

Once again we must repeat the announcement that it is now *the end of next week*, and remind any of you club-members who haven't yet picked up your membership cards to poke your nose in the CSC office sometime, and do so.

In addition to this, there will be a meeting next Thursday (November 18, 1976). More on this later.

### Club meets once

The CSC held a sort of surprise meeting on Thursday, November 4. There had been only the one day to put up notices and stuff as no one had known until that morning whether it was going to be held or not, but it was.

Steve Johnson from that weird and wonderful place known as *Bell Telephone*

*Laboratories* gave an informal sort of lecture dealing with Compilers. Bell Telephone Laboratories—usually known as "Bell Labs"—is the original source of much of the neat stuff in computing here, such as B, C, L<sup>0</sup>, SNOBOL, the text editor QED, the YACC compiler-compiler (by Steve Johnson), UNIX, and wmgentleman. Mr. Johnson, who is an adjunct professor here, had come to talk to some other people here about portability in computer languages, and the CSC was very fortunate that he agreed to talk to them as well.

Because of the short notice, as well as the perhaps rather fearsome billing of the meeting, as a "talk on Compilers", a large proportion of those in attendance weren't official club members, but "hacks" out for a little (of their kind of) small talk (in addition to free donuts). Perhaps it was due to the early 7:30 p.m. start time that the attendance increased monotonically during the evening from about 20 to almost 40 by the time the donuts arrived.

However, except for the occasional unexplained acronym, Mr. Johnson managed to keep his talk on a fairly

elementary level, so that anyone who had at least some experience with programming could have understood it. Besides talking about compilers, he also explained what sort of a place Bell Labs is like, and gave a short history of their work, and suggested a few ideas dealing with the philosophy of programming.

After the talk proper, there was a question-and-answer period, and, of course, the free donuts. Many of the people also stayed to have an informal chat with Mr. Johnson.

### and will meet again!

Next week's meeting, to be held in MC 5158 at 7:30, will feature a talk by Professor J. W. Graham about *The History of Computers*, particularly here at Waterloo, as well as a discussion by Tom Miller (trmiller), a grad student, about the HUB Computer Communications Project here at Waterloo. There will be another meeting in December.

You should have noticed the posters by now anyway.

FRIDAY, NOVEMBER 12, 1976  
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# math NEWS

## Day-Care Grants Cut

On September 15 of this year, the Health and Social Services Committee of the Regional Municipality of Waterloo reversed 25 years of progress in civil rights: they have passed a law which involves explicit discrimination against a section of society without regard to means or need. The section of society concerned here is that of "student", and the law is

*That no day care subsidy be made available to children of students in graduate university programs.*

An amendment to deny day care subsidy to all students, undergraduate as well as graduate, was defeated. Day care, by the way, refers to government grants to needy families in which the parents must leave the children at a day care center while they go out to work or school. Particularly important among this class of families are those in which the parent is single or separated.

The law above applies only to graduate students, but in fact the committee also discriminates against undergraduates in co-op programs. They do this by classifying a co-op student as a "student" during the school term, and as a

"worker" during the work term. The constant re-classification, combined with the size of the waiting lists and the committee's perverted priorities, effectively prevents a co-op student from getting a grant. The action of the Health and Social Services Committee was prompted by the Provincial Government's policy of restraint; a limit has been set on the increases of regional day care budgets, and the Committee has been forced to implement a cutback. However, the nature of the cutback is without regard to need; few would deny that students are in one of the lowest income groups in the country.

The Graduate Club and the Federation of Students want to fight this blatant discrimination; graduate and co-op students make visible contributions to the economy and to society, the former from research and teaching and the latter from work terms. The government fosters the impression that all students are parasites of society, and then justifies its actions by referring to "public opinion". We must stop the government now, before they become more confident and enact further sanctions against students.

There is an election coming up in December, and students should make their opinions on discrimination known to the candidates. Who are the engineers of

the present discrimination? The law was proposed by Councillor G. Stoner and seconded by Regional Chairman J. A. Young. The defeated amendment was proposed by J. Sutherland (who argues from the point of view of "morality", and admits that he has Victorian attitudes in this area) and seconded by C. Roth. Sutherland and Roth were the only Councillors to vote for the amendment, but all of the Councillors present voted in favor of the main motion. The other Councillors were T. Fairless, B. Turnbull, and Kitchener Mayor E. MacIntosh.

The Graduate Club and the Federation of Students also wish to apply pressure directly to the committee. We need statistics (which the government consistently refuses to provide) relating to the number and the situation of students who are single parents, or parents in need, and are unable to obtain a day care grant. If you are such a person, or know someone who is, please contact me via the Graduate Club (extension 3803). (All replies will be in strictest confidence.) We need information and support to win the fight against discrimination.

Nick Redding

## PM NEWS!

Professor B. Forte of UW's Pure Mathematics Department will speak on *Topics in Ergodic Theory* at 3:30 p.m. Monday, November 15, in MC 5097.

Miss C. T. Chen, a graduate student also in Pure Mathematics, will speak on *Circle Geometry* at 11:30 a.m. in MC 5158.

## Kiddie Korner

Hi Kids!

Before we begin, we have been noticing that our style is being emulated by other journalists on campus. In fact you might say they are treading on our territory.

Last Wednesday, the Gazette ran a glorified doodle. They printed an obscure picture and asked people to identify the object in the photo. To add insult to injury, they had the gall to say they would print the name of the first person who guessed right. That's hitting pretty close to home, and we hope our faithful readers refused to participate in the contest.

Burloaf was a little more subtle in his approach. Last week he offered a SEQUENCE OF THE WEEK. Even though he used numbers instead of letters and didn't request any solutions, he can't slip anything past us. All we can say to both Burloaf and Gazette is "Back off Jack!"

Since we know you are all waiting in suspense for the solutions to last week's problems, here they are.

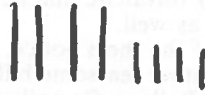
First the progressions. The only person to send in a correct answer for the hard one was kwstreet who submitted VERWTQ (capital cities of Canada from west to east). However, he got the easy one wrong. His solution was MVEMJU, but it should have been MVEMJSUNP for the planets in our solar system. We guess he should be sent back to public school for a refresher course! Owen Leibman and cmdurance were able to pass the test and solve the easy one, but didn't attempt the hard one.

While we're on the subject of progressions, here are the ones for this week. What follows DRMFS? And what comes after AEFHI? (Hint: This is a straight-forward progression. Stick with it and you'll get it.)

Our puzzling puzzle got some response. Owen Leibman gave the classical solution to the six-penny problem. Merely lay five pennies down to

form a cross and place the sixth penny on top of the middle penny. Voilà! Two perpendicular rows with four pennies in each. Someone named "M.P." also sent in this solution and we would like to know who this is. A much more elegant solution was submitted by Donna Strangway who said we should place one penny on each of the poles of a sphere and the remaining pennies equidistant around the equator to produce three perpendicular rings each containing four pennies. Incredible!

