

Open Access Publishing: An Examination of the Inevitable

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Abstract

The open access publishing (OAP) movement impacts the field of academic librarianship. This is a new and radically different business model for scholarly peer-reviewed publishing brought about by technological changes in the face of declining access to knowledge through escalating subscription costs and publisher restrictions on copyright and reuse.

This paper will examine recent historical events and the societal underpinnings of the OAP movement internationally, its current state and where it might be headed in the future. Institutional responses to government policies and new opportunities for librarians will be discussed. Open access (OA) publishing is not without its problems; these controversies will be examined as well.

## **Open Access Publishing: An Examination of the Inevitable**

For years the sector of the publishing industry that produced scholarly work in academic journals was very stable. The procedure for publishing an article was fairly consistent. The rise of the electronic document brought about revolutionary changes and the dust has still not settled down. Although online access to journals through both individual subscriptions and aggregated portals could have brought costs down and paved the way for wider access, the exact opposite has occurred.

### **Serials Spiral**

Publishers, correctly sensing that new technologies could seriously undercut the value of their industry, began to defend their products in a variety of ways. The result has been an unsustainable rise in individual journal prices as an ever-tightening “pricing spiral” leaving an increasingly “smaller group of customers” to “bear the publishing expenses of the journal” (Willinsky, 2006, p. 20).

This has caused “a pricing crisis for scholarly journals” (Suber, 2009, p. 29). Due to the structure of and reliance upon the publishing industry, libraries and academic institutions are somewhat beholden to the publishers of scholarly journals and have been compelled to pay “subscription prices that have risen significantly faster than inflation” (Suber, 2009, p. 29). A comparison to other sectors of the economy shows that “subscription prices have risen about twice as fast as the price of healthcare, for most people the very index of skyrocketing, unsustainable prices” (Suber, 2009, p. 29).

### **Bungled Bundles**

In addition to individual subscription costs that have increased to dizzying heights, publishers have also maximized their profits by bundling their subscriptions into databases. For

libraries this means that they are forced to pay for items that might not fit their needs. In multiple instances popular journals are bundled with ones that are not as widely read. Moreover, libraries are sometimes forced to purchase both the electronic and print versions of the same journal, which puts a strain on library budgets and shelf space.

One example from the literature shows that a scholarly society sold the exclusive rights to their popular publication to a large publishing firm (Farkas, 2010, para. 3). In the past this journal was indexed across the database platforms of multiple vendors. However, now this journal would only be fully available to the subscribers of two separate databases. In all the university that was given was an example would now have to pay close to \$7,000 for this one journal, “plus some other stuff we don’t want or need” (Farkas, 2010, para. 4).

It is like buying a bulk package of granola bars from Costco and realizing that you hate all of the flavors except for one. Suddenly it’s not a bargain at all. It has been compared to a buffet, where, although you can eat limitless quantities, you don’t want many of the items at all (St. Clair & Shorely, 2012). The strain of these expensive aggregated information sources often force libraries to make “the drastic step of leaving the all-you-can-eat buffet for the a la carte restaurant” (Business: Of goats and headaches, 2011, para. 5).

### **Restricted Rights**

Adding to the issue is the fact that many publishers are restricting copyright to their published version of the article. This meant that authors could not email it to other people nor could they post it on a web page. When work is reproduced electronically it is, in essence, republishing. In the past authors would have been restricted to purchasing reprints or making their own photocopies. The dissemination of these reprints, whether legally obtained or not, could not easily be discovered by the publisher. The advent of the World Wide Web and its use

as a vehicle of self-publication now made these copyright transgressions public and traceable. Seeing that articles in digital formats could be freely reproduced and distributed, some publishers began restricting access to the articles they published in their journals to paid subscribers only. In doing so they often deprived the author of any rights to reuse and disseminate their own work.

