Open Access: Friend or Foe?

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We kick off this publication forum by an in-depth article on open access and a second one on how one society is responding to the challenge.

The editors

The term 'Open Access' simply means making available scholarly publications free of charge to all users. Access to content can be given in a number of ways: via subject repositories, institutional data repositories, journal sites where there is no access restriction, and personal or departmental archives. Below is a brief description of who and what is driving Open Access and how it will affect authors, readers, publishers and libraries.

Introduction

Have you ever fired up Google, keyed in your intelligent search term, and been rewarded with a nice short list of relevant hits, only to discover that the top five all point to the same resource and that your credit card number is required before you can view the sacred text and images? I find it very frustrating, and I'm one of the people responsible, in my role as an employee of a Learned Society Publisher, for managing these traditional 'pay-for-view' and subscription-based financial models! Open Access (OA) is said by some to be the answer. It is also said to be the solution to the 'serials funding crisis' being experienced by many libraries, i.e. the increasing cost of journals (average annual increase of 5–7.5%) versus decreasing library budgets (average annual cuts of ~5%).

General perception of OA

When you talk to authors, reviewers and editors, it is clear that most would like their work to be as widely read and cited as possible, i.e. they are supporters of the principle of OA. The recent position statement by the Association of Learned and Professional Society Publishers (ALPSP, at http://www.alpsp.org/news/openaccpositionstatementoct03.pdf) and the article on OA and *American Mineralogist* (next page) show that many publishers are supporters also. However, there is considerable concern that those driving the OA agenda are devaluing or ignoring the role played by publishers and taking into account the needs of authors and readers/libraries only. Publisher organizations such as ALPSP (www.alpsp.org) have devoted much time to numerous meetings and debates on the subject because of the threat to publishers.

What are the origins of OA?

The funders of research would argue that it is they who pay the wages of the researchers who write the papers, the referees who review the papers, and the editors who edit the journals, but they still end up having to pay to receive copies of the published research. This, coupled with the strong move over the last decade towards online publication of scientific journals, has led to the Open Access movement.

Some of the world's major funding agencies have made pronouncements on OA since the beginning of 2004. In the USA, the National Institutes of Health (NIH), with a $28 billion annual budget, implemented a new policy (http://grants.nih.gov/grants/guide/notice-files/NOT-OD-05-022.html) whereby it is requested that papers by all authors in receipt of NIH research funding be made available through an NIH-managed, free-to-all portal (*PubMed*). Of note, however, was the lack of any provision for paying the cost of publication. Later in 2004, the UK House of Commons appointed a Select Committee to examine the potential of Open Access. That committee's strong recommendation was that OA should be adopted, a recommendation which was firmly rejected by Parliament, the consensus being that the market should decide how best to proceed. The Wellcome Foundation in the UK (http://www.wellcome.ac.uk/doc_WTD002766.html) has also set out its stall, and from October 2005 all recipients of its grants will be required to deposit copies of their work in one or more OA resources. At present the Research Councils of the UK (RCUK) are debating their position on OA and in late June 2005 issued a position statement (www.rcuk.ac.uk/access/statement.pdf), which includes a requirement for all grants awarded from 1 October 2005 that 'subject to copyright and licensing arrangements, a copy of any resultant published journal articles or conference proceedings should be deposited in an appropriate e-print repository (either institutional or subject-based), wherever such a repository is available to the award-holder.' Interestingly, both the Wellcome and the RCUK statements mention that grants will, in future, include money to pay for 'cost-effective' publication. Not all funding agencies have yet established their positions with regard to OA, but there is no doubting which way the tide is running.

Who pays?

The mood, obvious from the tone of the documents indicated above, is clearly one which indicates that those organizations funding research, generally representing the taxpayers, require that the results of the work they support should be available to those taxpayers. It is not clear whether any funding will be made available to pay for the role played by publishers. What is crystal clear, however, is that without adequate funding, publishers will cease to exist, and this will result in an abrupt halt in the supply of scientific content for all purposes, including OA resources.

