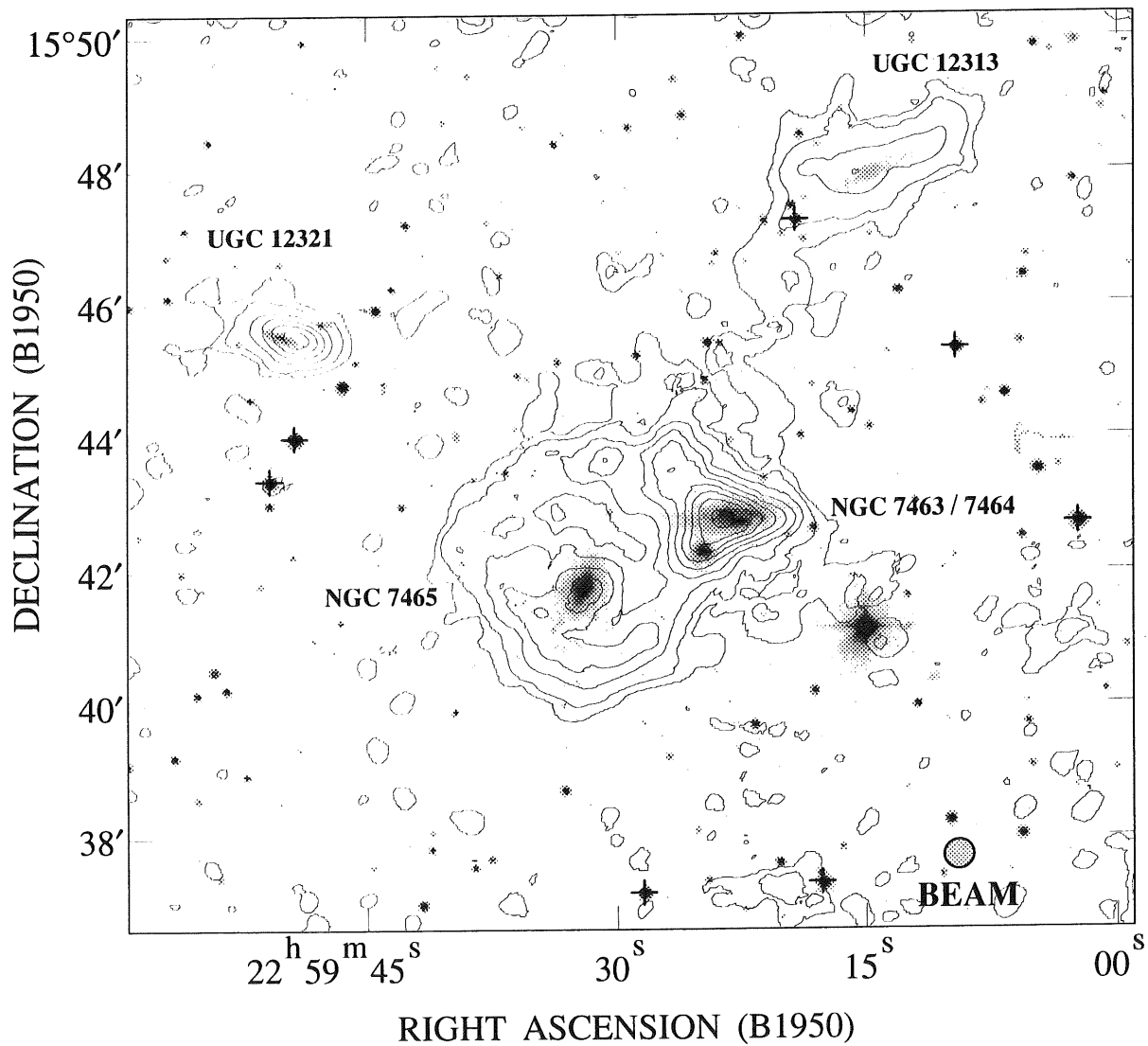


THE DAVID DUNLAP DOINGS

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NGC 7475

FROM THE EDITOR

John Percy writes: “A consortium of scientific and educational organizations in Ontario (including the University of Toronto) has prepared an excellent fact sheet about the May 10 solar eclipse, and how (and how not) to view it. Copies of this sheet are available in the department. Please spread the word. Many of these same organizations, under the leadership of the RASC Toronto Centre and the Ontario Science Centre, have arranged an impressive series of activities for Astronomy Week — which is actually being celebrated over a two-week period (approximately May 1 to 14) around the eclipse. Information will be posted in the department, and in *Scope*, the newsletter of the Toronto Centre of the Royal Astronomical Society of Canada.”

