

**FREE
KNOWLEDGE
CONFRONTING THE
COMMODIFICATION OF
HUMAN DISCOVERY**

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OPEN ACCESS TO SCHOLARLY KNOWLEDGE: THE NEW COMMONS

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An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.

—Budapest Open Access Initiative (BOAI), 2002

This is a vision of a knowledge commons, a common pool of all of the knowledge of humankind from which all can draw freely and to which all qualified scholars are welcome to contribute. This chapter highlights some of the history, successes, issues, current status, and future priorities for achieving a sustainable, global, open access (OA) knowledge commons.

Access Expansion from Print to Online Open Access

The expansion of access to knowledge made possible by the web is almost incomprehensible. The thesis provides an excellent example. Until recently, there would be a very limited number of print copies of a thesis, as little as one or two, and perhaps microfiche. Access was, of necessity, extremely limited. Even finding out about the existence of a thesis on a topic was limited to those with access to specialized tools such as the Dissertation Abstracts database; subscriptions to such tools are common only in research-intensive organizations. Even when the existence of a thesis was known, libraries were often reluctant to interlibrary loan theses, as the library typically only had one copy. The current trend is for theses to be made publicly available to anyone, anywhere over the Internet through institutional repositories. Access to theses has shifted dramatically in the past few years from extremely limited access to almost ubiquitous access.

In the mid-1990s, the United States National Institutes of Health (NIH) made PubMed available. PubMed is a freely available version of the United States National Library of Medicine's *Medline*, the world's premiere index to medical literature, previously available only through subscription.

The purpose of releasing *Medline* to the public was so that every doctor in the United States (and elsewhere) would have access. The NIH was astonished at the usage—a hundredfold increase. There were more PubMed users than doctors in the United States. Clearly, opening up access meant more than a few more readers. This expansion of access to a key resource preceded the move to evidence-based medicine, and, in the author's opinion, may be a causal factor.

The Open Access Movement

While open access is, by definition, online, an online journal per se is not necessarily open access. There are many online journals that are only available through subscription. For many scholars, this type of access may *look* very similar to open access. When the scholar's library has a subscription, users onsite are seamlessly connected to the journal, at no cost to the user. From home, all that is needed is to enter a username and password. It may not be obvious to scholars in the developed world that when others try to access the same content—whether colleagues in other universities and colleges, their own former students as alumni, scholars in the developing

world, professionals, patients, civil servants, journalists, and others—they are asked either to subscribe, at costs of hundreds or thousands of dollars per journal subscription for academic journals, or to pay to view each article at costs around \$30 per article.

The work of a scholar that is published in an open access journal is much more accessible than work that is published in an online subscription-based journal. While access to the scholarly literature is generally excellent at large research universities, not even the largest and best libraries can afford to subscribe to every journal. To illustrate the difference, let us look at the difference in access even to scholars at research universities between the open access *Journal of Medical Internet Research* and the subscription-based *Canadian Journal of Anesthesia*, which, like many subscription-based journals, provides free access to back issues after an embargo period. When an article is published in the fully open access *Journal of Medical Internet Research*, it is immediately available to anyone, anywhere. Articles are included in PubMedCentral (PMC), with links from the popular PubMed search service. The *Journal of Medical Internet Research* is listed in the *Directory of Open Access Journals (DOAJ)*; it costs nothing for libraries to add the journal to their title lists, so the *Journal of Medical Internet Research* will be found through most library journal lists.

At Harvard University Library and California State University Library, both the *Journal of Medical Internet Research* and the *Canadian Journal of Anesthesia* are listed in the e-journals collections. However, neither Harvard nor Cal State subscribes to the *Canadian Journal of Anesthesia*, so articles are only freely available after the embargo period. If one author publishes an article in the *Journal of Medical Internet Research*, it is immediately and freely available to scholars at Harvard and Cal State. If another author publishes an article in the *Canadian Journal of Anesthesia*, for the first couple of years after publication, scholars at Harvard and Cal State are told that the article is restricted and are invited to buy online access.

With this difference in access at some of the world's largest academic library collections, it is not hard to imagine the difference open access makes at smaller libraries and in the developing world. While there are good programs, such as the World Health Organization's HINARI Access to Research in Health Programme and OARE (Online Access to Research in the Environment), to increase access in the developing world to subscription-based journals, these are not equivalent to open access. For example, countries like India and China that should qualify for these programs on the basis of low gross domestic product are excluded because there are a few institutions that can afford subscriptions.