As a response, the Internet is filled with advice from scholarly institutions to researchers and writers on how to avoid signing away their rights. “A copyright is actually a bundle of rights. Traditionally all of them have been transferred to the publisher as a requirement for publication, but it doesn't have to be this way,” counsels Cornell University (2009, What authors can do, para. 3). SPARC reminds its members, “you need these rights” (2007, Understanding your rights, para. 4) while a libguide from Lehigh University points out “in today’s digital world, the right to disseminate and reuse the work is almost as important as the content itself” (2002, Background). A libguide on copyright from The University of Iowa advocates, “negotiating changes to these standard agreements” to “avoid unfortunate barriers to reuse and sharing” (2013, para. 1). A recently adopted OA policy issued by the academic senate at the University of California offers faculty “assistance” to “collectively reserve rights” that might be signed over to publishers, “often unnecessarily” (2013b, Preamble, para. 1).

There is an interesting historical analogy here between the current day and the publishing industry of fifteenth century England when “all the popular works...from Robin Hood to Greensleeves was taken into private monopoly ownership of the printed book guild...until perpetual copyright was finally outlawed in 1774” (St. Clair & Shorely, D., 2012). This knowledge is part of our scientific and cultural record. Moreover public monies often directly finance it. Both of these reasons support the existence of OAP.

Another, more contemporary parallel is found when considering the urban areas that once existed in the United States with “flourishing downtowns and ample public spaces where communities gathered and interacted” (Gurak, 1997, p.335). They have been replaced by “privately owned shopping malls...and this same shift can be seen in the trends involving copyrighted material especially material on the Internet” (p.335). The effect has caused a shift away from the public domain and towards “the permanent, licensed domains of the private sector, due to stricter interpretations of copy- right and fair use.” (p. 335).

### **No Compensation**

There is one more change that change occurred in the scholarly publishing industry. Peer reviewers and scholars who make up the editorial boards of these publications are generally asked to forgo compensation. As the co-editor of the *Journal of Academic Librarianship* points out stipends from scholarly societies for editorial work had previously been “a major selling point for membership to the association and had received regular funding from member dues” (Arant-Kaspar & vanDuinkerken, 2013 p. 21). The absurdity of the situation becomes apparent when applied to other information-based products such as video games or computer software. In an online review of the groundbreaking book “*The Access Principle*,” Aaronson asks the reader to consider the prospects of running a for-profit video game company entirely on volunteer labor (2006). After describing how every step of the publication and editorial chain in academic publishing involves free labor versus other knowledge products, it is pointed out that such a “request would anger everyone: conservatives and libertarians because of the unpaid labor, liberals because...the beneficiaries of that labor” (Aaronson, 2006, para. 8 ) are private corporations.

**Conclusion of discussion of crisis.** Suber comes to the conclusion that “we’re long past the era of damage control and into the era of damage” (2009, p. 29). Dismay over the loss of access to knowledge posed by the unsustainable price structure has fueled public outcry. There have been boycotts, criticisms, disparaging remarks and even anger (Arant-Kaspar, 2013, p. 20; Willinsky, 2006, p. 25). Some feel they have been the victims of “extortion” (Farkas, 2010, para. 5). Rubin notes that the “relationship between publishers and academic libraries has eroded” further prompting the need to seek out alternatives (2010, p. 210).

### OA Beginnings

In OAP an alternative to the traditional modus operandi of academic publishing has been found. It is difficult to pin point the exact time the movement started; one can end up researching the roots of OAP in the United States very far back. This assessment would have to include consideration of the effect of a funding environment that was in a growth cycle in the four decades following World War II (Willinsky, 2006, p.13-14). However, Willinsky notes “the year 2003 signaled a breakthrough...for what might be loosely termed the open access movement” (p. 1). The awareness is due in part to coverage by several top science journals and media outlets such as the *Wall Street Journal* on the launch of the Public Library of Science’s (PLoS) OA journal *PLoS Biology* (p. 1).

Although conceptualized years earlier, the OAP movement was “was first formally defined” by the Budapest Open Access Initiative (BOAI) in 2002 (Mounce, 2013, p.14). Considerable changes have occurred over the ensuing decade. The PLoS Initiative began in 2001 “has since transformed itself into an open access publisher that currently produces seven highly regarded OA journals” (Tomaszewski, Poulin & MacDonald, 2013, p. 61). For profit corporations such as the Hindawi Publishing Corporation have experienced exponential growth,

claiming “to have grown by 40-50% a year in the past four years, and aims to keep growing at this rate for the next four to five years” (Robinson, 2005, para. 1). Hindawi has also been an ISO certified company since 2010 and currently publishes more than 500 OA peer reviewed journals, (Hindawi, 2013, para. 1 & 4). Nevertheless, it has taken OA publishers awhile to be seen as legitimate vehicles for scholarly communications.