There will be two other astronomical events this summer, the collision of Comet Shoemaker-Levy with Jupiter in July and the Perseid Meteor Shower in August, that are likely to attract a great deal of attention from the media and public. These are excellent opportunities to raise our profile with the public and the University. These activities can be time consuming, but they can pay off in the long-term. If you don't believe me, look up Clarence Augustus Chant's autobiography and read the story about how he raised the money to build DDO.

We nearly dropped the ball last year when we didn't anticipate the enormous public interest in the Perseid meteor shower. I was the only faculty member available to deal with media requests (Coincidence? Some say no.), and the 1.88-m telescope was shut down for engineering. It didn't look good when several hundred people gathered spontaneously on the Observatory lawn to watch the meteor shower. If it had not occurred to me at the last minute that someone should be at the Observatory for security purposes in case a *few* people showed up, we would have been completely embarrassed. We've got to do better this year.

Tom Bolton

COVER STORY

Gang Li & Ernie Seaquist

Small groups of galaxies are excellent places to look for signs of galaxy interaction and to study interaction-induced star formation and galaxy evolution. The figure on the cover shows such an example, a small group of five galaxies, four of which show tidally distorted HI morphology and kinematics with extensive HI emission between the galaxies. The HI image (shown in iso-intensity contours) was made with the Very Large Array of NRAO and the grey scale image is an enlargement of the POSS blue plate digitized at DDO (thanks Karl!). The projected diameter of the group is only $\sim 6'$ (50 kpc at a distance of 29.5 Mpc) with a radial velocity range of ~ 500 km s⁻¹.

The primary target of the observations is NGC 7465, a barred lenticular (?) galaxy with a possible active nucleus. Most of the HI emission toward the galaxy is from an arc-like feature to the south/southeast of the galaxy. Together with some weak features to the north, they form a complete ring around NGC 7465. Judging from the orientation of the ring (which is nearly face-on) and the galaxy (which is close to edge-on), the HI ring seems to be a *polar ring* around NGC 7465, possibly formed out of material pulled out from the nearby NGC 7464 during a close encounter. The galaxy shows an optical spectrum which is intermediate between a starburst and a Seyfert 2 galaxy. Therefore, we are likely witnessing an AGN in the making. Detailed accounts of the HI observations will appear in AJ, June 1994.

NGC 7465 and its surroundings are being studied at other wavelengths as well. Our OVRO CO images of NGC 7465 reveal an elongated structure with a position angle slightly offset from that of the optical PA. It is possibly a molecular bar, but we are having difficulty extracting kinematic information due to the poor S/N ratio. Deep optical images are also being made (in collaboration with Wim van Driel of Kiso Observatory) to study the faint optical features around some of the member galaxies as well as the structure of the galaxies themselves.

CONGRATULATIONS

Congratulations to Scott Tremaine (CITA) on his election to the Royal Society of London, one of four (count them, 4!) University of Toronto faculty to be elected this year.

Scott has also won a Killam Research Fellowship, one of Canada's most distinguished research awards. In the letter to the Department announcing the award Peter Martin noted that Scott is looking forward to being able to concentrate on his research.

Phil Kronberg's Killam Research Fellowship has been continued for a second year.

Congratulations to the consortium of Scott Tremaine, Dick Bond, and Peter Martin (CITA), Charles Dyer and Ray Carlberg (Astronomy), Martin Duncan (Queen's) and Hugh Couchman (UWO) who have been awarded \$280,000 as a Major Equipment Grant to purchase a large computer.