This week's puzzle goes like this. You are given the following sticks.



Now without discarding, adding or breaking any pieces, you must construct exactly three equal-sized squares. You are not allowed any open edges. We will print the answer next week. (This can be done in 2-space, unlike the penny problem.)

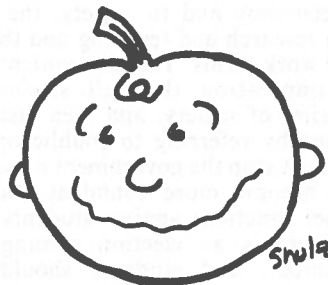
About last week's maze. Ken Andruchow said it "sucked". But dwwbrown was a little more TAKtful. He said, "To get from the start to the finish, all you have to do is go around that little square with all the lines inside it." End of problem. Now don't you feel silly?

The solutions for last week's doodles were:

- [1] BEAR CLIMBING FAR SIDE OF TREE
- [2] FAT LADY WASHING FLOOR

It seems that the cryptograms helped since submitted solutions were correct word for word. Congratulations to Lisa Seiler, Rob MacDonald and The Mad Chuckler who were the only ones to submit both solutions. Chris Uttley got the first one, but then tried to tell us that the second was a butterfly coming in for a landing on the Royal York Igloo in Dawson City. Close, but no cigar!

For the finale, here are our Jack'o'Lanterns..



...continued on page 6

## FEDERATION

I held my first *Meet J. J. Long* session of the term this week. I could not use the Math Lounge because of my inability to procure a sound system, so the session was simply held near the Mathsoc office and the five or ten people who came had met me before. While a "free chevron" reporter tried to change the session into an interview about the chevron, we were able to discuss other problems. Of the people I talked to, I got the impression that they feel that there should be an outside investigation of the chevron affair. I could dwell more on the topic and tell you how Roberts, Docherty, the Federation, the free chevron, and the AIA have mishandled and screwed this situation, but I rather feel that you are getting bored of all this. Many agree that both sides are wrong and I have made my feelings clear on this issue.

On a lighter note, this week's hack-of-the-week is Dave J. Buckingham. The former Science student has taken a recent interest in photography, with a common subject being Walter Banks of CCNG. Though he is the originator of the Burloaf name, he is not the person who has popularized it.

I haven't mentioned Math-Arts-Science-ESS Week in a while. The publicity for the week refers to it as pandemonium. The activity begins Sunday so check the posters for details.

It seems that Shane Roberts has taken a lesson from the book of the AIA and the free chevron by his action of holding secret executive meetings when they were not announced as such. At the meeting Mike Dillon of *mathNEWS* was denied a post on the Federation executive, perhaps being a victim of reverse sex discrimination.

At the forum on the future of the university on Tuesday, Doug Wahlstein said that the university would solve its problems if it stopped paying interest on the mortgage on its residences. In case of foreclosure he recommended a sit-in at the residences. He said that the people of Ontario paid for these residences, but apparently did not feel that they should get a return on their investment.

In regards to the Kalbfleisch article in *mathNEWS* last week (which was mentioned by Dean Forbes at the forum): I found it interesting that when we left the forum for a reception in the Math Faculty lounge we found on our arrival there a student asleep in a chair, no doubt tired after doing a great deal of schoolwork.

Due to the fact that there is no Burloaf this week, in this space normally reserved for Burloaf, this week we will not present

# BURLOAF

...continued on page 6

## Crib Victory

The cribbage tournament held last Thursday by the Campus Centre Board was a victory for Mathies. Both champion and consolation prizes were given to math students, the champion being undefeated and the runner-up suffering only one loss. Rob was the champ, with Roman finishing second—unfortunately our correspondent didn't get their last names.

## Shakespeare & Kenton

The UW Drama Group is presenting *A Midsummer Night's Dream* by William Shakespeare, in the Theatre of the Arts from November 16 to 20. UW's Tom Bentley-Fisher directs; Pat Bentley-Fisher of the Stratford Festival plays Titania/Hippolyta. UW's William Chadwick and Maurice Evans appear as Oberon/Theseus and Bottom respectively.

Students/seniors admission \$1.50, others \$2.50; 50¢ higher for the last two shows. Special student matinee on November 18. Available at main box office, ML 254.

On November 18 at 8 p.m., innovative jazz musician Stan Kenton will bring his big band to the Humanities Theatre. This is his only appearance in Ontario during his current trip from Michigan to Montréal.

He must be good, they're charging \$6.00 (students/seniors \$3.50). Tickets at ML 254.

## A Hackland Soap Opera

*Scene:* An expensive restaurant in downtown Waterloo.

*Characters:*

**Ciaran** — a well-known hack.

**Debbie** — a not\_so\_well\_known non-hack

### ACT I, SCENE I

**Ciaran:** (*apprehensively*) Debbie, I have something important to ask you.

**Debbie:** Yes.....

**Ciaran:** Will you....

**Debbie:** (*eagerly*) Yes.....

**Ciaran:** Will you be my password?

*Curtain*

*The End*



## PANDEMONIUM WEEK!

This week is being sponsored by the Math, Arts, Science, and Environmental Studies societies—M/E/S/A. Here is the latest version of the schedule:

### Sunday, November 14

Coffee House with Bill Hughes. *Free admission. 8-12 p.m. in CC pub area.*

### Monday, November 15

Film night—"The Pink Panther" with Peter Sellers, David Niven, and Claudia Cardinale. *M/E/S/A members free, others \$2.00. 8 p.m. in AL 116.*

### Tuesday, November 16

Bridge Night. *7 p.m., MC third-floor lounge.*

### Wednesday, November 17

Math Slide-Rule Competition and Society Challenge. *12:30 p.m., MC third-floor lounge.*

Roller Skating. *Free buses will leave from in front of the CC at 7:30, and the roller skating will start at Bingeman Park at 8 p.m. \$1.25/person.*

### Thursday, November 18

Arts Spelling Bee. *Noon, HH Foyer. Sign up now in MC 3038.*

Mathsoc/JJBT Table Hockey Tournament. *75¢ non-refundable entry fee. All day, MC third-floor lounge. Sign up now in MC 3038.*

Card night. *8 p.m. at the Grad Club.*

### Friday, November 19

Broomball Tournament. *St. Clements Arena, 9 a.m. to 5 p.m.*

Mathsoc/JJBT Table Hockey Tournament. *75¢ non-refundable entry fee. All day, MC third-floor lounge.*

Wine & Cheese Parties. *8:30-12 p.m. in MC 5136 and HH 373/378. M/E/S/A \$1.00, others \$2.00.*

### Saturday, November 20

Mathsoc/JJBT Table Hockey Finals. *9 a.m. to 4 p.m. in CC Great Hall.*

"Society Social" semi-formal with "Chelsea Morning". *At Valhalla Inn, Kitchener. Bar opens 6:30 p.m.; dinner at 7:30. M/E/S/A \$14.00/couple, others \$16.00/couple. Groups of more than two couples must make reservations at MC 3038.*

## AM NEWS!

## Dog Shoots Man

LUNEVILLE, France (Reuter)—A man walking in the street here was shot in the shoulder by a dog firing from a hotel window, police said today\*.