The progress of the open access movement around the globe is phenomenal. The movement for open access coalesced around three major international meetings that included a focus on defining open access. The resulting definition of open access is often called the BBB definition for the three meetings (Budapest, Bethesda, and Berlin). The Budapest Open Access Initiative (2002) offered up the following definition of open access:

By “open access” to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

The BBB definition has been an inspiration to the open access movement for many years. Recently, the author has come to view the definition as slightly flawed and a perceived rigid adherence to the technical element of the definition as problematic. I now use a brief, simpler definition of open access based on the one long posted by Peter Suber (n.d.) on his much-perused Open Access Overview: open access is scholarly literature that is digital, online, free of charge, and free of most copyright and licensing restrictions.

My reason for abandoning the BBB definition reflects to some extent a persistent confusion of this definition of open access with the Creative Commons—Attribution Only (CC-BY) licence. In spite of the superficial similarities of CC-BY and the BBB definition, there are some very important differences, and ongoing open access to scholarly works needs to happen in a real world where not everyone shares the noble goals expressed at the original BOAI meeting. Notably, none of the CC licences are restricted to works that are free of charge; the blanket commercial rights granted by the CC-BY licence could be giving license for downstream enclosure. If open access to the original works is not maintained, CC-BY could lead from open to toll access.

Tempting as the simplicity of equating open access with the CC-BY licence may be, in depth examination of what is really needed to achieve the BOAI vision is one of the important tasks for open access in the next few years. While re-use of materials such as graphs and charts is likely highly desirable

in many instances, blanket permission to change scholarly works (create derivatives as allowed by most CC licences) could be problematic in some areas. For example, in the medical literature small changes in wording, if used as the basis for patient treatment, could have major negative implications. Useful open sharing of research data likely depends more on format and standardization of metadata than on specific licensing issues.

Open Access Archives

While the terms “repository” or “institutional repository” are more common, the author prefers the term “open access archives” to highlight that the purpose of the archive is open access, and also to emphasize the archival or preservation function of these services. The Directory of Open Access Repositories (OpenDOAR) is a vetted list of open access archives, listing over 2,600 archives as of November 2014.

The world’s largest open access archive is PMC, with over 3.2 million items. The purpose of PMC is both access and preservation; PMC carries forward into the online environment the preservation function of the United States National Library of Medicine, which has long had a role in preserving the medical literature in paper format. Authors sometimes deposit articles; many of these authors are *required* to deposit in PMC by their research funders, a topic that will be covered later in this chapter. Many journals also deposit articles in PMC. Close to two thousand journals voluntarily contribute contents to PMC; over 1,350 of these journals make access through PMC free immediately on publication. Some journals will submit articles covered under open or public access policies on behalf of authors.

PMC is one example of a disciplinary or subject repository. The majority of repositories are not discipline-based but rather institutional in nature. One example is the Max Planck Society’s E-Doc Server, developed for Max Planck authors to self-archive research output, with over two hundred thousand open access items as of November 2014 according to OpenDOAR. Most university libraries host a repository for their institutions.

arXiv.org is one of the oldest, largest, and most heavily used of the open access archives. Developed in the 1990s by Paul Ginsparg, the arXiv self-archiving tradition flows naturally from a tradition of sharing preprints among physicists that predates the electronic environment. arXiv is hosted by Cornell University Library and has eighteen mirror sites around the world. In physics, arXiv is heavily used—hits of more than half a million

per day at the main site alone are not uncommon. While formal publication continues to be valued for formal certification, it tends to be arXiv that is read. Building on this tradition, the SCOAP³ Sponsoring Consortium for Open Access Publishing in Particle Physics has achieved the remarkable feat of switching all of high-energy physics publishing from a subscription to an open access basis, after forming a global consortium to coordinate the funding for OA publishing.

