliar with Unix) that tells you about activating your account and logging on.
Some of you at this point might be thinking "Okay, so what? I've been using email since age 5 and have an account at hotmail along with twenty-six other places. Why bother with this new account?" This message is for you. Aside from the fact that activating your account is necessary for taking CS courses, the main problem you will encounter is that all people here who are not psychics will know nothing about your previous email accounts. Not a problem for any new friends you make, but maybe a point to ponder with group projects, and if you think your professor is going to keep track of 500 diverse yahoo accounts, think again. Your undergrad email is a First Contact Point around here. If you do not check your account for two weeks, you do so at your own risk.
"Fine," you reply. "So I'll telnet in and have a look-see every so often. But I hope you're not suggesting I start using this long rambling uwaterloo account instead of my trusty hotmail address!" Well, maybe not. But consider the following. You will, in all probability, find yourself working on the UNIX machines at some point. The PC labs are only available accountwise to students taking particular CS courses. Even if you're not a CS Major, Matlab and Maple are handy calculating devices. (Can you say "answer verifier"?) Admittedly, having your own PC might render those arguments moot, but hopefully we can agree that being able to check mail in the UNIX labs instead of lugging about a laptop $24 / 7$ is handy.
Now, it is true that booting up Netscape on a UNIX machine is a lot easier to do now than it was four years ago, when people in the labs would beat you within an inch of your life for consuming all the system resources. (Back in the good ol' days we used XMosaic.) But depending on the system load, running Netscape can still take time, and every so often pipes fracture, leaving you one sentence away from clicking send staring instead at your background with a cute error message in your XTerm window. Not only can you avoid this trouble using pine and elm, but MC3006 has Express Terminals that allow you to pop in, check mail, and pop out again during those times when CS assignments are due and there are no free terminals anywhere. (If you try to run Netscape on the Express Terminals, you will be beaten within an inch of your life.)
Of course, it's entirely possible that you've got your own account somewhere that doesn't involve running Netscape or IE and is a matter of a quick telnet, rendering the previous paragraph somewhat moot. In that case, consider a ".forward" file (either here or there), which is also incredibly handy for you co-ops. The alternative may be returning to campus after your co-op term and finding a message sent four months ago, the day after you left, saying that the disk upon which you submit-
ted your Final Project got corrupted, and that another copy is needed to give you a mark for this portion of the course (worth $15 \%$ ). A ".forward" file does what you think it does. Note also that you can telnet into the University from off campus, assuming no powerful firewall is in place your end. The point to all of this? You have been given an undergraduate email account. It is useful. Don't simply ignore it.

Greg Taylor Former CS Tutor

## ... profQUOTES continued from page 14.

"There'll be proofs, yes. It's graph theory, you know. It's not graph practice."

Haxell, C\&O 342
(cell phone goes off on prof's desk) "This isn't actually mine someone left it here." (picks up phone, hits "talk") "Hello... yes, it's in MC 2035... I'm actually teaching class right now."

Kearney, CS 360
"We're going to talk about nets; anyone in the class a fisherman? (dead silence) This morning in my 247 class I was talking about saddle points, so I asked if anyone had ever ridden a horse and no one would admit to it. Then I asked if anyone was a hiker because mountain passes look like saddles. Then I asked if anyone had ever been in a car driving through the mountains. Finally someone admitted to having been outside once."

Hare, PMATH 453
(prof walks into a half empty classroom) "It's getting better... Less people, more oxygen."

Zima, CS 450
Student: "Can you repeat the question?"
Prof: "That's a good way of ducking out of a question, especially with me, since I usually don't know what I asked."

Clarke, CS 452
Grad Student: "That's the kind of proof my first year students write."
Prof: "You wanna get up here and do better?"
Wagner, C\&O 430
"If you needed a pot you bought a pot, no one's pot was better than anyone else's pot... unless you smoked it."

Faber, CLAS 201
"Where am I going with this, you ask me. And I'm gonna try to figure that out in just a second."

Spielmacher, ENGL 208A
"You're junior co-op students; your employers don't have the time to fire you."

Smith, ECON 101
"Speaking of death, we do have this midterm next week..."
DeMarco, PHIL 120
"As you all know, when we graduate we get degrees with some latin phrase on them. Math's is 'in search of the truth' or something... or maybe that's the X-Files."