The dog had grabbed his master's hunting rifle and when he put it down on a chair by the window it went off.

The passerby was only slightly wounded, police said.

*K-W Record,*  
\*November 8, 1976

## To Second-Year Mathies

If you are not yet aware, the preliminary exam timetable is posted in Needles Hall and various other places such as outside the third-floor lounge. Before you run over and check what catastrophes you have, there is one point which may be of interest. If you take CS 150, Math 220A, and Math 221, you will find that the former two occur on December 23 at 7 p.m. and 9 a.m. respectively, while the latter is on December 22 at 2 p.m.

Not being a sadist or masochist, this particular arrangement does not appeal to me. Should you share similar views, please see Ken Lynch in the Mathsoc office, or just sign your names to the referendum in the Education director's mailbox there. If you want it changed, you have to do it.

Ken Lynch

## Blood Donor Clinic

The Red Cross Blood Donor Clinic will once again take place in the lounge, MC 3002, this month. The dates are Wednesday and Thursday, November 24 and 25.

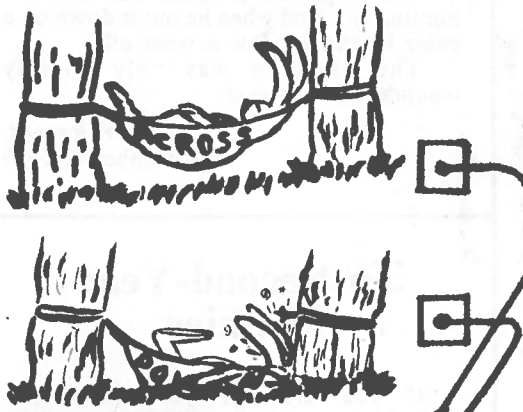
You can donate between 10 a.m. and noon, or between 1:30 p.m. and 4 p.m.; the Red Cross advises you eat breakfast or lunch (respectively) beforehand, lest you possibly feel faint afterwards.

They'd like to have a thousand donors. It has become customary at these clinics to record how many from each faculty donate, and in the past the highest percentage turnout has usually been from Math (although HKLS have slipped in a few times). Let us extend our victory record in the blood bowl—get out on November 24 or 25 and bleed for Math!

# GRIDWORD

NAME (SYNONYM)  
NUMBER (BESIDE)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	X							X							X
2		X						X							X
3			X					X							X
4				X				X							X
5					X			X							X
6						X		X							X
7							X	X							X
8	X							X						X	X
9								X						X	X
10					X			X						X	X
11						X		X						X	X
12							X	X						X	X
13								X						X	X
14	X							X						X	X
15	X							X						X	X



- A2 A B option
- A3 ||
- A4 Math department
- A5 Brand of Warren Beatty film
- A6 Oil people
- A7 Condensing form
- A9 Unparalleled
- A10 Congenital mole
- A11 What henes do?
- A12 Might be Réinaldo's new language
- A13 Quiet
- A14 French plural
- B11 A Sumer type comment
- B15 Service coat of U. S. Army uniform
- C2 Per helios
- C14 Not (I) will
- D3 National Socialist German Worker's Party
- D8 Beatle song
- D13 Volcanic scoria
- E4 State of one who is sitting
- E12 12% overdrawn
- F5 Stakes
- F11 BOOM
- G6 Ostrich cousin
- G10 Needed for word
- I1 See B1
- I2 Auf wiedersehen
- I3 Feline
- I13 Short winged marsh bird
- I14 Husky job (2 words)
- I14 As sheep (2 words)
- I15 Before C14
- J7 This probably full of them
- J9 What you are becoming
- K6 Johann was, 76/10/08
- K10 Pertaining to nerves
- L5 After E12
- L11 Fermented honey & water
- M4 8
- M12 Compass point
- N3 87.62 amu
- N13 &print Easy
- O2 Drink
- O14 Indefinite

- 1B Previous release, if the "Dean of Math" hasn't succeeded
- 1C Faculty
- 1D Left out of Gridword XII/5
- 1E Hearst abductors
- 1F Becomez lezz hard
- 1G Malheureuse
- I1 Surf area (California)
- 1J Au Revoir
- 1K Hill in Jerusalem
- 1L M4 + 2
- 1M Entropy unit
- 1N Is 2nd person
- 2A ""
- 2O Tire tracks
- 3B Comet discovery (sort of)
- 3N Drive cattle to market
- 4C Fat Norwegian saint
- 4H Another Beatle song
- 4M Female bass singer
- 5D Indirect/Non straight forward clue
- 5L Daily \$
- 6E MIX + LIV = MLXIII
- 6K CCl<sub>2</sub>F<sub>2</sub>
- 7F Too much Energy
- 7J What you probably do (right now)
- 9A Suppose that
- 9B Under
- 9C *Hedera helix* strains.
- 9M VD
- 9N Probably done this a lot
- 9O 1L + 2
- 10G What this gridword does to you
- 10I Pope's race
- 11F Sometimes trained
- 11J D  
O  
W  
N
- 12E Prussian blue
- 12K Grainhouse
- 13D Affirmative slave reply
- 13L Rumanian money
- 14C State of chevron
- 14M Deciliter
- 15B Producer of L11 ingredient.
- 15N Co-enzyme

## Gridcomment

The solution to last week's *Gridword* is:

INSTEAD OF TRYING TO PRODUCE A PROGRAM TO SIMULATE THE ADULT MIND, WHY NOT RATHER TRY TO PRODUCE ONE WHICH SIMULATES THE CHILD'S? IF THIS WERE THEN SUBJECTED TO AN APPROPRIATE COURSE OF EDUCATION, ONE WOULD OBTAIN THE ADULT BRAIN. PRESUMABLY THE CHILD-BRAIN IS SOMETHING LIKE A NOTEBOOK AS ONE BUYS IT FROM THE STATIONERS.

A. M. Turing,  
"Can a Machine Think?"

(An article we found in *The World of Mathematics* [James Newman].)

There were 16 submissions, of which 1 had **WHO NOW** instead of **WHY NOT** (with the corresponding errors below), 2 had **NOTEBOOK IS**. **ONE** instead of **NOTEBOOK AS ONE** (one without the corresponding error below although it corresponds to a common misspelling; the other didn't hand in the bottom part, which is okay.) and the other 13 were correct.