Open Access Journals

A fully open access journal is one that makes articles freely available from the moment of publication, in contrast with subscription-based journals that make articles freely available but only after a delay or embargo period. Open access journals, like subscription journals, vary in quality, age, discipline and region of origin, and business model. Some open access journals are new journals, while others have converted from a subscription model. There are open access journals with high impact factors. For example, several of the Public Library of Science journals are at or near the top ranking in their fields—very impressive, indeed, for relatively new journals. There are disciplinary differences in the trend toward open access, with relatively more open access journals in fields like genomics, but there are open access journals in every discipline.

As for a business model, it is important to emphasize that the vast majority of open access journals do not charge publication fees. As of May 2014, only 26 per cent of the journals listed in *DOAJ* had publication fees (Morrison, Salhab, Calvé-Genest, & Horava, in press). Indeed, publication charges are less common with open access journals than was the case with subscription journals (Kaufman-Wills Group, LLC, 2005; Suber & Sutton, 2007). Many open access journals rely on subsidies from their parent organizations. It is not uncommon, for example, for a society journal to rely on revenue from society members to subsidize a journal; this was often the case even with print journals.

The efficiencies of an online-only, open access journal make it much easier for a scholarly society to produce and disseminate an open access journal at minimal cost. Many academic libraries provide free or low-cost hosting and support services for journals that their faculty are involved with (Hahn, 2008).

Author's Rights and Self-Archiving

Traditionally, authors have transferred copyright to publishers, usually with a copyright transfer agreement. Copyright is not all-or-none, and in the electronic environment, it is increasingly common for authors to retain some of the copyright to their works. Many publishers are moving away from copyright transfer to a licence to publish. The licence to publish approach *tends* to leave more rights with authors, but this is not always the case. Currently, there is a wide variety of practices, ranging from full copyright transfer to authors transferring to publishers only the right to publish (or right of first publication) and retaining all other rights, to Creative Commons licensing.

It is important that authors retain rights to their work to allow for maximum dissemination through self-archiving, and also to allow authors to make full use of their own works. If an author has transferred full copyright to a publisher, it will not be legal for the author to post a copy on the author's website or distribute copies of the work to the author's own students without permission. Many publishers will not grant such permission without payment, even to the author of the work. Authors should consider the rights publishers expect even before submitting a paper, read the transfer agreement, and use an author's addendum to ensure retention of rights.

The SHERPA/ROMEO Publisher Copyright Policies and Self-Archiving provides brief summaries of the policies of the majority of publishers and journals, as well as links to the policies. This is a time of transition in this area for publishers, so authors should really read the publication agreement or licence to publish carefully before signing, or use an author's addendum to indicate the rights they wish to retain. There are a number of author's addenda available, including the Scholarly Publishing and Academic Resources Coalition (SPARC) and the SPARC Canadian Authors' Addendum, among others.

One of the reasons for retaining rights is to ensure maximum access to one's work by self-archiving a copy for open access. There is a substantial body of evidence demonstrating the open access impact advantage (Hitchcock, 2010). Another good reason is the strong preference by research funders for open access, increasingly expressed through open access policies.

Open Access Policies

The Registry of Open Access Repositories Mandatory Archiving Policies (ROARMAP) listed 503 mandates in total as of November 2014, up from 415

in November 2013. There are many more open access mandate policies in the works. There are two basic types of policies: institutional/funder or top-down policies and scholar-led permissions policies.

While the exact details of each policy varies, the basic idea of institutional or funder policies is that researchers funded or employed by the mandating body are required to make their work publicly or openly accessible, preferably immediately on publication, although most allow for some delay period if required by a publisher. Open access policies ideally require the researcher to deposit their own final manuscript into an open access archive. The deposit is usually required immediately, even if public access must be delayed.

The United States National Institutes of Health is the largest medical research funder in the world, and the largest funder to have implemented a public access policy. NIH-funded researchers are required to make their work publicly accessible in PMC, no more than twelve months after publication. The NIH Public Access Policy was among the first policies in the world. NIH learned a valuable lesson; the first form of the policy, which only requested, but did not require, public access, resulted in a dismal compliance rate of less than 4 per cent in the first year. In April of 2008, NIH implemented a much stronger policy, clearly requiring compliance.

All of the United Kingdom's Research Councils (RCUK) have some form of an open access policy. In 2013, the RCUK implemented a controversial open access policy strongly encouraging publication in open access journals with block funding provided to UK higher education institutions to pay article processing charges. In my submissions to the RCUK policy consultations, I have emphasized the distortion that this subsidy will cause in the market, one of the controversial aspects of this policy (Morrison, 2013).

