# Letters to the Editor

## Comments on Electronic Journals

Readers may be interested in the following [approximate] summary of my comments at the Round Table on Electronic Literature at the recent European Congress of Mathematicians [ECM2–1996] in Budapest; they relate principally to electronic journals rather than to books. I must make it very clear though that the comments represent a personal view and do not represent a "view of the London Mathematical Society"; indeed, no explicit LMS view exists.

There are real costs involved in producing a quality mathematics research journal, whether paper or electronic.

There are a number of myths around that support the flawed view that journals should be free or priced at minimal cost:

1. *All authors write clearly in good grammatical English with proper spelling and punctuation, so that even readers new to the field or readers whose native language is not English can read and understand the mathematics without difficulty or ambiguity arising.*

Not true! High-quality journals have to return something like 50 percent of papers to authors for them to improve the exposition and language. Even then many authors cannot achieve a satisfactory standard. A high-quality journal thus has to **pay** for a technical editor to go through every paper to "debug" the exposition.

2. *Authors will do the TEX typesetting work for a journal, so the journal typesetting costs will be nil or negligible.*

Not true! Even with TEX there are so many dialects that journals often have to spend large amounts of time modifying formats to standard formats. Too many authors insist on embedding their own personal macros or using special fonts (often proprietary fonts that cannot be used in an electronically available version of the journal without license). Quite often authors use TEX badly; for example, their files cannot be read. Many good authors do not use TEX anyway, and many journals do not wish to exclude those authors. Thus a high-quality journal has to **pay** for a technical typesetter to go through every paper to TEX it, to debug an existing TEX file, or to re-TEX it if the author's file is unusable. Such typesetting is an expensive skill that journals have to **pay** for.

3. *Individual journals will be available on the editor's server or his university server and can be accessed at any time.*

Not true! Editors move from university to university, servers get replaced every few years, universities have financial crises, technology moves on and files can no longer be read or printed easily, networks suffer e-congestion, working mathematicians get baffled as to where to find journals if there are too many possible locations, etc. Also, it is unrealistic to imagine that individuals' [or perhaps even universities'] servers can act as the "archive of record" for mathematical material. Mathematicians are sufficiently vain (not necessarily unrealistically) to imagine that their published work will be of interest to someone in 50–1,000 years, and indeed some of what is published at present will be. The problem is that we cannot easily identify which papers these are! Mathematics is a subject that develops like a pyramid (recall that Newton said that he "stood on the shoulders of giants"); therefore it is our duty for posterity to ensure that published work continues to be available indefinitely. This is

### *About the Cover*

The Sante Fe Train Depot and a modern highrise in San Diego, California. San Diego is the site of the 1997 Joint Mathematics Meetings, January 8–11. Photograph by Michael Ma Po Shum for Tony Stone Images.

something that publishers accept responsibility for and so **pay** for.

4. *Editors do their work at zero cost, as their universities absorb the cost.*

Not true! Editors run up quite large bills for postage (especially airmail postage), photocopying, and secretarial assistance, especially if they insist on papers being modified to be clearly written. Many editors proofread, as they believe that their reputations require this guarantee of accuracy. Increasingly universities are unwilling to allow academics to run up real costs (e.g., postage, secretarial time) without recompense; some ask for partial replacement for teaching too. The journal has to **pay** for these costs. Therefore, quality costs money:

1. to prepare the electronic files, whether for paper, server, or both;
2. to create accessibility of the material, that is, its distribution in the short term;
3. to maintain its accessibility in the long term.

If publishers have no income or little income, the necessary consequences are that:

1. papers will be less well prepared and less easy to understand;
2. in the long term, papers will simply "disappear".

This is not satisfactory; therefore, I believe that publishers (whether commercial, learned societies, or universities) will continue to have to charge for mathematics journals.

Where publishers differ is the amount that they need to charge subscribers to cover their costs. Mathematics research journal publishing is changing, and although the change (driven by factors such as personal computers, TEX, and the Internet) has been mooted for a decade or so, right now we are just entering the main period of very rapid change. In the next decade the mathematics community worldwide will be in a position to reach a new concensus with mathematics journal publishers over the vexed question, What are mathematicians prepared (or able) to pay for journals versus what can publishers afford (or are willing) to consider as a reasonable price for journals?

It is fair to say that at this point nobody can really foresee the formats in which electronic journals will be available in twenty-five years (to select a carefully-considered horizon) nor the precise charging mechanisms.

Finally, I believe that we owe it to ourselves and to our successors to agree to a "system" that will make mathematics research literature available now and into the indefinite future. Twenty-five years ago TEX did not exist, but unless the great research libraries are sent up in flames, like the Library of Alexandria, the mathematics research literature prior to TEX will continue to be available via print. There will be a market for both paper and electronic versions of journals for years to come, as each format has its own role, and I suspect that paper (backed up admittedly by secondary, regularly refreshed electronic files) will continue to be the principal archiving format for some centuries yet. Neither I nor my initial readers can know whether I am right!

*David A. Brannan*
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*(Received August 10, 1996)*

**Editor's note:** This letter also appeared in the Newsletter of the London Mathematical Society.

## Request for Information

I am interested in determining current usage of teaching methods developed at the University of Texas by R. L. Moore and H. S. Wall. I should appreciate hearing from anyone who teaches by a variation of "The Moore Method". If you respond, please indicate the courses involved, any comment you might have as to success or problems with the method, and whether you may be quoted.