Vasiga, CS 241

## Red Room, Red Room

## Or the same thing backwards

Congratulations, Frosh 2000! You are the the first Frosh to arrive and witness the end product of the transformation of MC's beloved Red Room into a bunch of classrooms and labs. (Okay, so the rooms have actually been open a while, but they were still laying down the floor and stuff as late as last March and I don't know that people who arrive in the summer are really frosh.) Therefore, in an effort to keep alive some of the heritage behind the room which has housed some of UW's main computers since 1967, included in this Frosh Issue is a little historical babbling.
The Red Room came into existence surprisingly soon after the original MC building opened. Originally named MC2015, it was years before the room settled down to MC1015. The room was originally to be painted white in a neo-modern minimalistic style, until the painters remembered that they were still in the 60 's. The new IBM $360 / 75$ computer, originally a different shade of red, was then painted blue so that it wouldn't clash with the decor. Incidentally, this computer was the largest in Canada at the time; fortunately, at $70^{\prime} \times 55^{\prime} \times 20^{\prime}$, the Red Room could accommodate it. It probably had the largest cubic volume of any room on campus at the time: an incredible ( $70 \times 55 \times 20$ ) cubic feet.

There are many stories to tell about the Red Room, in fact, there are so many that they would fill a room as big as $70^{\prime} \times 55^{\prime} \times 19^{\prime}$. Too bad we don't have anything like that in the MC. Still, here are some of the tales, along with an extra one we made up ourselves. See if you can spot the forgery.

- Earth Shattering Experience. The Red Room was surrounded by windows to make it appear as a showcase, which it was. (Watching techs on display was a lot more interesting back in the 1970s.) But there were problems during the early years with the glass shattering. Perhaps it was because of vibrations from the equipment or perhaps it was heavy stones thrown by jealous people from other Universities, but either way, it made computer operators a bit nervous about the working environment.
- The Floor Show. Most of the cables and wiring for the Red Room ran under the red tile floor. Some creatures ran under there too, and every once in a while humans dropped in for a visit. Such as the time when the floor tiles were replaced incorrectly and a person who went in to investigate a computer problem feel right through the floor, receiving numerous scrapes and cuts. Have I mentioned comRed Room, Red Room continues on page 17...



## SO WHAT'S WITH ALL THE PICTURES?

(Bottom of page 16) Techs at Work: The Red Room back in May 1967. (Lower left) The Red Room in May 1999, shortly before the end. (Lower right) The IBM machines, mounted on the wall after being taken out of service. There is a rumour that they will eventually be remounted somewhere else. (On the right) New first floor lecture hall. Not shown are the new Mac/PC labs on the second floor. You'll see enough of labs once classes start.

...Red Room, Red Room from page 16. puter operators were a bit nervous about the working environment?

- Smoke Gets in Your Eyes. The black posts in the Red Room were a late addition. They were added to alter the way that air circulated through the room. Initially this wasn't much of a concern - as long as people had air, they were happy. But then one day the tape control unit caught fire and no fire alarms went off, because the smoke never made it to the smoke detectors. Computer operators no doubt demanded hazard pay by this point; they got the black posts instead.
- Letting Off Some Steam. System crashes also happened from time to time back in the old days. Once, when the popular IBM 360/75 went down, a bunch of IBM engineering experts had to be called in to diagnose and fix the problem. They accomplished this with the able assistance from an electric tea kettle. Why didn't the UW techs think of using that method? Probably because they were all coffee drinkers. One wonders what the bill looked like for that incident.
- Getting Punched Out. Punched cards were still in use during the early years, with decks for Red Room processing being submitted in trays. However, when someone came by one day to retrieve a very important listing, they discovered their entire deck had gone missing! Further investigation revealed that an employee had confused this critical job with a set of cards meant to be disposed of, resulting in a frantic search through numerous refuse bins. The employee likely ended up needing new employment, though with all the other stuff going on, maybe that's not a bad thing.
- There's a Switch. Tours used to be given in the Red Room, because despite those glass windows, there's nothing quite like a hands on experience. This point got driven home

rather forcibly when someone on a tour accidentally pressed the power off switch. It's not certain whether this incident occurred on the last tour given, but needless to say, some people had second thoughts about "tours" after that. I certainly never got a Red Room tour when I arrived at the University.
- Book 'em, AI. The Red Room is actually famous, as it was once featured in a real novel! Called "Adolescence of P1" by Thomas Ryan, the book was about a student who worked in the Red Room and wrote a program called P1. This program then took over, with the result that the student got fired. (Maybe there is such a thing as too much extra credit.) Set in the late 1960s, the book is currently out of print but you can likely find it in the library.
- Smile at the Birdie. The Red Room has also been featured in a movie. Called "Utilities", the motion picture starred Robert Hayes and featured some of the actual Computer Centre staff at the time. Regrettably, after this movie was released directly to video, it apparently did not receive rave reviews. Maybe if they'd repainted the Red Room blue for the scenes in which it appeared, the movie would have done better.