Congratulations to John Percy on his election to the Board of the Astronomical Society of the Pacific. The ASP is an international non-profit scientific and educational society, founded in 1889, that works to increase the public understanding and appreciation of astronomy. The ASP publishes a popular magazine *Mercury*, a technical journal *Publications of the Astronomical Society of the Pacific* (graduate students: you can publish the abstract of your thesis there!), and the Conference Series — the fastest and most cost-effective series of its kind. It produces a teachers' newsletter, and some of the best slide sets and other educational material around. It holds a broadly-based annual conference with things of interest to professionals, amateurs and teachers.

STAFF CHANGES

Rob Ivison is leaving to take a position at the Royal Observatory Edinburgh after spending a couple of years as a Post-Doctoral Fellow working with Ernie Seaquist.

Five undergraduates will be working as summer research assistants in the Department this year. They are: Tara Rosebery (supervised by Christine Clement & John Percy), Allen Attard (Charles Dyer), Denise Giguere (Howard Yee), Inese Ivans (Tom Bolton), and Gregg Wade (Tom Bolton, Don Fernie, & Nancy Evans). Let's all make them feel welcome.

COMINGS AND GOINGS

Phil Kronberg was the colloquium speaker at Cornell (Astronomy and Space Sciences) on 1994 March 4. His talk was "How Ordered and Widespread are Galactic and Intergalactic Magnetic Fields? Recent Trends in Observation and Theory".

Phil visited Korea during April at the invitation of the Korean Science Foundation (KOSEF). He gave lectures at three Korean Universities, the Korean Electronic Telecommunications Research Institute, and was a guest speaker at the Korean Astronomical Society's bi-annual meeting in Seoul in mid-April.

John Percy attended the board meeting of the Astronomical Society of the Pacific in San Francisco in March. While in San Francisco, he visited BSc alumnus Doug Johnstone, who is finishing up his PhD with Frank Shu at Berkeley. Classmate Rene Plume is finishing up his PhD at Texas (and is engaged to be married in October).

Karl Kamper attended the SPIE/AAS meeting on Astronomical Instrumentation in Hawaii in March to try to catch up with the latest in detectors and active optics. The latter is now going very commercial with quite a few manufacturers exhibiting active mirror assemblies. On the way back, he observed at Lick for four nights (Finally, jet-lagging in the right direction!). A reasonable number of observations were obtained in spite of the traditional March ice storm, which, however, provided the proper atmosphere to commune with James Lick in his tomb in the telescope pier.

Michael Allen reports the gossip from a recent visit to the VLA.

I was up late one night in the new visitors' residence at the VLA waiting for some water to boil to make tea when I encountered another night hawk, Anniela Sargent (I think), who had some time to observe a few T Tauri stars. I mentioned that I was from the U of T and then had to explain that the initials stood for University of Toronto. She already knew about us, since she had met Ernie Seaquist and Rob Ivison recently. She told me the following story about Ernie.

Apparently, when you observe with the Owen's Valley radio array, you have to operate the telescope for three-day stretches at a time. Ernie was not looking forward to this task, since it had been a long time since he had acted in this capacity. As it happened, Ernie's first three days were also on a weekend, when the Observatory was deserted. Ms Sargent was scheduled for the three days following Ernie, and apparently when she came to work, he was a wreck. He had spent three virtually sleepless nights worrying about the telescope so that by the end of the run he was tired and a bit out-of-sorts.

Considering the typical picture I have of Ernie, namely calm, collected, and in control, I was quite surprised . . . and pleased! It made me feel that all the worrying I do is not isolated to students. In fact, I was also told that Rob Ivison, who accompanied Ernie as operator, took everything in stride and was quite composed over the whole episode.

UNDERGRADUATE NEWS

Several of students from the class of 9T4 have plans to continue their academic careers in astronomy. Sara Seager has accepted an offer of admission from Harvard University, where she plans to do theoretical work on magnetohydrodynamics, Denise Giguere is going to Queen's University, where she will be working with Judith Irwin, and Gregg Wade will enter the astronomy program at the University of Western Ontario. In addition, Jason Harlow 9T3 will be going to Pennsylvania State University after taking a year's sabbatical to work as a Telescope Operator at DDO.

SHOP TEAM NEWS

by Tom Bolton

The past couple of months have been eventful for the Shop Team. First, we finished the new guide head for the UTSO CCD camera and shipped it to Chile; second, we completed a major rearrangement of the space at the Observatory; and third, we made significant progress in defining the computing environment at DDO.