### **Beginnings of Government Action**

The 2005 National Institute of Health (NIH) Public Access Policy requested that NIH-funded researchers make their taxpayer-financed research available to the public within twelve months of publication. There was no requirement, nor were there any consequences for noncompliance. Although “lobbied into dilution,” the policy still signified “government acknowledgement” that “what has been changed by the new publishing medium is not only the public’s right, but public expectations around that right” (Willinsky, p. 3). Although the policy lacked teeth, it was a step in the right direction and gave the OAP movement a major boost.

In 2008 there was a presidential mandate to the NIH to freely disseminate scientific research that was funded by taxes. The resulting NIH policy “requires scientists to submit final peer-reviewed journal manuscripts that arise from NIH funds to the digital archive PubMed Central immediately upon acceptance for publication” (National Institute of Health, 2013, Overview, para. 1).

The National Science Foundation has also adopted OAP standards and has continued to refine these standards to ensure not only wide access but also to plan for access across the lifespan of the published research. In 2011 the NSF published an updated guide for the submission of grant requests that requires that “all proposals must describe plans for data

management and sharing of the products of research, or assert the absence of the need for such plans” (National Science Foundation, 2011b, p. 2). Also included are some statements about copyright that might raise some eyebrows or at least prompt a healthy discussion of the government’s long-term strategic plan for OA. In a section of the policy titled “Award & Administration Guide: Other Post Award Requirements and Considerations” it states that the “NSF may restrict or eliminate an awardee’s control of NSF-supported copyrightable material and of income earned from it, if NSF determines that this would best serve the purposes of a particular program or grant” (National Science Foundation, 2011a, D.2.a.ii). Although the policy does say that this will be in extraordinary situations, in light of the fact that there is currently an OAP bill in congress, now is a particularly suitable time to voice concerns.

### **Current Legislation**

Proposed by a bi-partisan committee, The Fair Access to Science and Technology Research act (FASTR) “would require government agencies with annual extramural research expenditures of more than \$100 million make electronic manuscripts of peer-reviewed journal articles based on their research freely available on the Internet within six months of publication in a peer-reviewed journal” (Schwartz, 2013, para. 1). According to Heather Joseph, executive director of the Scholarly Publishing and Academic Resources Coalition (SPARC), this legislation is significant because it stipulates that the publications are fully available as electronic documents which will allow “researchers, educators and entrepreneurs to analyze, text mine, and data mine these articles” which “will fully unlock their value” (Schwartz, 2013, para. 6). In an era of big data and meta-analyses this type of research is sought after as it often yields significant results. However, it needs to be noted that there is “no standardized bibliographic metadata” that currently identifies an article as OA and provides information regarding “what reuse rights might



be available to readers” (National Information Standards Organization, 2013, para. 1). Clearly there is work in these areas that still needs to be done.

### **Open Repositories: An Institutional Response**

The prospects for FASTR, the second such OA bill that has been proposed in recent years, are poor, with only a one to five percent chance of being enacted (Govtrack.us, 2013, Prognosis; Schwartz, 2013, para. 8). However many universities, scholarly societies and nonprofits are aware of its value and have begun their own repositories of research produced by their institutions. One that has garnered a lot of international attention is the University System in California. In July 2013 the university system for the Golden State adopted an OA policy “ensuring that future research articles authored by faculty... will be made available to the public at no charge.” (University of California, 2013a, para. 1). The policy encompasses ten campuses where 8,000 faculty members publish 40,000 scholarly works each year. (University of California, 2013a, para. 2). The policy aims to promote access to knowledge by having authors “grant a license to the University of California prior to any contractual agreement with publishers. (University of California, 2013a, para. 2).