We flipped four dimes and the winner is

Dave Newell

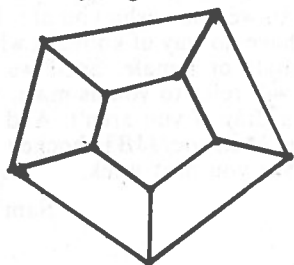
This week's gridword is by **Johann George** and **Dave Buckingham** again, but ought to be a *bit* easier than their first one.



# How the Four-Color Theorem was Proved

The four-color problem is the problem of determining whether four colors are sufficient to color any map\* drawn on a planet† so that no adjacent‡ regions have the same color.

It is easy to construct a map with four regions each of which is adjacent to all the others, and to prove that this is impossible in a map with five regions. While the former result proves that four colors are necessary, the latter does not prove that they are sufficient. The map below does not contain four regions each of which is adjacent to the other three, but nevertheless requires four colors; an analogous map might exist for five colors.



The problem was first proposed by a math student named Francis Guthrie in 1852. The mathematician Arthur Cayley put it to the London Mathematical Society in 1878, and the following year a member named A. B. Kempe attempted a proof.

His method was to show that there could be no *smallest* map requiring five colors—no *minimal five-chromatic map*. This obviously implies the theorem.

Suppose region  $X$  in a minimal five-chromatic map has neighbors  $A$ ,  $B$ , and  $C$ . Erase the boundary between  $X$  and  $C$ . The resulting map is smaller than the minimal five-chromatic map, and hence is four-colorable. So four-color it. Then reinsert the boundary line. But now  $X$  can be colored with whichever of the four colors was not used for  $A$ ,  $B$ , or  $C$ . This argument shows that no region  $X$  in a minimal five-chromatic map can have exactly three (or, similarly, less than three) neighbors.

A configuration which, if found in a map requiring five colors, implies that there is a smaller such map—and which, therefore, cannot appear in any minimal five-chromatic map—is called *reducible*. Thus a region with three or less neighbors is a reducible configuration.

A region  $X$  with exactly four neighbors  $A$ ,  $B$ ,  $C$ , and  $D$  (in order) is also a reducible configuration. The same proof applies with one addition. After the smaller map is four-colored, regions  $A$ ,  $B$ ,  $C$ , and  $D$  might require all four colors, leaving none for  $X$  after its re-creation.

But any path of regions from  $A$  to  $C$  excluding  $X$  must intersect any similar path from  $B$  to  $D$ . Kempe proved that this implies that a group of regions in the four-colorable map can *always* be recolored so that one of  $A$ ,  $B$ ,  $C$ , and  $D$  gets the color of the opposite one; and the former color can then be used for  $X$ .

Thus every region in the minimal five-chromatic map must have at least five neighbors. But, as Kempe showed, every map contains a region with five or fewer neighbors. He thought he had also proved that a region with five neighbors was a reducible configuration, which would have established the theorem, but in 1890 P. J. Heawood pointed out an error in this proof.

In the years since 1913, many mathematicians—G. D. Birkhoff was the first—have proved many more complicated configurations to be reducible. But nobody had any reasonable intuition of a set of configurations that was *unavoidable* (meaning that every planar map would have to contain at least one of its members) and all of whose members might be proved reducible.

Enter the computer.

Heinrich Heesch and his students formalized Kempe's ideas and used computers to show a great many configurations reducible. He developed a method to find an unavoidable set of configurations for maps with certain restrictions.

In the late 1960's, Wolfgang Haken of the University of Illinois improved Heesch's methods, then decided that more

time should be spent on finding unavoidable sets of configurations. In 1972 he was joined by Kenneth Appel.

They developed a program that tested different variations of Heesch's procedure. It was very complex and took a couple of years to perfect, but once it was running the team became convinced that they could find an unavoidable set consisting of a few thousand configurations, each likely to be reducible.

But of course *every* configuration in the set must be reducible. At this point John Koch joined the team, and helped produce the following technique.

A configuration is generated for the potential unavoidable set. It is tested for reducibility. If it has not been proved reducible after ½ hour on an IBM 370 model 168, then the program backtracks, modifying the configuration-generating procedure so that this configuration does not occur again. If the generating procedure ever gets to the end of the unavoidable set, each member will have been proved reducible, and the theorem established.

The attempt was made in June 1976. 10000 configurations were created, over 2000 were tested for reducibility, and after 1000 hours on various computers, the program terminated with under 2000 members in the unavoidable set of reducible configurations.

The four-color problem was solved. □

Condensed from  
*The New Scientist*,  
October 21, 1976.

**mathNEWS** will print your ads **free of charge**. Just jot them down on a piece of paper and put it in our *mailbox* on the third floor across from the C&D lounge, or take it to Mathsoc and have them put it in our mail slot, or put it in the mail addressed to **mathNEWS**, MC 3038, or send them in the mail subsystem on TSS to userid **mathNEWS**.

**Bryce Jordan!** Please report to Mathsoc, MC 3038, to confirm your reservations!

**For Sale:** 100% organic karma—1 lb (450 g) package, \$1.44; 2 lbs (900 g), \$2.56; new economy 5 lbs (2.25 kg) box, \$5.49. Supply limited so order now. Send cash or yeti teeth (no shark teeth, please) to: Sri Maraschino Maharishi, high atop the snow-covered peaks of the Arts Library.

**Reward:** Lost, one snowman, abominable. Last seen heading in direction of Village 1, accompanied by family of small ducks. Phone 884-6298 for further details. Reward offered due to sentimental value of snowman.

**Wanted:** 11 other "nice" guys to meet 11 virile male students on the Optometry path. Meet Monday, November 8, to form a convoy by Optometry building. Percival III.

**Lonely** retired cause seeks adherent as companion. Preferably not a fanatic but fervent blind believers welcomed. Should not desert in time of crisis. Ability to argue illogically without knowing considered an asset. *No apathetics need apply*. Contact pckelly via TSS mail.

**Notice:** Due to lack of space caused by the tremendous interest shown, the upcoming meeting of 1st-year algebra students to discuss Professor Lastman's writing hand, originally scheduled in MC 2065, has been moved to the Engineering Lecture Hall. Fred Fourreur.

**You** have not coughed up the \$10,000. I have decided to raise the ransom to \$11,000. Pay soon or you will never see your daughter again. Send money to dpbrown on TSS.

\*a partitioning of the planet into regions by curvilinear boundaries.

†for surface of a sphere.

‡sharing a boundary consisting of more than a finite number of points.

This week we discuss quirks is some IBM generating systems, and computer jargon.

After the last two weeks' hiatus, we return with a small bit of invective against IBM.