The new guide head and associated projects (see below) have taken up well over a person-year of shop time, not counting engineering, management, and some software development time. The guide head includes a CCD guide camera that can be used for autoguiding. We have purchased a new PC computer and CCD camera control software to replace the Heurikon computer that was purchased with the Photometrics CCD.

The new guide head is the first stage of a two stage project to improve imaging at UTSO. Work on the second stage, a tip-tilt secondary mirror is already underway, and we hope to have it ready for installation this year. When it is completed, observers will be able to use the secondary and the CCD guide camera both for guiding and to remove image motion due to atmospheric turbulence.

In March we completed a major reorganization of Observatory space that saw the Sky Survey plates and films moved to the PDS room in the basement and the Catalogue Room moved one door south from its previous location in the northeast corner of the Administration Building. At the same time, perseus, the Observatory's image processing computer was moved from the PDS room to the new Catalogue Room. The desks in the new Catalogue Room were moved into the northeast corner room. This was an enormous amount of work that involved everyone on the Shop Team at one time or another. It's probably no coincidence that Frank Hawker and Dave Earlam went on holiday soon after the work was completed.

We accomplished several things with these changes. First, and probably least, we alleviated Facilities and Services' concerns that the Sky Survey might fall through the floor (not bloody likely, I say). Second, we rationalized the use of space by putting the Sky Survey near the PDS, where the plates are used most often. Third, we created larger, better lighted office space to house the engineering and technical staff. The combination of the image processing facility (which includes a CD-ROM drive) with the Catalogue Room is more functional, and the catalogues are protected better in a room that doesn't receive as much sunlight as the old room.

Last Fall, we decided that the computing environment for instrument control had become too heterogeneous and something had to be done before we could progress any further. I asked Stefan Mochnecki, Shenton Chew and Karl Kamper to study the problem and make recommendations about what computing hardware, operating system, and programming environment we should be using for instrument development and control. This proved to be a very difficult problem because of the various constraints imposed by limited resources, UTSO and existing instruments. After a great deal of discussion and consultation, both within and outside the Observatory, they recommended that we consider PC clones and the OS/2 operating system with software written in C++. We have purchased a new "development computer" which has been installed next to perseus in the Catalogue Room. Shenton Chew, John Pimentel, and Karl Kamper are using it to learn OS/2 and test the compatibility of this operating system with software and hardware already in use at DDO.

GASA GOSSIP

by James P. Brown

For the first time in a long time I have some good news to report. For the second year in a row the GASA recreational league volleyball team has qualified for post-season play. In fact, this year's team was so good that it managed to post a 19-1 regular season record. This year's loss came at the hands of a relatively low standing team. I suspect that they were so intimidated by our record that the captain brought in some "ringers" from the intermediate and competitive divisions to help them win. Speaking of the intermediate division, I should announce that the intermediate team barely missed the playoffs this year. After what amounted to a relatively disappointing season last year, it's good to see the team on track for next year. Playoffs begin the week of April 18th and we wish the team well.

On Friday, March 25th, GASA held its annual Vernal Equinox Party at Tom and Susan Bolton's home. First I would like to say that our distant cousins in Physics attempted to hold their own Vernal Equinox BBQ the week before. Needless to say GASA assures anyone who may have been concerned or confused that these pretenders to the Vernal Equinox are nothing more than interlopers intent on stealing yet another great idea from Astronomy. Since their department is so riddled with apathy and disinterest, it doesn't surprise me that they would pull a stunt like that. However, in the future I think we should tell these freeloaders that if they want to have a spring party they should find their own annual event to celebrate. Now that I've got that out of my system, I should say that it was a very enjoyable evening, despite a low faculty turn out (surprise, surprise). The Bolton's have a nice home, or I should say, will have a nice home once they put in a driveway and a road. Other than that it was pretty much your standard sub-zero outdoor BBQ event.

While we're on the subject of parties, I should talk about the department's new collection of art around the 14th floor. A little while back a loosely defined group of students decided to hold an even more loosely defined party. The party featured an assortment of people, food, drink and activities. One of the more popular activities was colouring and finger painting. The art which now graces our department is the product of this activity. I won't speculate about any of this art's value but I will say that the department has never looked better. I mean, I was getting tired of looking at the same putrid coloured walls (especially that colour by the elevators, whatever it is).