So there you have it. Then, Wednesday, June $23^{\text {rd }}, 1999$ at approximately $12: 05 \mathrm{pm}$, the switch was flipped to turn off the last piece of equipment in the Red Room. It's now up to you, young Frosh, to keep alive the stories of MC's former Big Red Room, seeing as it's been subdivided into lots of Little Red Rooms that aren't even red. Also included on the next couple pages for your perusal are more little historical parables you can gawk and stare at as you feel glad not to have been one of the students in CS back in the 1970s. Good luck to you in the coming millennium! (Oh yeah, and that fake story in the list above? It's the fifth one.)

By Holo with files from CAS and IST

The following is excerpted from the Computing Centre Newsletter, May 1977, out of an article on page 6 by Cory Burgener.

## Student Computing - A Brief History

This is an attempt to describe how student computing and the DEBUG Service evolved at the University of Waterloo. What was it like in the beginning, especially for the students?
As early as 1959, the university offered as its first computer course, a graduate course in Computer Science. At this time an IBM 610 was being used until the first computer, to be purchased by the university, arrived in late 1960. This was an IBM 1620, which [in 1977 was] still in evidence in MC 2037. At first, the 1620 had neither a card reader nor a printer. Card decks were read into a machine that coded the information on paper tape. The paper tape was then read into the 1620 and output results (solution or error messages) obtained on punched cards. The punched cards were processed on a 407. The 407 simply read in the cards and produced a listing on paper. By 1963, the 1620 was equipped with a card reader/punch, a disk file and an on-line printer. This computer was shared on a scheduled basis, the students being allotted two hours a day.
The next phase was the acquisition of an IBM 1710, a process control computer, and the rental of an IBM 7040/1401 in the fall of 1964. The atmosphere was more informal than the present one. Students and computer personnel were often one and the same and everyone was learning together. To run a FORTRAN program required that the programmer supply all the JCL (job control language). If others, who did not have a natural affinity for computers, were to use it, it had to be made more accessible. To accomplish this, the first WATFOR compiler was written for the 7040 by four third-year math students in the summer of 1965. [Their names were Gus German, Jim Mitchell, Richard Shirley and Bob Zarnke under the supervision of Peter Shantz. - mNEd] WATFOR was a fast in-core compiler with good error diagnostics. Students could now submit programs for debugging. What made WATFOR really useful to the inexperienced programmer was those error messages:

ERROR SV-0 IN LINE 2 (variable name).
Well, it was a beginning.
Things stayed at this enlightened level for two years. Meanwhile, plans were afoot to acquire an IBM 360/75. A new version of the WATFOR compiler had to be developed for use on this system. The quarters in the Physics building would no longer suffice. A multi-million dollar building was being built, and part of it would provide the Computing Centre with much needed space. Both the 360/75 and the new WATFOR compiler were ready when the Math and Computer building was completed in the fall of 1967.

There was some controversy about this building. Some felt it resembled a rabbit warren and that the architect had been on a Thursday night bender when he drew up the plans. Colour psychology was then in vogue and it was predicted that working in
the 'Red Room' would make the operators tense. And, if that wasn't enough, being on public view would turn them into dithering idiots. Happily, neither of these things happened. [Then, years later came the Davis Centre... - mNEd]

This was the era of the Rippers n' Wrappers (and the beginning of the I/O area). People were employed to rip output off the printers and, in the case of DEBUG Service, bundle them up and put them in alphabetic slots in the keypunch area upstairs.
The next major change to DEBUG altered that. In 1969, a One-step Monitor Interface was acquired. Corrections could be made and the job resubmitted without half a day's delay. At about the same time WATFOR was superceded by WATFIV. WATFIV was faster than WATFOR and included many new features. (One example is the facility to use CHARACTER variables.) And this time, for the inexperienced programmer, there were error messages in English. The error message:

ERROR SV-0 IN LINE 2 (variable name)
Now looked like this:
THE WRONG NUMBER OF SUBSCRIPTS WERE SPECIFIED FOR A VARIABLE (variable name) PROGRAM EXECUTING IN LINE 2 WHEN TERMINATION OCCURRED
As far as the DEBUG Service was concerned, growth had reached a plateau. The changes that took place in the next six years included additional processors (WATBOL, SPSS etc.) and the establishment of a DEBUG terminal room in Engineering.