The benefit is twofold; repositories such as these can “increase institutional visibility and prestige as well as access to scholarly knowledge” (Rubin, 2010, p. 211). This gives academic libraries “a particular cachet and identity and an alternative means of controlling and accessing content without the involvement of publishers” (p.239). The potential of institutional repositories “speaks well to how libraries’ role is changing in ways that gives credence to their playing a greater role in JSTOR-like projects” (Willinsky, 2006, p. 89). This is poised to change the nature of academic librarianship as “there is a felt redirection in the focus of academic librarianship, from pedagogical information seeking tasks towards a more active publication

support” (Hansson & Johannesson, 2013, p.232). Along with this comes “a regained prominence for new forms of bibliographical work” as “academic librarians have taken on a role not only as providers of information and documents, but as publishers in their own right” (Hansson & Johannesson, 2013 p. 232, 233). Academic librarians need to understand that this opportunity gives them the chance to “transform their role, not only within their parent institutions but also within the global information market from library to publisher” (Hu, Luo & Liu, 2013, p.111).

It is good that librarians seem to understand the need to take on a proactive role in the publishing paradigm since traditional collection management expectations might not always apply when working with new publishers. For example the director of business development for Hindawi states, in explaining his company’s focus on “author services,” states, “we were terrible at dealing with libraries” (Kho, 2010, “Customer,” para. 1). These statements point to trends that might suggest that new open access platforms might sidestep the library entirely.

In addition to government agencies and institutions of higher learning, several non-profit organizations are now requiring OAP for all research that they fund. The list includes AutismSpeaks.org, the Multiple Sclerosis Society, and The World Bank (Sherpa/Juliet, 2013). The academic online database J-stor was “founded in 1995 as an initiative of the Andrew W. Mellon foundation” (Willinsky, p. 8). However, “despite the potential value...it is unlikely that the current system of academic publishing...will disappear anytime soon” although it may “accomplish the goal of weakening the monopoly that scholarly publishers have over their customers” (Rubin, 2010, p. 211). It remains to be seen how this outcome will be influenced by widespread adoption of the OA model, the success rate of institutional repositories, legislative action, and the reputation of the individual publishing firms.

### **International Efforts and Progress**

Although the developing world should “no longer mourn the inaccessibility to research outcomes” (Nwagwu, 2013, p. 3), widespread OAP “is far from the reality yet” (Miguel, Gómez, Bueno-de-la-Fuente, 2013, p. 2). Moreover, “it is impossible to generalize” due to “levels of development which vary according to both the field and geography” (Miguel, et al, p. 1). In some regions the “situation seems to defy analysis” requiring a consideration of other factors like brain drain due to emigration or “chronic underdevelopment” (Nwagwu, 2013, p. 4).

Information infrastructure and government funding plays a key role in promoting OAP initiatives, databases, and publishing. A lack of it leaves it as “being a question of serendipity,” (Nwagwu, 2013, p. 3) when a region lacks even the ability to index its own material (Willinsky, 2006, p. 103). In more developed areas there is not only “the need for the number of archives to increase, but the contents of the archives need to grow fast as well” (Sawant, 2013, p.109). Other constraints are more universally felt such as the “challenges of technological obsolescence and a lack of structured collection and storage” (Hu, et al, 2013, p.111). In spite of its obvious benefits, OAP is far from ubiquitous; “recent international studies show that there is still a low proportion of articles freely available” (Miguel, et al, 2013, p.1) and African researchers note “the lack of awareness as being responsible for the low uptake of the OA movement...in the region” (Nwagwu, 2013 p. 3). Rubin quotes research that indicates a worldwide estimate of only 10% of authors publishing OAP (2010, p. 210). However, without bibliographic metadata standards, as well as a lack of reliable indexes in some areas, this becomes difficult to measure.

Across the globe coordinated efforts by libraries and institutions that receive government support seem to be working the best. In the Netherlands, the UKB academic library consortium has implemented a “special OA framework as part of the negotiations with all publishers” (Woutersen-Windhouver, 2013, p. 105). Currently 158 Sage journals give a 90% discount on