Publishers of journals have a number of fixed costs, including copy editing, typesetting, proof reading, printing, e-publishing, subscription fulfilment, mailing and storage. A simple calculation gives the cost of production of each paper. Some (particularly OA supporters) claim that this number is as low as $500. In my estimate, the cost is $1500–$3000 per paper. The lower costs are based on electronic publication only, whereas most journals still exist in paper form also. If publishers are to survive, then the cost of production of the scientific content in published form, whatever form that might be, must be met. Changing to electronic publication only would save 30–50% of publisher costs.

Who will pay the publishers? At present they are paid by the reader, through library and personal subscriptions. Open Access will turn this on its head. Publishers will now expect authors to pay enough money per paper to maintain their income levels. Authors may obtain this money from the funding body, e.g. RCUK, or from their institute or elsewhere. Will it be cheaper for an institute to pay publication charges suggested by publishers for all papers published by authors from a given institute than to simply pay subscriptions for the journals in which those papers are published? A study by Cornell University (http://dspace.library.cornell.edu/bitstream/1813/193/3/ OATF_Report_8-9.pdf) suggests that, in its case, it will not.

Will OA work?

Perhaps more importantly, will OA be more effective than the system we have now? Many means of providing OA are at an early stage of development, and only time will tell. The set-up costs are considerable, and undoubtedly many will fall by the wayside as shortcomings are exposed. As always, the best will survive. It may well transpire that publishers' journal sites are the best subject repositories. By and large, we know that these are well indexed already. Can we guarantee that the myriad repositories and other stores for scientific content will be sufficiently well indexed to ensure that a search of the Internet will find all relevant content? Indexing protocols have been established for OA content, and people establishing OA resources are encouraged to employ these protocols. Searching for scholarly content using facilities such as Google Scholar is not infallible. How can we avoid that age-old pitfall of failing to include discussion of key works because there was no hit in Google or it didn't appear in the first page or two of results?

What about authors who have no money to pay publication costs, particularly those in developing countries? These new policies will surely hit them hardest, and there is the obvious risk of financial elitism.

Summary

Is OA really the answer to the 'serials crisis'? Will readers with open access to all this extra material read more and cite more? If, between publishers and funders, a reasonable balance in the finances can be found, then, yes, OA is the answer and will be successful.

Publishers with a concern for less well-off colleagues will find ways to subsidize publication of their work.

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American Mineralogist and Open Access

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MSA has received inquiries about its policies on electronic open access and self-archiving of *American Mineralogist*. Open access means an article in a journal is made free to anyone from the moment it is published. Self-archiving means the article is posted and made available on another institution's website, presumably for free to anyone. It has been difficult to respond to these enquiries. There are significant financial and copyright implications related to both. The MSA Bylaws were written well before electronic publishing existed and do contain some specific statements about authors' rights. However, many aspects of open access and self-archiving are not well defined or standardized.

MSA recognizes three general aspects about open access, self-archiving, and electronic publishing. First, regardless of the terms used for possible new approaches to distributing scientific papers, it really boils down to who pays for the publishing—libraries, authors, government, advertising, foundations, members, a society, etc. Second, somebody will have to pay. Third, MSA cannot afford to pay if it does not charge for the journal.

MSA does have a situation different from most other Earth science societies at the moment. MSA makes the contents of *American Mineralogist* available free online after three years—a situation that some term an open archive. Any person can link to the online article on the MSA website, where the title, authors, and abstract are freely available as soon as posted. After three years the full text of the article is freely available.

Some revenue sources are more realistic than others in open-access and self-archiving models. Currently MSA uses a mix of library and member subscriptions and author page charges or offprint sales to support *American Mineralogist*. Open access would remove libraries from our mix. MSA cannot publish the journal on its own. Sufficient advertising revenue would be hard to come by. It is doubtful that any government will follow through with increased funding to support publications. It is unlikely that members would accept paying subscription rates of $200–$300 dollars for the journal. There appears to be only one source of income left. Essentially a switch to open access equates to a switch from a library subscription model to an author-pays model, if MSA is to continue to publish the journal.