During this time, however, there was a growing concern about costs. In the fall of 1975, the WIDJET system was introduced, then called the 'paperless system'. [mathNEWS 1983 identifies this as Waterloo's Inefficient Defective Job-Eating Terminals $m N E d]$ The 'keyboard and video-display screen' terminal replaced the card reader and printer. (WIDJET submits the job to the DEBUG Service and sends the 'printout' back to the terminal.) Besides being faster to debug a job and more fun, the WIDJET terminals cost one-third the price of a keypunch. This term [Summer 1977] will see the introduction of WIDJET terminals in Engineering.
What will be the next step? In the short space of twenty-five years, computer technology has advanced from vacuum tubes to integrated circuits, making possible micro processors and desk calculators. [It hasn't even been twenty-five years since this article was first printed. Look where we are now! - mNEd] It may not be many years before computers will be used primarily for storing unwieldy amounts of data. The future of large computers may seem uncertain. But, no matter how large the computer, there is always someone who has a problem that is too large to handle with a finite amount of computer resources.

CCN excerpts by Cory Burgener

## Useful URLs

UW Daily Bulletin: http://www.bulletin. uwaterloo.ca/
Math Faculty Homepage: http://www. math.uwaterloo.ca/Faculty/index.html
Orientation 2000 Homepage: http://www. math. uwaterloo.ca/Faculty/orientation2000.html
Your Personal UW Homepage (if you're Xavier Lastname): http: //www. undergrad.math. uwaterloo.ca/~xlastnam
mathNEWS Homepage: http://www.mathnews.uwaterloo.ca/
Things They Don't Tell Frosh: http://www.mathnews.uwaterloo.ca/Issues/mn6900/universe.html

## Introductory gridCOMMENTS

\author{

* gridWORD 101
}

Welcome Frosh, to a regular feature of mathNEWS! We call it the gridWORD. Sometimes it comes in a conventional/cryptic format, but more often than not these days we've been going for the standard crossword format. Now here's the good news: if you can solve the gridWORD and submit it to us (either through the BLACK BOX across from the comfy lounge, or email, or handing it to an editor in MC3041, whatever), you can win a prize! In the case of multiple correct solutions or other ties, there is generally a gridQUESTION asked each issue as well, and the most original response to said question helps determine the winner.
This issue, we are reprinting the gridWORD from Issue 3 of last term. This is because, owing to parody issues sucking up all our resources and other extraneous events, we never got around to printing the solutions for it. Ergo, you'll be able to find them in Issue 1 when it comes out this term. (Yes, this is obviously an attempt to suck you into trying the puzzle in that issue too, but what are you going to do about it?) No more solutions will be accepted for this special re-released gridWORD, considering the submission deadline was sometime back in July, but hopefully you'll find it fun anyway. The final paragraph below comes from the issue in which the grid first appeared (vol 83, i3) as written by Matt "So-Krates" Walsh, former editor and Gridmaster-in-Exile.
Anyhow, another week, another gridWORD. Only one Shakespeare reference this time, although a surprising number of Old Testament-related clues managed to sneak in. Purists will note that I went for rotational rather than reflection symmetry this time; the rest of you don't care. Good luck, everyone. Be seeing you...

The following is an excerpt from the Computing Centre Newsletter, May 1977; which was in turn an except from the same Newsletter, April 1967. Maybe it'll be excerpted again some day.

## U of $\mathbf{W}$ to Acquire Largest Computer in Canada

During the month of May, 1967 an IBM System 360 Model 75 will be installed in room P211 in the Mathematics and Physics Building. [It was moved into the newly constructed MC building in September of that year. - mNEd] The initial configuration will have the following general specifications: $1 / 2$ million characters of core memory, 4 medium capacity disk files, 4 magnetic tape drives ( 1 of these will be 7 channel), 11100 line per minute printer, 1 card reader-punch.
The internal speed of this machine is approximately 20 times that of the presently installed 7040 or 360 model 40 systems. It will rate with the fastest machines in Canada, and will probably be slightly faster than any other machine in this country.
The system will be run in "multiprogrammed mode". Thus several user programmes and the operating system will be resident in core at any given time. As a result all of the large memory will not be available for one user.
A smooth transition is expected and all pure FORTRAN jobs are expected to be run on the new system within days after it is operative.