author fees to the “corresponding author employed at a Dutch university” within the consortium, which is comprised of thirteen university libraries and the National Library (Woutersen-Windhouwer, p.105). In Argentina the Ministry of Science and Technology has promoted the use of OA journals through the creation of a “national system of digital repositories and...government regulation” (Miguel, et al, 2013, p. 2). Accordingly, the number of Argentine titles in the DOAJ has grown 67% in the past five years and the country went from “two repositories in 2007 to 24 in 2012” (Miguel, et al, p.1). The “establishment of a national academic OA journal platform” for publishing is one “indication of the Chinese government’s attitude to support and promote OA in China” (Hu, et al, 2013, p. 110, 111). This support has led to the creation of “80 institutional repositories” and “related to this is a number of academic libraries that have developed integrated resource portals” that includes “efficient browsing and searching capabilities” of numerous OA journals (Hu, et al, p. 111). India enjoys a legacy of workshops whose main focus is “revolving around the implementation of repositories using open source software” (Sawant, 2013, p.108). In addition to a four-year increase in the number of OA repositories from 14 to 25 over the course of 2008-2012, India also has over 407 OA journals registered with the DOAJ (Sawant, p. 108, 109). These examples all illustrate how institutions can promote new publishing paradigms and, with government support, influence how scholarly works are disseminated. Countries that have garnered the support and attention of their government and university system are making the most strides towards providing full access to the scientific data and scholarly writings that their nations produce. For systems that are not as developed there is still a “mix of OA and bartered print copies [that] exemplifies the resourceful struggle” (Willinsky, 2006, p. 99)

### **An Open Access Critique**

Critics of the OAP movement are concerned about lowered editorial standards and are particularly wary of the number of OA journals that have started up in recent years. A spokesperson for Hindawi Publishing describes an early environment where publishers were split into two factions, those “with a long term vision...and those who were in it to make a quick buck” (Kho, 2010). These unproven newcomers represent risks on multiple fronts. Although the digital era contains the promise of a more level playing field, the inclusive nature of the OA movement raises the possibility that papers of dubious quality will be published and therefore accepted as scientific fact.

The naïve promise of the OAP movement is that the information that wants to be free can finally be that way. However, in many cases, the costs have simply been shifted to the writers through fees. Although it has been shown that “perceptions do not match reality” especially in as considered by rate of citation, the image of an OA journal as a vanity publication rather than “quality peer-reviewed research” persists (Tomaszewski, et al, 2013, p. 62). These author charges have proven to be very profitable; based on figures reported by the OA publishing corporation Hindawi it has been estimated that their profit margin is 52% while traditional scholarly publisher Elsevier’s was 36% (Beall, 2013a).

Some publication fees are not new. In the past scholars were often charged a typesetting fee if their manuscript included graphics or they might pay for reprints as reuse was generally limited to print copies. Some researchers have found that in the 1970’s “charges to authors represented approximately 20% of journal publishing revenue for learned societies” (2012. *Learned Publishing*, v. 25, no 2). So it is fair to say that fees were not entirely unheard of, however in 2013 they are often thousands of dollars.

It is also important to note that within certain segments of the for-profit OAP industry that there is acknowledgement that contributors should be courted for not only the content they provide but also the fees that they bring. For example, “Hindawi retooled its focus on who the paying customers were and designed its processes to serve them” (Kho, 2010). It has also been claimed that their business practices have “done away with the position of editor-in-chief” and instead “staffers in Cairo make accept/reject decisions based on reviewers’ comments” (Beall, 2013a). However, these claims have been refuted by evidence of the fact that every paper they publish includes the name of the editorial board member who oversaw its review. (Beall, 2013a).

Not all OAJ operate on a fee-based system. In 2012, according to a spokesperson for the Directory of Open access Journals (DOAJ), “only about 29% have publication fees” (Tomaszewski, et al, 2013, p. 63). While researchers frequently have access to funding to pay authorship fees and sometimes they are waived completely, the paying customer of the publication is now the writer. Some publishers offer membership plans where an institution or individual can cover all or part of the fees for a set length of time. (Springer Open, 2013). Some journals offer expedited peer review for a price (Beall, 2013c). One does not have to look too far to see a conflict of interest, although apologists abound. Recently, however, they were given reason to pause.

In a stunning piece of investigative work published in the peer-reviewed journal *Science*, writer John Bohannon exposed systemic failure throughout the OAP industry (2013). First he created a series of fake research papers by using software to generate “credible but mundane scientific paper(s),” but ones with “experiments ... so hopelessly flawed that the results are meaningless” (p. 62, 60). To ensure that this “scientific version of Mad Libs” was properly

riddled with errors, yet superficially plausible, Bohannon recruited molecular biologists from Harvard University to review the manuscripts prior to submission (p. 62). The general premise was that the fictitious researchers had discovered that a species of lichen contained a molecule that inhibited the growth of cancer (p.62).