What might the author costs be in an open-access, author-pays model? MSA's current voluntary "page charges" of $64 per page cover only the actual cost of printing and distributing a page of the journal. With open access, the content creation costs would also have to be covered. In addition to the printing and distribution costs, the costs of the manuscript review, editorial work, page layout, and administration of all these tasks would need to be covered. That cost is $225–$250 per page. Articles in the journal run from 10–15 pages, which means a total cost of $2,500–$3,750 per article. This is comparable to prices quoted for other author-pay, open-access publications. Some journals have lower fees because they do not produce a paper copy as well.

The open-access movement has not addressed the issue of publishing an article from an author who cannot afford to pay. MSA has no answer to this often-ignored shortcoming in the proposed open-access models.

Self-Archiving

A publishing society's response to open access is more straightforward than the questions posed by self-archiving. In the past, self-archiving would not have been any particular danger. It would have been very difficult to locate enough self-archived articles from *American Mineralogist* to form a replacement for a subscription to the journal. With today's search engines this is no longer true. I understand that Google Scholar will find all the locations of an article and indicate which ones require paid access and which ones provide free access. In a world where most of the content of the journal is self-archived, it is not hard to figure out which posting an economizing reader would use.

Any proper response to self-archiving requires knowing the underlying motivations for doing so. The usual reason hinted at for self-archiving is "free" access, but it does not apply here. In the case of MSA, where an author could pay for the costs of open access upon initial publishing and where there is free access after three years, why is self-archiving necessary? If there is still the desire for self-archiving, there must be other motivations. One questioner stated that their university could do a better job of archiving and promoting research published in *American Mineralogist* than could MSA. I find it hard to believe that a university would archive *American Mineralogist* articles of a long-gone graduate student better than MSA. In the US, I can easily envision the evolution of the thought by those who are financially responsible for the self-archiving units that they should be self-supporting or profit centers. In this case they would sell access, become the publishers, whereas societies would be review, editorial, and layout houses. These tasks left to the societies still require financial support.

New Policies

At its spring meeting, the MSA Council adopted two policies:

- MSA will provide open access to any article posted on the MSA website or on GeoScienceWorld for which an author pays the $250 per page creation cost. MSA will make it free upon the first day of publication. The author could link to this free-access article from any other site.
- MSA will provide a pdf file for self-archiving of any article for which an author pays the $250 per page creation cost. The organization should be encouraged to link to the article on the MSA site, rather than hosting the file themselves.

The US National Institutes of Health's (NIH) has a new policy on public access. It requests any author whose research received any direct support from NIH funding to submit their accepted, but not necessarily edited, manuscripts related to that research to PubMed Central, the digital library maintained by the National Library of Medicine (NLM) within 12 months of acceptance. PubMed Central will post the paper within 12 months of the final publication date. This new policy is voluntary. Although this new policy will only affect NIH-funded research, and very few MSA members or publications, it will probably influence the future of publication and dissemination practices for all federally funded scientists, publishers, and funding agencies. MSA added the following to the *American Mineralogist* and *Reviews in Mineralogy and Geochemistry* copyright assignment forms we ask authors to sign:

- "Journal acknowledges that Author retains the right to provide a copy of the final manuscript to NIH upon acceptance for Journal publication or thereafter, for public archiving in PubMed Central as soon as possible after publication by Journal."

Given the evolving nature of electronic publishing, these three new policies of MSA are unlikely to be the last words on the subject.

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The best OA repositories will survive, and many others, particularly institutional repositories, in my view, will fail. Online journals as we now know them will continue, supplemented rather than replaced by subject and personal archives.

As on many occasions in the last decade, publishers will find ways to make economies. The obvious one is to discontinue paper publishing, though whether or not we are ready to give up our paper journals is a tough question. Some readers would be more than happy to see them consigned to the great recycling bin in the sky; others would never look at your journal again.

It will be interesting to see the range of publication costs that will be set by publishers. Will those journals that currently charge astronomical subscription prices also demand astronomical publication charges? (Let's not forget about other vital elements here, e.g. impact factors.) And will authors continue to find ways to publish their papers in them rather than in our high-quality but cheaper, not-for-profit equivalents?

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