## mathNEWSquiz

## So you think you're smart?

Hello and welcome to the Squiz section of mathNEWS. This is another of those regular features, in which you can test how much useless stuff you know through 4 or 5 categories of 4 or 5 questions each. It varies according to chosen SquizMaster. If you get the most correct answers out of everyone who submits, you win a prize (which is usually a voucher for the C\&D). Answers for a regular Squiz can be submitted by the date and time specified in the article through email or our BLACK BOX out on the 3rd floor.
The following is not a regular Squiz. Rather, it is a sampling of some of the most difficult questions as taken from various past Frosh Issues and other sources. You can submit answers to these if you really feel like it, but we won't give you anything for your troubles. Incidently, we do try to make these questions hard. Honest.

## Movie Quotes

## Name the movie

1. "Won't you please welcome, from Calumet City, Illinois, the show band of Joliet Jade and Elwood Blues-The Blues Brothers!"
2. "Another time, Highlander. I will find you."
3. "I've got just four words for you-White Men Can't Jump."
4. "If you've just joined us, this is Dr. Marcia Fieldstone, and we're here talking with Sleepless in Seattle."

## Funny Pages

## Name a character from each comic strip =

1. Garfield
2. Ziggy
3. Sally Forth
4. Calvin and Hobbes

## Sports

1. Upon what surface do ice skaters skate?
2. In basketball, how much do you get for a "three-pointer"?
3. How far apart are the yard lines on a football field?
4. What sport is a hockey stick used for?

## Song Lyrics

We give the artist and song, give us the lyrics

1. Trio - Da Da Da
2. Save Ferris - Come On Eileen
3. Don McLean - American Pie
4. Weird Al — Polka Your Eyes Out

## Potpourri

1. What is the shape of King Arthur's Round Table?
2. Who is the Lincoln Memorial named after?
3. Why do they call them "speed bumps" when they cause you to slow down?
4. Do you have a pulse?


## Across

1. Hun of note
2. Malignant spirits
3. Frenchman's wheat
4. Bread baked in 2 Down
5. Workshop
6. Verb suffix
7. Paddle
8. Challenging the underlying assumptions
9. In command of one's faculty?
10. Draw
11. Charged particle
12. Raw fish delicacy
13. Beer mug
14. A name for a thing
15. "Earl Grey, Hot", for example
16. The alternatives to tricks?
17. Collection of photos or songs
18. Spirit of the West song
19. Frightening
20. Bricklayer's tool
21. American spy org.
22. Honest pay for honest work
23. "Go $\qquad$ and multiply"
24. Razor-wielding monk
25. Dirt
26. Unix shell
27. Source of the Sun?
28. Natural
29. A long period of time
30. Hurt
31. It bites
32. "The Heart $\qquad$ Lonely Hunter"
33. Canadian mil. directors
34. Sprite (var.)
35. David's hymns of praise


> See page 19 for gridCOMMENTS

## Down

1. Folk singer DiFranco
2. Clay oven
3. The role of an artless young woman
4. They go with tigers and bears (oh my!)
5. Blues chanteuse Ball
6. Egyptian god of creation
7. Unix text tool
8. Something to flick?
9. Length of yarn
10. Measure of traffic, as on phone lines
11. Coat of arms
12. British elevator
13. What an actor engages in
14. "Once more __ the breach, my friends!"
15. Of the Sun
16. Long-legged, long-necked bird
17. California valley
18. Hebrew sacred writings
19. Cunning
20. Perform
21. Expel air
22. Lost vital bodily fluids
23. Mangy dog
24. Carouse
25. Supreme self-centredness
26. Be able to purchase
27. Tailbone
28. Dull pains
29. Bluish green
30. Justified by the end?
31. Two eighth-notes?
32. Stimpy's pal
33. One of Israel's sons
34. Playful bite
35. Original performers of "There She Goes"

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Verging on being a mathNEWS editor too long: Greg Taylor