I was all set this time to give my usual rant against the department. However, circumstances dictated that I drop my original topic, or I should say postpone it until a future issue. As I scrambled to come up with a new rant, I realised that the department took away some of the juicier targets. For example, I got really worked up when I found out the department was going to implement a new phone system which completely ignored the student complaints of the last 10 years. I sat in on the first staff meeting to address the issue and then found out that the department wants to be reasonable about the whole issue and is going to re-evaluate the situation. I discover that there is a proposal to rework the allocation of travel money from the Reinhardt fund. Oh Boy! Here's something I can take apart. A staff meeting comes around, and everyone decides to be reasonable and reject the new suggestions. What gives? I guess for this issue I'll give the department a free pass and not give my usual tirade against the system.

DAN'S UNIVERSE

by Dan Hudon

I've always been a sucker for a good quote. "God does not play dice." "And yet it does move." "One day, Sir, you may tax it." And so on. The best quotes are the simplest. They become aphorisms, the words of wisdom that are bandied about by the population unaware that they first came from the mouth of some ancient philosopher. Know thyself. Man is the measure of all things. So familiar that they no longer need quotation marks; speaker and circumstance have disappeared, trodden under use.

Then there are the longer quotes. They have more to chew on, more to wrestle with. I came across one recently, which is really the one I wanted to talk about. It's from Loren Eiseley's excellent book, *The Firmament of Time*, and reads, "The special value of science lies not in what it makes of the world, but in what it makes of the knower." Eiseley attributes it only to "a perceptive philosopher." No matter, I like it. It has a couple of big hooks where you can latch on and grapple with it. The first hook, and this takes some reminding, is that science has a special value. The pursuit of knowledge as embodied in facts, observations and theories is a worthwhile endeavour. We build a Universe out of the facts we collect. My Universe is different from your Universe. The catch is that that's the whole point. It's not a question of being bigger or better. Just different. But, to be honest, and this is the second hook, I have no idea what my Universe is making of me. Well, I have some idea. It's making me a frustrated person as I stumble over various problems in the analysis of my data. Facing what you don't know every day is not easy. When you're through sending e-mail, roaming the Internet and yakking in the hallway, it's still

there, waiting for you to sit down and do something about it. IT - the problem, the unknown. While my frustration grew after trying so hard to make something of the unknowns in my world and my Universe and my data, I found such a contrary view refreshing.

Thomas Huxley likened scientific research to a chess game in which the player on the other side is hidden from us. "We know that his play is always fair, just and patient. But we also know, to our cost, that he never overlooks a mistake, or makes the smallest allowance for ignorance." Research is a game and by playing it we are learning the rules, the laws of nature. By playing the game, one move countered by another, we are making something of "the knower." Obviously, some moves count for more than others. Some phenomena take more grappling before they are understood. But the little ones cannot be overlooked — the small corrections to the data, the tweaks to the model — subtle and sometimes devious, they are still a part of the game.

It was Aldous Huxley who said, "Even if I could be Shakespeare I think that I should still choose to be Faraday." That is, given the choice between understanding the ways of man and the ways of nature, he would choose nature. Yet the two don't have to be mutually exclusive. Not that scientific research will tell us about love and lust and hate. We don't expect it to. But in astronomy, for example, by seeking new phenomena and new correlations, by challenging known physics with the extremes of the Universe - temperatures, masses, densities that range over several (or several dozen) orders of magnitude, we push at the boundaries of nature, and of our own understanding. We "know thyself" and the ways of man by pursuing the limits of what we know. (Despite the era of committees, grant proposals and funding cuts, for some reason I suppose I'm naive enough to think that such a romantic view of science is still tenable.)

We all have our stumbling problems at the boundary of what we know. Pushing at the boundary helps us understand our capabilities and limitations so that collectively we can transcend them. Pushing at the boundary allows the Ulyssean adventure of science to continue - "to strive, to seek, to find and not to yield."