The Harvard Faculty of Arts and Sciences' open access policy was a breakthrough, as it was the first policy initiated by faculty members. With the Harvard policy, faculty members grant to Harvard a nonexclusive licence to make their work open access through the Harvard open access repository (under development), "but not for a profit" (Mitchell, 2008). MIT's (2009) policy is the one I point to as a model, based on Harvard's but specifying open access. This is an improvement because "not for a profit" leaves the door open to charges for cost recovery.

To understand the commitment of research funding agencies to open access, it helps to look at the opposition, which has been substantial. Scholarly communication resembles a gift economy in some respects (e.g., neither authors nor peer reviewers are paid). At the same time, the highly lucrative science, technology, and medicine (STM) scholarly journal publishing market

is worth \$8 billion a year (Ware & Mabe, 2009). A few of the companies and the more profitable of the society publishers of this highly lucrative business have a history of actively lobbying against open access.

Lobbying efforts are aimed both at governments and at scholars, and sometimes take the form of deliberate deception. One notable example is the Association of American Publishers' hiring of Eric Dezenhall, known as the "Pit Bull of Public Relations," as reported by Jim Giles in *Nature* (2007). Giles reported that executives from Elsevier, Wiley, and the American Chemical Society met with Dezenhall, who subsequently sent some strategy suggestions to focus on simple messages such as "public access equals censorship" and "attempt to equate traditional publishing models with peer review." The Association of American Publishers confirmed the hiring of Dezenhall, and subsequent communications and lobbying efforts make it very clear that the publishing industry has followed Dezenhall's advice. It is obviously ludicrous to claim that public access equals censorship; this is probably not a tactic meant to withstand reflection, rather one designed to cause hesitation by someone with little time to consider the message. It is nonsense to claim that open access journals are not peer reviewed when there are thousands of peer-reviewed, fully open access journals included in the *DOAJ*, and even at the time, the journals of many of the anti-open-access lobbying companies provided options for authors to make their work open access. Peter Suber offered a thorough rebuttal to the argument that open access threatens peer review in the September 2007 *SPARC Open Access Newsletter*.

That so many open access policies have been, and are being, implemented in spite of this fierce opposition is one of the indications of the strength of the open access movement. Another is the phenomenal growth of open access resources. In addition to the over ten thousand journals, a *DOAJ* search includes over 1.7 million articles. The newer Directory of Open Access Books lists over 2,200 books from over seventy publishers and is growing at a rate of more than 40 per cent annually. The Bielefeld Academic Search Engine searches thousands of open access archives, containing more than sixty-four million documents, adding over fourteen million documents in 2014 alone (Morrison, 2014).

Conclusion

The Internet makes possible an unprecedented public good: open access to the world's scholarly knowledge, a commons where our collective knowledge

can be accessed by anyone, and to which any qualified scholar can contribute. In the period just over a decade since the first defining moment of open access in the Budapest Open Access Initiative, the growth of the global movement toward open access has been phenomenal. There are more than ten thousand fully open access journals, seventy publishers of open access scholarly monographs, and millions of documents available through thousands of repositories. The issues and challenges for the next few years for open access will be revisiting and refining the technical definition of open access and refreshing the vision of “sharing the learning of the rich with the poor and the poor with the rich.” Finding the means to sustain open access economically will be key to a stable open access scholarly publishing system; this is the main focus of my current research, *Sustaining the Knowledge Commons* (2014).