One of the worst pieces of software inflicted on the IBM user community was TSO. It was originally designed in 1964 to run on /360's and was propagated through many releases of OS/MVT and OS/VS2 release 1.7. This timesharing system remained substantially unchanged through to this release.

The design was similar to GCOS TSS. The time-sharing executive ran as a program separate from the operating system, and had a number of user regions for execution of user programs. The user program was swapped in and out of the region in which he was executing. (Where the author works, we ran 3 user regions under release 1.7 of OS/VS2.) The executive invoked the user after logging in by reading in his login procedure through an OS reader/interpreter (i.e. the login procedure was JCL.) The EXEC card in the login procedure invoked the user's TMP (Terminal Monitor Program), which acts as the "shell".

Many problems occur in standard TSO since there is little or no data security on the IBM system, and many TSO commands exist for passwording, deleting, reading, and writing datasets (= files). At our installation, we installed PCF (Program Control Facility), which restricts the class of commands the user can execute. PCF hooks into the DAIR (Dynamic Allocation Interface Routine) SVCs (Supervisor Calls = MMEs/-DRLs) to restrict access to datasets.

This gives some degree of protection. It was fine as long as the user couldn't execute a program under the time-sharing TMP, since the program could then execute privileged SVCs, such as DAIR SVCs. If one had permission to use the test command (= lodt on TSS) then one had access to the TMP's region, since the TMP dispatches test by a "Link" rather than an "Attach" as is used for other commands (and which would afford the TMP protection of its region). This makes the system extremely vulnerable to attack, since the TMP is effectively part of the TSO executive.

TSO's interface to getting I/O from batch jobs is with OS spooling, and is independent of HASP. The TSO users have a background HASP reader, but have no facility for finding jobs in queues, deleting jobs in HASP queues, and so forth, unless they are written at the installation.

The major problem with TSO, apart from poor security, was its poor performance. At our (where the author works)

installation, we had 15 users running on a /370 model 158 (2½ times as fast as the 6060) and we crawled. Some students I know, who have IBM systems programming experience, claim that this is a result of poor timing of our system. This may be true, but how much time must be spent timing? Standalone system testing time is not cheap.

We have other things to write about IBM perpetrations on users, but we're saving them for subsequent articles.

Note: Under OS/VS2 release 2 and subsequent releases, TSO is an integral part of the operating system. JES2 also knows about the time-sharing users, whereas HASP did not.

Jargon is a major problem in the computer field. The author has heard many people in the "real" world complaining about the lack of communication with computer people. Numerous applications in everyday life now present themselves for computerization. As long as we computer people continue to isolate ourselves behind jargon, we risk the fear and loathing of the general population.

Already many people feel they are victimized by computers. While talking with your non-computer-oriented acquaintances, how often do you find computers being attacked? When you attempt to explain what you do, how you do it, what you're using to do it, *what language do you use?*

If you find this to be a problem, it's been suffered by the legal profession, the medical profession, and scientists before the advent of informatics. We must develop a lexicon that is more understandable to the general population. The alternative is worse misunderstanding of the public. (The author admits guilt to this failing, but can't help himself.)

*Speaking of jargon, I can't resist inserting this— Once I inquired of a hack why TSS had just crashed, and was told that it had been "brought down by a flying patch"!*

Editor

### Random Bits:

Flaky hardware remains a serious problem with UNIX. Some files and directories are lost with almost every crash.

These CSC period of inaction is ending; one meeting was held last week. Steve Johnson of Bell Labs spoke, and the talk was very enjoyable (details elsewhere in this issue).

There is now a userid "UNIX" on VM/CMS.

Next Week: More invective on IBM.

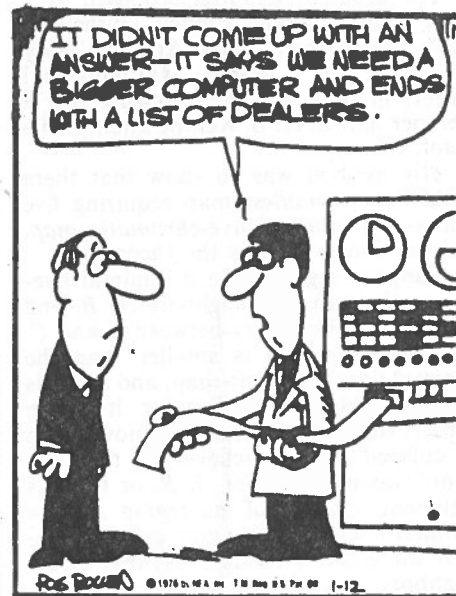
Rumor has it that the politicians intend to do away with Hallowe'en altogether and move it to Christmas. Here's how they'll do it...

Hallowe'en = Oct 31  
 =  $3 \times 8 + 1$  ...octal 31  
 =  $2 \times 10 + 5$  ...decimal 25  
 = Dec 25  
 = Christmas

Thanks to J. Wong for the proof.

That's all for this week folks since we're getting writer's cramp. Keep those cards and letters coming. Remember on TSS to send mail to scveffer or rhtakashima. Please sign the mail messages so we know who you are. If you don't we have no way of knowing whether you are male or female. So if we don't know we will refer to you as male, which could be a drag if you aren't. And don't forget the Mathsoc/JJBT hockey tournament. See you next week.

Sam'n'tak



Serious?

- 612 wgmerrick wed nov 10th 13:10
- 018 nwwitchlow wed nov 10th 13:01
- Hey guys, how do you get an or-bar on a LSI? (I'm quite serious!)
- 613 nwwitchlow wed nov 10th 13:10
- 006 wgmerrick wed nov 10th 13:05
- First you put the or-bar on a duck, then you transpose it to the LSI.

Found in mathNEWS/mail-box.

Go placidly amid the pigeons and caretakers and think what peace there would be in the absence of dpbrown. As far as possible without surrender be on good terms with a hack for he can detail the wonders of the TSS. Speak your COBOL quietly, for no one wants to hear; and listen to others, even the dull and ignorant; profs too have their story. Avoid loud and aggressive persons, for surely they come from the AIA. If you compare yourself with others, you may become discontent; for others will always get greater OSAP loans/grants than you. Enjoy who you've got as well as entertaining plans for those nice first-years. Keep interested in your option, even if it's CA; for someone will always require an audit. Exercise caution when using SNOBOL; for the compiler is full of trickery. But let this not blind you to what is left of DEBUG; many persons strive for high marks; and on WIDJET life is full of heroism. Be yourself, and have everyone laugh at you. Especially, do not feign knowledge of algebra. Neither be cynical about Honeywell; for in the face of all the crashes and disenchantment, mail is still fun. Take kindly the counsel of the consultant, gracefully surrendering file permissions. Nurture strength of spirit to shield you in drunken stupor. But do not distress yourself with transformations. Many fears are born of n-space. Beyond a wholesome discipline, watch what you eat from C&D. You are just food for the university, no more than a BIU on the hoof; you have no right to pass STATS. And whether or not it is clear to you, integrals never unfold. Therefore be at peace with Dean Forbes, whatever you conceive Him to be, and whatever your useless labors and misinterpretations, in the noisy confusion of the math-lounge, keep peace with your tutor. With all its sham, drudgery and broken dreams, some people still graduate. Be careful. Strive for the pub.