MENTORSHIP PROGRAM

by John Percy

Faculty (and graduate students?): You will shortly be invited to sign up as mentors for the University of Toronto Mentorship Program, which enables outstanding senior high school students to work on research projects with you. I started out, several years ago, taking one student each year. This year, I took three - they were simply too good to resist.

Winnie Au has been analyzing photometric data on small-amplitude red variables, taken with the Automatic Photometric Telescope in Arizona; her results will be presented as part of the 1994 ASP meeting. Matt Szczyzny has analyzed a decade of photometry of P Cygni, using both Fourier and autocorrelation methods. Lawrence Yu has analysed a decade of photoelectric data on small-amplitude red variables, obtained by the AAVSO; his results will be presented at the 1994 AAVSO Spring Meeting in Houston. I urge you to consider signing up for this program. The students can be quite inspiring.

THE BEST(?) OF THE TEA MESSAGE

From: Daniel Hudon <hudon@mordred.astro.utoronto.ca>
 To: maildis@astro.utoronto.ca
 Subject: ** Tea and cookies in the lounge at 3:30pm **

The InfoSup

“The Information Superhighway is coming! The Information Superhighway is coming!” (every media outlet in the Universe, 1994)

“The sky is falling.” The sky is falling!” (Chicken Little, 1927?)

Unlike Chicken Little’s prediction, if we’re to believe the media moguls, it appears that the Information Superhighway (sic!) prediction is going to come true. And I for one believe everything that’s bludgeoned into my head seventeen times a day over a four month period - which is why I *love* election campaigns! In fact, this whole thing reminds me of a bad elections campaign. No new faxes! Read my chips! One thousand points of byte!

Who cares! Let it come. I plan to ignore it. I mean, it’s going to be like having twenty Sunday papers delivered to your door every day. Information. Wow! Information! Manna from heaven!

But let’s face it, is the InfoSup (man, if there’s one term that’s been crying out for acronymization, concatenation and abbreviation, it’s that one!) really going to help me make a better piece of toast in the morning? Like, can I put it on my cereal? Will it help me mow the lawn? Remind me when my mother’s birthday is? I didn’t think so. What really gets me is that it will probably need batteries too.

Tea and Cookies in the Astro-Lounge at 3:30pm.
 More information as it becomes available.

EDITOR’S CORNER

Abolish Faculty Final Exams II

In the last issue I asked the question, “Can anyone tell me why *Faculty* Final Exams are necessary?” Three weeks later I got my answer in the form of a letter from the Dean along with a three page memo from the Faculty Registrar, Dr. George Altmeyer. Ye Gods! The Dean reads the *Doings!* I’d better be careful, especially since I accidentally slugged her while taking off my coat last month. Well, she’s small, and the hallway was dark. Besides, if she knew me, she’d know better than to get close to me when I have limbs in motion.

Humor aside (Quick, somebody look. Is anybody laughing? Is the Dean laughing?) I'm surprised and pleased that Dean Chandler and Dr. Altmeyer took the time to respond to my polemic. Unfortunately, about half of the Dr. Altmeyer's memo addressed phantom issues, as far as I'm concerned, because my objection to finals wasn't as clearly stated as I thought. My primary objection to the present system is the use of large spaces, like the Benson Building and Varsity Arena, as exam halls. These spaces are often drafty and too cold, on rare occasions too hot, and almost always noisy. They are also much more susceptible to noise penetration from outside the exam hall than regular classrooms. Moreover, the cost of purchasing, maintaining, setting up, taking down and storing the tables and chairs used in these spaces must be substantial. I think it makes more sense to have faculty preside over their own exams in regular classrooms. This would also eliminate the cost of Chief Presiding Officers.

Dr. Altmeyer responses to my objections and my comments follow.

GA: Very few Departments are willing to use regular classrooms for final examinations: they want their students to be comfortably seated and to be able to spread out their examination aids such as calculators, textbooks, etc.

TB: That's a good point, but occasionally my students have had final exams scheduled in a room that didn't meet these standards. I've never been asked about my preference, nor have my students. On the other hand, when I polled my third year class about this I found that about half the class prefers the exam tables, even if they have to put up with noise and cold drafts. However, given a choice, they'd prefer to write in rooms with long tables, like the Physics Labs and 1318A.