Then he submitted these papers to 304 scholarly peer-reviewed journals. The list came from two sources, the well-respected Directory of Open Access Journals (DOAJ) and a “list that journals fear,” the website of “academic crime-fighting” library scientist Jeffery Beall (Bohannon, 2013 p. 62). About 20% of the publishers listed on Beall’s website have journals listed in the DOAJ (p.62).

Ultimately 157 papers were accepted. Bohannon writes that: “Acceptance was the norm, not the exception” (2013, p. 61). The papers cleared the peer review process at a wide range of journals including those associated with Elsevier, Wolters Kluwer, Sage, and Kobe University in Japan as well as those produced by scholarly societies (p.61). Journals that rejected the paper were associated with Hindawi Publishing (p. 65) and PLoS (p. 61). The author found that, “most reviews focused exclusively on the paper's layout, formatting, and language” even though “any reviewer with more than a high-school knowledge of chemistry and the ability to understand a basic data plot should have spotted the paper's short-comings immediately” (p. 64, 60).

Some critics say that there is even more to be concerned about than flawed data. From journal titles that “imitate and even “literally clone” those of more established ones (Bohannon, 2013, p.65) to those that publish research that was seemingly conducted using unlicensed software (Beall, 2013b), “inconsistent standards” are everywhere (Tomaszewski, et al, 2013, p. 63).

This is not some prank, like the one perpetrated by Alan Sokal, a physicist from NYU who managed to publish “a parody thick with gibberish” in a well-known journal in the field of cultural studies (Scott, 1996). Rather this is scientific research and as Bohannon’s experiment shows, it is happening on a widespread scale. If we agree that society should rely upon shared information resources to spark innovation, then it is imperative that the information we share has authoritative veracity. Sometimes this means being the contrarian. Otherwise we are building a body of work that may prove to be bunk.

### **Conclusion**

There is no doubt that OAP is here to stay. Subscription costs are unsustainable and sharing scientific information in a timely fashion makes sense on multiple levels. OA is more than just the “next step in a tradition that includes the printing press and the penny post, public libraries and public schools” (Willinsky, p. 30). It is also “holds the promise of moving knowledge from the closed cloisters” and “opens a new world of learning to those outside the academic realm” (p. 33). OAP is not without its flaws; formal OA standards are nonexistent and there is also great variation in quality. It seems to be generally believed that the industry is in a state of “flux” (Tomaszewski, et al, 2013, p. 65).

In some instances there is more to be concerned about than academic rigor being pushed to the sides in a wave of idealism, as several of Bohannon’s observations illustrate. It remains to be seen what the tradeoffs are. We are not there yet, nor will it resemble the idealistic dream, although it is a better than the previous system which has become unsustainable.

The situation can be viewed as cycling through the five stages of grief. Denial for many years while subscription costs rose, editors were increasingly forgoing compensation and authors



were not being paid either. Even worse the writers were compelled to give copyright to the publishers. This gave way to anger. Then bargaining in the form of hybrid solutions. There was more denial here too, as bargaining generally produces lofty goals and unsustainable idealism. Depression, in light of recent trouble with credibility has certainly been a setback. As the individual major issues get sorted out this continues as a cycle, moving through the first four stages and eking slowly towards the final stage, acceptance, when adoption is widespread and the use of clear standards apply.

Librarians, whose job it is to select sources of information, both in terms of databases and in terms of individual articles, need to be cognizant of this trend. The transparency of OA allows us glimpses into the editorial process and many of the clues that it can provide us in discerning the credibility of a resource. We cannot rely on established publishers or journal names that sound credible. It is important to always be aware that not everything in print is truthful, but currently the state of the OAP industry makes this type of critical thinking more important than ever before. On the whole, it is important to avoid replicating the high costs of the current system with a more crowd-sourced model that relies on individual article fees. The promise of OAP and the creation of institutional repositories also create new opportunities for librarians. It is vital to understand the ethical and technological framework that defines them.

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