PERSPECTIVES

The Continued Movement for Open Access to Peer-Reviewed Literature

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• PURPOSE: To provide a current overview of the movement for open access to the peer review literature.
• DESIGN: Perspective.
• METHODS: Literature review of recent advances in the open access movement with a personal viewpoint of the nuances of the movement.
• RESULTS: The open access movement is complex, with many different constituents. The idealists for the open access movement are seeking open access to the literature but also to the data that constitute the research within the manuscript. The business model of the traditional subscription journal is being scrutinized in relation to the surge in the number of open access journals. Within this environment authors should beware predatory practices. More government and funding agencies are mandating open access to their funded research. This open access movement will continue to be disruptive until a business model ensures continuity of the scientific record. A flood of open access articles that might enrich, but also might pollute or confuse, the medical literature has altered the filtering mechanism provided by the traditional peer review system. At some point there may be a shake-out, with some literature being lost in cyberspace.
• CONCLUSIONS: The open access movement is maturing and must be embraced in some format. The challenge is to establish a sustainable financial business model that will permit the use of digital technology but yet not endanger the decades-old traditional publication model and peer review system. Authors seem to be slower in adopting open access than the idealists in the movement. (Am J Ophthalmol 2013;156:423–432.

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OPTIONS TO ACCESS THE PEER-REVIEWED LITERATURE

AT PRESENT, THERE ARE 3 MAJOR WAYS TO ACCESS the medical literature. Subscription-based journals still predominate, published by a wide range of commercial and not-for-profit publishers, including many medical societies that derive needed income from these endeavors to support their mission. The most prestigious journals covering large disciplines are published by this mechanism, but there are also some journals with very restricted readership. Individuals purchase a print subscription and most libraries have digital subscriptions; some libraries continue with print subscriptions as well, to a select (and shrinking) number of publications.

A second source to access peer review literature are the open access journals that turn the subscription-based model around and, instead of relying on subscription revenues from libraries or individuals, charge a fee to authors or funders before an article is published. For some open access journals these fees provide the sole mechanism to support the journal's production costs. Elsevier has about 40 journals that are total open access journals.[1] There are several variations of open access journals or articles that will be addressed below.

A third method of access is through repositories organized by many universities or in other established locations online, the most prominent being the National Institutes of Health (NIH)-sponsored PubMed Central. Repositories are not publishers but rather provide access to some version of the manuscript, either before or at some point after they have been published, usually subject to an embargo period. Universities in many countries have established their own repositories, but the rates at which published papers have been deposited in them so far have been very disappointing. Also, since these are only preprints or postprints the final published article in the journal might be slightly different from the article deposited in the repository, since the repository does not usually contain the journal-added formatted and copyedited version.

At present approximately 14% of the publications in medicine are available online free of charge from the onset of publication, and another 8% are available on a delayed embargo path to open access.[2] PubMed Central attracts 420 000 visitors per day, of which only a quarter originate

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from a university log-on; this confirms the high demand for scientific information outside academia.[3]

BACKGROUND OF THE OPEN ACCESS INITIATIVE

READERS OF A CERTAIN AGE WILL REMEMBER THE DAYS OF print-only publications and before PubMed, when clinicians and researchers had to explore the books of Index Medicus to hopefully find articles on a specific topic, usually finding only a title, or pay a fee to a reference librarian to perform this search.[4] Most articles were obtained by copying machines, with the tight binding of some journals precluding copying. Further possible references were noted within the articles and then the library process was repeated. As a result, many articles of interest were simply never located. Fast-forward to today's Internet search tools and the delivery of electronic tables of contents. Today you can search PubMed and PubMed Central from home, and most academics use their institutional software licensed from publishers to perform searches, frequently from home. Most articles can be downloaded as a PDF file or, using the HTML version online, there are ready links to the full text of the other articles cited using the CrossRef,[5] a collaborative reference linking service developed by publishers. The main task for readers or researchers today is to focus and manage the search terms, since there is usually an overabundance of articles.

This giant leap in the access to peer review literature took place for 2 essential reasons, the first the result of the traditional publishers' long history of the production, dissemination, and archiving of the huge volume of peer-reviewed scholarly articles and the second being the arrival of the Internet, permitting easy dissemination of this information. After decades of a successful publication process, the traditional subscription model of publishing research is now at a crucial and evolving stage. In this traditional system, the universities, research organizations, or clinical practices conduct the basic or clinical research; foundations or funding agencies provide funds to conduct research or authors simply provide their own resources; authors write research articles with no compensation for publication; publishers accept manuscripts on condition of copyright transfer and then facilitate the editorial process of peer review and manage the production and distribution processes needed for disseminating the articles; and libraries use institutional funds to purchase, organize, and preserve this scientific record and make it available for current and future researchers, or the individual clinicians purchase subscriptions to the journals.[6] Even researchers need to pay or have a personal or institutional subscription to obtain access to their own work. This system is mature but complex, interdependent, and perhaps now recognized by some as inequitable or unacceptable.

The new technology of the Internet has the potential to bestow worldwide electronic distribution of the peer-reviewed journal literature to all scientists, scholars, teachers, students, and public. Hence the movement for open access by users of the peer review literature, by librarians, and by the public was born and has now developed, although not gracefully. Traditional journals have only cautiously accepted digital technology to further enhance free access to journal content. Even though each of these processes can now be accomplished in a digital format alone, there are still significant costs to libraries and subscribers. Other features have emerged from the publishers, such as bundled journal digital subscriptions and enhanced content with new services derived from technology (eg, reference linking). Libraries initially had to have both print and online versions of journals, and pay for both. The bundled subscriptions offered were frequently inadequate, since many of the desired journals required additional fees. Although paper and postage costs were eliminated with digital subscriptions, they were replaced by costs to the publisher associated with online submission-and-review systems and hosting platforms. So, the digital availability did not appreciably reduce the cost of publication initially, and these cost issues have strained the previously cordial relationship between publishers and academic librarians.[7] Libraries' acquisition budgets for online access have not increased in parallel with the doubling of the budget of the National Institutes of Health (NIH) between 1997 and 2003 and of medical research worldwide.[8,9] In 2009, the STM (science-technical-medical) publishing market published nearly 1.5 million articles from over 25 000 unique titles, from over 2000 different publishers.[7] One solution is that libraries simply accept the reality of the explosion of medical information and either accommodate their budgets (unrealistic) or freely acknowledge their inability to provide all the literature to their constituents. Alternatively, coupling growth in research output to publication funding is a consideration, so that budgets and research outputs stay in tandem. But this only assists research-oriented institutions and alternatives are limited, especially in the United States.

A more contentious and volatile aspect of the open access issue is that, as Nosek and Bar-Anan describe,[10] many feel that the commercial publishers have exploited the researchers, reviewers, and editors who provide the content and perform peer review mostly on a voluntary basis, surrender copyright of the work to the publisher (who fails to publish the work quickly), and then turn around and charge the authors' universities (inflated) fees to access the content either in print or online. So the open access movement was driven in part by annoyance and frustrations at the real or perceived (excess) profit of commercial publishers who seem to be exploiting the academic community and the government or commercially funded research. In 2011, the biggest publisher in the STM field, Elsevier, made £768 million ($1.2 billion) on