GA: . . . by using the largest possible examination halls for the really large courses . . . we can minimize the number of Presiding Officers required from the Departments.

TB: I'm sure that's the way faculty prefer things, but I think it's an abdication of our responsibility.

GA: With regard to adverse conditions in examination halls, these situations do arise from time to time, but they could just as easily occur in a regular classroom.

TB: I don't agree. I've never encountered the kinds of problems with climate control and interior and exterior noise in classrooms that are routine in the Benson Building and Varsity Arena, not to mention the late, unlamented Drill Hall. Classrooms are designed and located to minimize these problems. The Benson Building gymnasias and Varsity Arena aren't.

GA: . . . without Chief Presiding Officers, Departments would take on the responsibility of protecting the confidentiality of the examination paper. Under the current system, no examination question papers are stored in Departments prior to the examination.

TB: Yep, that's the rule. I'm sure there aren't any large piles of questions papers sitting around departments, But if Dr. Altmeyer believes that some (many? all?) faculty don't keep copies of their exams, he must also believe in Santa Claus and the Easter Bunny.

GA: If any faculty member would like to run his/her own Faculty final examination, we would be more than happy to discuss the possibility.

TB: That's a well kept secret! This option is not mentioned in the Faculty's Academic Handbook. In fact, the wording of the Handbook's section of final exams appears to implicitly exclude this option unless you read it with the mind of a lawyer.

Since the students don't seem to mind the large exam halls as much as I think they should, I don't intend to pursue this matter. But I can't help wondering if their reaction isn't due more to the fact that they've had little experience with another system than anything else. Ah well. The customer is always right, even when they don't know what they want. I certainly will explore the option of acting as my own Chief Presiding Officer to see if I can't improve the exam room environment for my students. It will be interesting to see if this is a practical option.

Fin de Siècle

In late-1989 I innocently set off an uproar that disrupted my life for several weeks. Since the circumstances are likely to be repeated numerous times in the next few years, I am writing this as a warning to other innocents.

I was working alone at the Observatory one day during the Christmas break, when I received a call from the Toronto *Star*. Their reporter, Bill Taylor, if I remember the blaggard's name correctly, wanted an expert's opinion on the date that the last decade of the century would begin.

Since I'd never given this weighty issue the slightest thought, I was stumped for a moment. Thinking quickly, I remembered that since there had been no year 0, it must begin on January 1, 1991. I think I even threw in a reference to Arthur Clarke's *2001: A Space Odyssey* to support my position.

"But," says Mr. Taylor, "a lot of people think it begins on January 1, 1990."

"Well," sez I, "they're entitled to their opinion, but they're technically incorrect. In any event, I don't see any reason to get excited about this trivial issue."

WRONG! WRONG! WRONG!

My comments were reproduced the next day in a several column inch story on page 2 of the *Star*, and the sky fell in. Apparently large numbers of people care passionately about this piece of trivia. The Observatory and the *Star* were deluged with letters and phone calls for the next two weeks. It was the greatest reaction I've ever had from an "appearance" in the media, and its the only time I've had angry reactions. The tone of some of the comments suggested that some of the correspondents were, or had imbibed too heavily of, holiday fruit cakes.

I was reminded of this incident by Stephen Jay Gould's column, delightfully entitled "Dousing Diminutive Dennis's Debate (DDDD = 2000)", in the April issue of *Natural History* in which he recounts the history of this dispute. He describes how there have come to be two answers to this question: the logical, elitist answer (my answer), and the sensible, common answer (the one my critics thought I should have given), and explains why passions run so high over this apparently trivial issue.

Why bring this up now. Well, the next turn of the decade is the biggy. It's not only a turn of the century, but also the start of a new millennium. Some religious groups believe that the Apocalypse will come at the end of the millennium, so it's really important to know when that is. The exact time is already under intense debate in some quarters.

If you are one of those who frequently handles inquiries from the public and the media, be forewarned and read Gould's article. And whatever you do, don't refer any calls to me. I'm leaving town until after the Apocalypse.

Tom Bolton

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**PREPRINTS BY FACULTY AND STUDENTS
RECEIVED IN THE ASTRONOMY LIBRARY
1994 February 1 to April 11**

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