Found in an old, battered  
DEBUG shrine, UW, dated 1984

## Humor?

Dear mathNEWS,

An engineering student and a math student had a couple of blind dates one night. The following morning they met in the hallway.

When the engineering student was asked about his date, he replied, "Well, she was electrical, but not civil!"

When the math student was asked about his, he said, "Oh, she was well rounded, but square."

Interested student

Thanks for the cartoons. If you send us the originals, we may use them in a future issue.

Editor

## Teaching of Statistics at Canadian Universities

It has for some time been the concern of employers that some topics in statistics have been receiving undue emphasis while some others have been almost neglected in the courses taught by different universities. Particularly it was suspected that topics like time series, survey-sampling, etc., were being taught rather exceptionally at Canadian universities in spite of their economic importance. In any case we decided to collect some data which might reveal the actual situation.

Graduate and undergraduate calendars for 1974-75 were requested from 53 Canadian universities, and were received from 34 of them. A few of these 34 did not send a complete set of their calendars. Some volunteer undergraduates at UW noted the calendar descriptions of all courses involving statistics or probability significantly.

Each course so noted was first classified as "Introduction to Methods" or "other". Non-introductory courses were then classified according to subject matter. The majority of courses were found to be one-term or "half" courses. Full or year courses were counted as two half-courses. If a course which was not counted as "Introduction to Methods" spanned more than one of the subject areas, with what appeared to be an appreciable amount in each, it was assigned to the appropriate "partly on topic" columns.

A few subjects taught mainly by non-mathematics departments were left out of the tabulation, notably statistical mechanics.

### Remarks:

Apart from the incompleteness of the calendar collection, there are of course several reasons why the data of the table must be interpreted cautiously. Many courses which are on the books, particularly at the graduate level, are taught infrequently. Even for frequently-taught courses, it is difficult to assess the depth and content from title and calendar description. We can only hope that the inevitable classification errors have tended to cancel each other out, rather than bias the results very heavily.

The following are some (very tentative) surmises.

□ The most popular topics in mathematics departments are design of experiments, stochastic processes, estimation and hypothesis testing, and regression analysis.

□ Certain subjects of economic value such as survey-sampling, statistical computing, and time series are poorly represented at various departments of mathematics; the latter two subjects appear almost totally neglected.

□ Most statistical teaching in terms of number of courses is done by or at least attributed to non-mathematics departments. The large number of non-introductory courses so offered is rather surprising. In particular, multivariate analysis is most often offered in social science departments!

M. E. Thompson  
V. P. Godambe  
Statistics Dept.

### Number of Half-Courses

	←←←←←MATH→→→→→				←←←←←NON-MATH→→→→→			
	UNDERGRAD		GRAD		UNDERGRAD		GRAD	
	Fully on topic	Partly on topic	Fully on topic	Partly on topic	Fully on topic	Partly on topic	Fully on topic	Partly on topic
Introduction to methods	81	1	0	0	175	28	54	5
Design of experiments	18	48	14	9	7	43	18	25
Survey-sampling	9	40	8	0	2	41	5	13
Regression analysis	5	69	7	10	0	50	3	19
Econometrics	0	0	0	0	41	0	42	0
Inference or estimation & hypothesis testing	27	87	37	3	4	48	7	26
Probability & stochastic processes	72	53	46	1	17	24	27	12
Statistical computing	2	1	4	0	0	5	4	4
Multivariate analysis	3	3	21	3	5	29	13	17
Time-series analysis	1	4	4	0	1	11	4	3
Non-parametric statistics	5	29	11	0	4	11	6	6
Topics	5	0	26	0	6	0	8	0

"Topics" courses were non-introductory courses in statistics whose content was left up to the instructor.

# WATMAP: A Guide to Suicide!

or

## How to Appreciate Structured Programming

### A Glossary of CS 150 Terms by Bren Rhoquar

It has come to our attention that due to the complex nature of the CS 150 (old math 132b) course material this term, a definitive short explanation is needed for the many versatile terms used in computing.—*frog, crap out, etc.*

In order to fulfill this need and to kill some time before the weekend, we have compiled this wealth of information and are just now releasing this layman's guide to the general public.

The opinions expressed herein are solely those of the author(s) and in no way reflect those of the bumbling sub-humans we call classmates! All material has been drawn from lectures, tutorials, and tests. This glossary will no doubt be of extreme importance to those students who are gifted and/or masochistic enough to take CS 150 in their later years.

One should become acquainted with these terms and attempt to use them as often as possible in polite conversation. Your friends will be amazed, girls will flock to your side, you will be a real *man!* This will be unfortunate for those readers of the feminine sex, but that is the sacrifice for taking this course. Use these words for only a few minutes each day and if not completely satisfied, return them for a full refund (exactly what you paid for them minus a slight service charge to cover postage and handling).

**Bomb:** To be unsuccessful. As in: "he bombed the computer final." Usually occurs on the last possible run before tutorial time.

**Crap out:** The interpretation of this term is left to the reader. (hint: most often the work of a subversive and insipid library subroutine)

**Push:** Operation carried out on a memory stack. (Antonym: Pop)

**Pop:** Operation carried out on a memory stack. (Antonym: Push)

**Memory stack:** Entity operated on by push and pop.

**Dump:** Frosh-like programming results or a collection of extraneous data items numbering in the untold thousands.

**Frog:** What a program may do if you make the slightest syntax error which throws one to the mercy of the WATMAP compiler and thence to the "WATCHDOG" processor. (Do you believe that? A "Watchdog"?)

**Fall through:** To unaccountably disappear into the works of the computer.

**Fall out:** Results of a WATMAP program run accidentally with a \$JOB WATFIV card.

**Watchmo:** An object guaranteed to baffle second-year computer science

students. (Produced by the Watchmos Company [to obtain yours, simply write your name and address on a sheet of paper and send it to this address: Watchmos Co., c/o Dept. of Computer Science, UW. You can expect delivery of your watchmo within two months. Please submit a registered check for the correct amount. No C.O.D. orders please. Ontario residents add 7% sales tax. All others add 50% sales tax.])

**Gizmo:** An object guaranteed to baffle anyone. If anyone knows what a gizmo is, and how it differs from a watchmo, could they contact the author(s): we don't have a clue!

