

# The Changing Nature of Mathematical Publication

We in the mathematics profession are witnessing significant changes and developments in the publication process. Electronic publishing, which is rapidly supplanting traditional hard-copy publishing, makes new research widely accessible, speeding up the publication process tremendously. Scientific breakthroughs can become part of our *lingua franca* in a matter of hours rather than months.

The purpose of this article is to announce a new publication column, *Scripta Manet*, for the *Notices of the American Mathematical Society*. We wish to address publication issues head-on. What, for example, is now the role of traditional paper journals and books? What does it mean today to “archive” scholarly work?

There is no doubt that the new media for publication have broken down social barriers. In the old days, mathematicians could send their preprints to a select few mathematicians and not to others. Today what is more typical is that a new mathematics paper will go up on the preprint server arXiv and then *everyone* can see it instantly. It can only enrich our culture to have more people made an integral part of it.

But there are both positive and negative features to posting a paper on arXiv. Because papers on arXiv are not refereed, we find here an undifferentiated melange of work; how do we know what is worthwhile and what is not? Is it not possible that readers of arXiv will gravitate to the work of established mathematicians and perhaps slight the work of new, younger people? That is an unfortunate side effect that could have a strong impact on our profession.

Furthermore, what are the copyright issues associated with putting our work on arXiv? If we ultimately publish our paper in a traditional journal, then how will that journal view our paper being first put on arXiv? If someone plagiarizes your work from arXiv, then what protections do you have?

Mathematicians and other scholars have long depended on publishing in order to (i) establish the priority of their results, (ii) make their scholarly reputations, (iii) attain tenure, and (iv) qualify for grants and other encomia. Deans and their committees tend to be rather stodgy; they are uncomfortable evaluating tenure cases that are based on electronic publishing. It is a brave new world that nobody completely understands.

Another vector in the modern publishing scene is open access journals. Initiated by people at the National Institutes of Health, these journals reject the traditional business model for an academic journal. Such journals do not have subscribers; they are freely accessible to all who are on the Internet. They are subsidized by each author

paying a (nontrivial) fee. Some have argued that this makes journal publishing like a vanity press—those who have the bucks can publish and those who do not cannot. Others have suggested that funding will shift: universities, instead of funneling their money to overpriced traditional journals through subscription fees, will instead provide funds for authors to pay their tithes to the open access journals. We might wonder whether elite, wealthy universities will have the means to make this happen while other universities will not. Is this system in fact re-erecting the social barriers that arXiv and other features of the electronic environment have torn down?

Electronic media are clearly shaping our subject in myriad other ways. Mathematical blogging is now a way of life for many researchers. It is now possible to put tentative statements, guesses, and even incorrect arguments on a blog and receive constructive feedback in return. Whatever its merits, a blog will contain largely undifferentiated, perhaps casually formulated, thoughts of dubious value. Is this methodology advantageous for the development of our subject?

Another interesting direction, initiated by Fields Medalist Timothy Gowers and others, is the “polymath project”. This initiative gets very large groups of mathematicians—sometimes many hundreds—to work together on a project or a problem. This project has been under way for more than two years now and has already met with some notable successes. It raises interesting questions, such as how the results will get written up, where they will be published, and who will get the credit. It is difficult enough to manage a collaboration of three authors. One shudders to consider controlling three hundred unbridled egos. Nonetheless, this is an exciting new direction in our field.

With issues like these that affect us all, we look forward to this new publication column being a dynamic and informative part of *Notices* discourse. We hope to showcase differing opinions and a broad panorama of information and experience. Our goal is to keep the readership informed and also to provide a forum for many views.

The first contributor to *Scripta Manet* will be Peter Olver, who is the new chair of the Committee on Electronic Information and Communication (CEIC) for the International Mathematical Union. He brings a broad, intriguing perspective to the subject. His topic is the changing nature of the mathematics journal.

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The inaugural installment of the *Scripta Manent* column, “Journals in Flux”, by Peter Olver, will appear in the September 2011 issue of the *Notices*.