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## A Clarification

I would like to clarify a point in the excellent article "New Directions at the IAS" in the November *Notices*. The proof of the conjecture of Kalai that was mentioned is actually joint work with Tom Braden. In fact, I had previously worked on this problem, but a solution emerged only when Braden joined the effort.

*Robert MacPherson*
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*(Received October 16, 1996)*

## Request for anecdotes

I am thinking of compiling a book of mathematical humor and would greatly appreciate any submissions. I expect to include intentionally funny things, such as clever reviews and mock problems and papers, as well as "bloopers". I am particularly looking for funny answers to questions on tests or assignments. Anecdotes about mathematicians, conferences, or the teaching of mathematics would also be welcomed.

The book would, of course, contain credit for authorship and/or discovery whenever I become aware of such. Of course, the presence of such credit on your c.v. is not likely to help you get research grants, tenure, or promotion in these serious times, but your submission may help others to laugh their way through difficulties.

I am seeking original contributions as well as already-published and previously privately circulated material. Please send anything you think might be suitable to:

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## Math Anxiety and Elementary Math Courses

The October 1996 edition of the *Notices* had an interesting juxtaposition of articles. There are two articles on Alan Sokal's parody appearing in the *Social Text*, and there is a forum arti-

cle on the need for publicizing mathematics.

For at least two decades, there has been a stream of articles, books, and what-not on the popular fear of mathematics. And mathematicians have felt a bit perturbed about math anxiety. Perhaps it pricked our consciences. Perhaps we feared that math anxiety would have some unfortunate effects—unfortunate for its victims (and perhaps for the economy). But the October issue showed, for the first time I remember in the *Notices*, some recognition that math anxiety is a major problem for the mathematical community itself.

What lies behind the hostility of the editors of *Social Text* and similar colleagues in the social sciences and humanities? Paralyzing fear of their inability in mathematics? Oh no, they see mathematics as a gigantic con game perpetrated by elitist authority figures, indeed a major tool in perpetuating the current power structure. Unlike Lancelot Hogben (of *Mathematics for the Million*), many modern critics of mathematics do not see mathematics as potentially empowering the masses. Instead they have declared the grapes sour, and are certainly not interested in *using* mathematics. I am only speculating, but I suspect that many social scientists and humanists who were exposed to classroom mathematics went through fear to frustration to anger.

And they are not alone.

Future academics are (face it) a demographically trivial group. In reality, masses of future nurses, journalists, schoolteachers, businessmen, writers, and lawyers are taking college algebra and suffering through it and hating it and, perhaps, us as well. These are the people who will pay the taxes that make up our salaries. These are the people who will vote for the politicians (who suffered through the same finite math courses their constituents did) who determine how much money goes for mathematical research and how much for peanut subsidies.

These are the people taking courses from poorly supervised adjuncts.

What do we expect from this? Do we even expect to produce a mathematically educated populace this way? When we complain that the public knows nothing about mathematics—that the public sees mathematics as only a maze of pointless formulas and intractable word problems—what does that say about the curriculum the public was forced to take? Indeed, look at any college algebra or finite math text. Five hundred pages of pointless formulas and intractable word problems (oh, yes, with motivation and sidebars and what-not scattered about lending more to distraction than illumination—do they even read all that?). Remember that these are essentially remedial courses: many of the students taking college algebra and finite math have already tried and failed. Many of them aren't up to covering a section per lecture period. Having them take those years of high school math compressed into two semesters does not seem to be the ideal way to get them to change their attitude towards mathematics. And look at their numbers: we are *not* talking about a trivial fraction of the population.

This last year, I have tried an experiment of sorts. I figured that since finite math is technically a liberal arts course, I would treat it as one. I would spend some time on *what* mathematics was about, not just on *how* to solve problems. I put some readings on reserve (usually about 20–30 pages) and I even assigned a term paper. In order to make time for this, I removed about a third of the syllabus. This also allows one to cover the material more slowly, and it won't cause problems because finite math really isn't a prerequisite for anything. (This brought up a new problem: students are not being taught how to write term papers—but that's another tirade.) I assigned readings like Chapter 16 of Morris Kline's *Mathematics in Western Culture* and Chapter 1 of Sheila Tobias's *Math Anxiety*. I asked them to turn in 3" x 5" index cards describing their personal reactions. The results are amazing. Students had never realized that Galileo did anything mathematical. Future school teachers had not realized that fear of mathematics was a major social problem, and not just a private scandal of their own. Contrary to what critics of today's jaded youth would expect, most students were enchanted by George Gamow's discussion of numbers in his *One Two Three…Infinity* (although critics of youthful apathy were vindicated by the students' bored reaction to Lancelot Hogben's revolutionary rhetoric).

The time has come for us to ask what these Math 101 courses are for. For many students, this is their terminal math course—at least until their employer compels them to take more. This is our last chance to present them with the idea that mathematics is more than something that resides reclusively in the math building. So I suggest as an experiment: look up those old popular science magazine articles, the classical popular books, and see if something like a liberal arts course in mathematics is there. It would at least give a new perspective to the subject.

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*(Received October 28, 1996)*

## Editor's Note

An outdated affiliation was given for Silvio Levy, author of "Systems Administration: The Mathematician's Perspective" (November 1996, pp. 1348–1352). He is a writer, editor, translator, and programmer in the mathematical and computer sciences. He is the editor of the MSRI Book Series and of the research quarterly *Experimental Mathematics*. His e-mail address is levy@math.berkeley.edu.