References

- Budapest Open Access Initiative (BOAI). (2002, February 14). Retrieved from <http://www.soros.org/openaccess/read.shtml>
- California State University Library website. Retrieved January 31, 2009, from <http://www.calstatela.edu/library/>
- Giles, J. (2007). PR’s “pit bull” takes on open access. *Nature*, 445, 25.
- Hahn, K. (2008). *Research library publishing services: New options for university publishing*. Washington, DC: Association of Research Libraries. Retrieved September 25, 2010, from <http://www.arl.org/sc/index.shtml>
- Harvard University Library website. Retrieved January 31, 2009, from <http://e-research.lib.harvard.edu/>
- Hitchcock, S. (2010). *The effect of open access and downloads (“hits”) on citation impact: A bibliography of studies*. Retrieved September 25, 2010, from <http://opcit.eprints.org/oacitation-biblio.html>
- Kaufman-Wills Group, LLC. (2005). *The facts about open access*. The Association of Learned and Professional Society Publishers. Retrieved September 25, 2010, from http://www.alpsp.org/ngen_public/article.asp?id=200&did=47&aid=270&st=&oaid=-1
- Massachusetts Institute of Technology (MIT). (2009). *MIT faculty open access policy*. Retrieved November 25, 2014, from <http://libraries.mit.edu/scholarly/mit-open-access/open-access-at-mit/mit-open-access-policy/>
- Max Planck Society E-Doc Server. Retrieved September 25, 2010, from <http://edoc.mpg.de/>
- Mitchell, R. (2008, February 14). Harvard to collect, disseminate scholarly articles for faculty. *Harvard University Gazette Online*. Retrieved from <http://news.harvard.edu/gazette/story/2008/02/harvard-to-collect-disseminate-scholarly-articles-for-faculty/>

- Morrison, H. (2013). Predicting increased costs and reduction in open access: Comments on the Research Councils UK revised OA policy and guidance. *The Imaginary Journal of Poetic Economics* (blog). Retrieved November 25, 2014, from <http://poeticeconomics.blogspot.ca/2013/03/predicting-increasing-costs-and.html>
- Morrison, H. (2014, October 1). Dramatic growth of open access: Some useful figures for open access week 2014. *The Imaginary Journal of Poetic Economics* (blog). Retrieved November 25, 2014, from <http://poeticeconomics.blogspot.ca/2014/10/dramatic-growth-of-open-access.html>
- Morrison, H., Salhab, J., Calvé-Genest, A., & Horava, T. (in press). *Open access article processing charges: DOAJ survey May 2014*. Retrieved November 25, 2014, from <http://sustainingknowledgecommons.files.wordpress.com/2014/10/oa-apcs-article-2014-october-171.pdf>
- OpenDOAR. Retrieved November 25, 2014, from <http://www.opendoar.org/>
- PubMedCentral. Retrieved from <http://www.pubmedcentral.nih.gov/>
- Registry of Open Access Repositories Mandatory Archiving Policies (ROARMAP). Retrieved September 25, 2010, from <http://www.eprints.org/openaccess/policysignup/>
- Research Councils UK. (2013). RCUK policy on open access and supporting guidance. Retrieved November 25, 2014, from <http://www.rcuk.ac.uk/RCUK-prod/assets/documents/documents/RCUKOpenAccessPolicy.pdf>
- Scholarly Publishing and Academic Resources Coalition (SPARC). *Author's rights*. Retrieved September 25, 2010, from <http://www.arl.org/sparc/author/addendum.shtml>
- SCOAP3—Sponsoring Consortium for Open Access Publishing in Particle Physics. Retrieved November 25, 2014, from <http://scoap3.org/>
- SHERPA/ROMEO Publisher Copyright Policies and Self-Archiving. Retrieved September 25, 2010, from <http://www.sherpa.ac.uk/romeo/>
- SPARC Canadian Authors' Addendum. Retrieved September 25, 2010, from <http://www.carl-abrc.ca/projects/author/author-e.html>
- Suber, P. (n.d.). Open access overview. Retrieved from <http://legacy.earlham.edu/~peters/fos/overview.htm>
- Suber, P. (2007, September). Will open access undermine peer review? *SPARC Open Access Newsletter*. Retrieved September 25, 2010, from <http://www.earlham.edu/~peters/fos/newsletter/09-02-07.htm#peerreview>
- Suber, P., & Sutton, C. (2007, November). Society publishers with open access journals. *SPARC Open Access Newsletter*. Retrieved September 25, 2010, from <http://www.earlham.edu/~peters/fos/newsletter/11-02-07.htm#list>
- Sustaining the Knowledge Commons* (blog). (2014). Retrieved November 25, 2014, from <http://sustainingknowledgecommons.org/>
- Ware, M., & Mabe, M. (2009). *The STM report: An overview of scientific and scholarly journal publishing*. Oxford, UK: STM: International Association of Scientific, Technical and Medical Publishers. Retrieved 2010 from <http://www.stm-assoc.org/document-library/>