#### Authors' notes:

These items are included in assignments to add to the humor involved in doing programs well into the wee hours of the morning on a hypothetical computer, using a hypothetical language, striving, we fear, for hypothetical marks.

N. B.: problems are also hypothetical.

N. B. Frosh: For a meaning of hypothetical, see: quite complicated.

AQ: Gesundheit!

+470010005: Stop. Halt. Cease. Desist.

$C(IADR) = C(C(IR4)) + 1$ :

??????????????

MQ: You're welcome.

**Garbage:** Entire contents of a WATMAP program, including instruction codes, data cards, etc.

**Junk:** The contents of a WATMAP program between two(2) specified instructions or data cards.

**Pseudo-op:** A practically useless WATMAP operand which does nothing of any importance. (Used in at least 40% of an average WATMAP program.)

**Quizz:** The computer science version of the "quiz". This version, however, contains at most one question, lasts at most 5 minutes, is worth at most 5% off the final mark, and requires at least four 222's to get rid of the headache afterwards.

**Ass.:** Any of a number of words beginning with these three letters—assignments, assembler, assistance, etc. (Used as follows: pick up ass.)

**To go away:** To disappear into a part of the computer/program where nothing has any business being. If the user is not careful in such situations, his/her program may "crap out". (See: Crap out)

**To somehow tell:** A phrase used in lectures which means to instruct the computer rather explicitly.

**It goes down to about here:** Statement used in defining the size of an array. (Must be accompanied by a finger pointing at a bunch of boxes and arrows on a blackboard).

**Somehow make a note to yourself:** To trench in your memory (i.e. this material is on the final).

**You know:** Used as: "You can do it this way, you know." You don't and you probably never will.

**Quite complicated:** Virtually impossible.

**If you want:** Course requirement. Used as: "You can bring your text to the final, if you want." (true form is: "if you want to pass.")

**Bang:** Another operation on a memory stack. This operation is a combination of both push and pop.

**All kinds of junk:** Contents of the WATIAC computer after an unsuccessful program run. (See: Dump)

**Somewhat expensive:** Cost of an average WATMAP job. (Illustrates the rate of speed at which the computer works).

**Seem to be confused:** Phrase encountered during lectures. Meaning: entire class completely lost.

**Ponder that:** "Think about that and come up with the same conclusions I do."

**Now the fun starts:** Phrase used when entering a new section of work. (See: Quite complicated)

**Normal, ordinary, straightforward:** Used with reference to addressing techniques which include:  abnormal, ordinary, straightforward  normal, extraordinary, straightforward  normal, ordinary, incomprehensible  abnormal, extraordinary, straightforward  abnormal, ordinary, incomprehensible  normal, extraordinary, incomprehensible  abnormal, extraordinary, incomprehensible

(the last is by far the easiest to understand)

**Our old friend:** Returning to an incomprehensible idea.

**Something a little funny:** Encountered in lectures, this phrase has come to mean something you cannot understand, but will be on the midterm!

P. S.: Was on the midterm! — Author(s).

**CS 150 midterm:** Often confused with the CS 150 final. The midterm is of the same difficulty as the final, but only 1/3 of the required time is allowed. All students who cannot think about three things while writing down another four are either executed en masse or failed miserably.



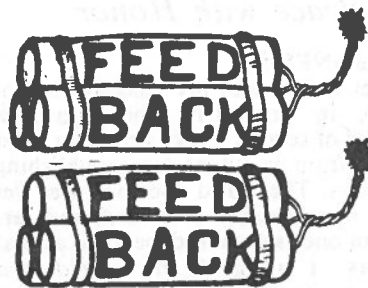


## C&D Suggestion

Dear mathNEWS,

The management of C&D might consider recording, daily, the times at which they sell out of each item (or the surplus of each item at the end of the day). Hopefully this would improve service and increase the non-profit.

Found in mathNEWS mailbox.



mathNEWS welcomes your criticisms, comments, suggestions, etc. All letters should be signed, but if requested, a pen name will be used. Put your Feedback articles in our mailbox on the third floor outside the lounge, or mail it to us on TSS to userid mathNEWS, or take it to MC 3038 and have it put in our mail slot, or put it in the mail addressed to mathNEWS, MC 3038.

## Now, the AGA

Dear mathNEWS,

In case you guys haven't noticed there is a userid floating around called *genesis*. as past, present, and future president of the Anti-Genesis Alliance we would like to know exactly who this genesis userid is so that we can totally annihilate him, her, or it.

jbdoherty

## And the ASM

Dear Mathsoc:

We, the undersigned, feel that Mathsoc should immediately suspend publication of mathNEWS and dissolve the position of Editor. The A.S.M. (American Spelling Movement) has taken over the top positions of the mathNEWS and is even now trying to consolidate the party line.

We demand that the position of Editor be dissolved and publication suspended for a period of four weeks. Also a mathNEWS task force should be set up to investigate the corrupt ranks of the paper.

Derek Broughton

\$10,000

Dear dpbrown

Here's \$11000000.00

Keep her. Good luck.

gsoue  
/cc mathNEWS

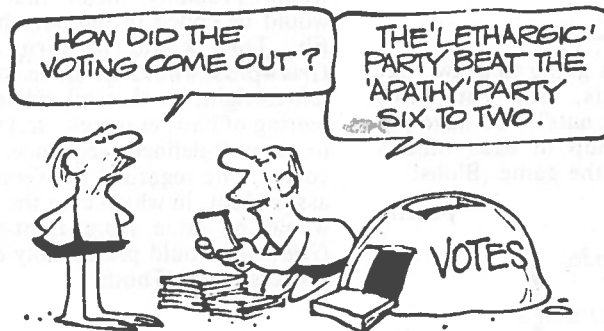
Dear mathNEWS,

In response to dpbrown:

You cad, bounder, infidel, churl, knave, dastardly doer of deeds, perverter of common logic, and insidious highwayman! You can have her—I can't claim her as a tax deduction any more, so I might as write off the liability!

retrogressively,  
hgalcolquhoun  
(who's [*sic*] name isn't  
all *that* hard to spell!)

P. S. I got the or-bar off the duck but he finally quacked up.....



Dear mathNEWS,

Re the apathy club proposed in last week's feedback. It should be apparent that the easiest way to ensure that the members are qualified is to declare everyone a member of the club, and then allow those who don't wish to belong to quit. Anyone who intended to quit but never quite got around to it would automatically be a member in good standing.

I. M. Apathetic should declare himself ineligible for membership in the apathy club, since he did actually go to the trouble of writing about it.

dcbrown

Dear Mathnews:

I can't be bothered joining an Apathy Club.

Why not a Procrastination Club? We could start *at the end of next week*.

No, I can't be bothered.

K-Airless

P. S.: I also couldn't be bothered spelling Mathnews correctly.

To I. M. Apathetic,  
c/o Apathy Club  
c/o mathNEWS:

I really don't care about joining the club, but I felt I should reply just to let you know you're not alone. No replies would have indicated either the degree to which apathy had taken hold in that no one cared to respond, or you alone are apathetic and your question did not apply to those who read your letter. The latter point has a flaw in that you are attempting to reach the apathetic readers but, similar to the point made by J. G. Kalbfleisch (page 3) in his analysis of Antical, the truly apathetic will not be reading mathNEWS. I must be an exception, hence the above point does not hold true—but what do I care?

In case I do decide to join your club, please do not consider this to be my response to your 10-word limit. That 10-word answer appears below:

*Why I am so apathetic:* I don't know and I don't really care!

Yours truly,  
(You really don't want  
to know, so I'm not going  
to bother to tell you.)

## Chess

To Sam'n'Tak:

No No No you hopeless blobs of gormless figgle! *K* is not a symbol in any possible way for a knight! Also, *Kt* is archaic and no longer used. Just because your 1956 "How to Play Chess Like an Expert in 37 Steps" by Fred W. Gormless uses it. *N* is the symbol used (of course all of this is in the English language). You could just as well have written PRBGQK using a *G* for "knight", you knerds. And as for your position, I have yet to see a board so:

Good grief! I was going to draw your ignorant hypothesis, but you have "PRBKQ?". Are you nuts? You have put the knight and bishop in each other's place! You disgrace the game. Blobs!

pckelly

## Mod 2<sup>36</sup>

system ?asm /facto;/mult s  
s#c522t  
normal termination

system ?go  
=4

4 factorial is 24

system ?go  
=7

7 factorial is 5040

system ?go  
=15

15 factorial is 2004310016  
[sic]

system ?go  
=5

5 factorial is 120

system ?go  
=2

2 factorial is 2

system ?

Found in mathNEWS mailbox.

## Peace with Honor

Dear mathNEWS,

I feel I must add my voice to that of arwhite, in protesting the infamous *Gridword* of several weeks ago. You must simply refrain in future from publishing such things. The world does not need yet another non-portable *Gridword*, and certainly not one as system-dependent as that one was. I suggest that *Gridword* production be integrated with the Portable Software Group's other efforts. This would probably mean that *Gridwords* would be coded in the portable language Eh. This would in turn imply that *Gridwords* would be done strictly from left-to-right, so that all side-effects (e.g., tearing of hair, erasures, etc.) would occur in a well-defined sequence, unless, of course, one regarded the *Gridword* as an assignment, in which case the whole thing would be done from right-to-left. The *Gridword* would presumably execute as a process under Thoth.

chforsyth

P. S.: I suggest also that we put aside our minor differences, and work together, as a society, to

PUT THE "U" BACK  
INTO "HONOUR"

(also "rumour", "colour", "msbrader", etc.).

The Americans tried making "peace with honor" in Vietnam [sic]; look what it did for them. Things would almost certainly have been better if they had tried "peace with honour".

No.

Dear mathNEWS advisor:

Pardon my ignorance on the subject but why?

Fubar

## Actually, we Goofed.

Messrs. Brader and Leibman:

What justification do you have for associating my inspired writings with the ramblings of Judith and Maccabees? Surely you realize that as the wisest mortal of all time, I have produced works which are holy to all true believers, as well as to the adherents of many of this world's false religions. Apocryphal indeed!

Possibly you have confused me with that impostor Ecclesiasticus, but this ignorance is no excuse for your miscarriage. I expect a full apology in the next issue of your magazine. Remember, even though I'm dead, I have relatives in high places (my great<sup>n</sup>-granddaughter is on your \$1 bill).

Solomon ben David  
(aka Ecclesiastates [sic])  
Third monarch of the  
united kingdom of Israel

Vvvvvv vv vvv Vvvv

Dear mathNEWS,

I'm glad to see you are enlightened about the use of the letter "u". However, yo do not carry it far enough. The Americans had already to learn abot this heinos letter when they deleted it, partially, from the ANS version of the english langage bt in two hndred years, no progress has been made. I sggest that yo learn from the Romans who wisely deleted it completely from their alphabet.

Perhaps if we all contribvte, we could encovrage the letter-by-letter shrinkage of ovr alphabet down to nothing bvt v's. We could start by changing the a's to v's vnd then work ovr wvy through the rest of the vovvls vntvl thvrv wvrv nv vvvvls lvt.

Thvnk vf hvw mvch vvsivr spvllvng wvvd bv!

Thvn vv cvvld wvrk vvr wvy thrvgh thv cvnsvntv vntvl vvvrv lvtvtr wvs thv lvtvtr "v".

Vvvv vvvvv vv vv vvvv vvvvvv vv vv!  
Vvvv vvvvv vv.

Jim Hoffman

## JJBT Strikes Out

Dear SICnews,

This is in reply to the feedback of Messrs. Ian & Jibrah. They did not know the original intent of the score, as it accompanied a metric music column last winter. As the co-writer (Barry Tone did most of the work) of the JJBT symphony, I must take issue with their suggestion that the music was bad. They obviously don't know how to read metric music, and obviously don't have distempered clavier let alone trombones or sitars. The music presented in the second to last issue can actually be played, and in my subjective opinion (and also that of Catfish Leibman, and rssteiner) is an absolute masterpiece of distempered virtuosity.

Peter C. Chynoweth

If this issue is late, it is because (\*\*just changed the ribbon on this antique Mathsoc typewriter--what a messy operation ...) certain Honeywellians decided to use Wednesday morning for system testing without telling us... this is being typed, therefore, 04:00 Thursday--Rag said GS said thxey aren't too busy so you may be reading this on Friday. Anyway, contributors and other producers and signatories to this issue were, in alphabetical order: MARK S BRADER the editor, DEREK BROUGHTON of asm, DAVID BUCKINGHAM of csc, RAY D BUTTERWORTH very useful layoutist, HGACOLQUHOUN, initially MADDOG, pandemically G G DRYDEN, remotely J F GENTLEMAN, JOHANN GEORGE also csc, V P GODAMBE via jfg, J J LONG (but not retroactively), KEN LYNCH (I'm with you on this one!), bereaved BOFF briefly, ADRIAN R PEPPER front page csc, NICK REDDING front page dc, "BREN RHOQUAR" the lexicographer(s), ERIC SIEGERMAN another layoutist, PETER F STEVENS 001000100010001000100, RJTAKASHIMA, M E THOMPSON via jfg, SAM VEFFER too, and initially X!, plus GPEMBRO's scissors (Where did ours go?). New record--most letters in one issue. Most people in masthead? Most news from different depts? (Why AM? Ballistics, of course.) And ANONYMOUS p.5 contributor!