REASON, RISK, AND REWARD: Models for Libraries and Other Stakeholders in an Evolving Scholarly Publishing Ecosystem

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Scholars have always sought ways to share their research with others and, especially, to register the priority of their discoveries against other potential claimants. Galileo famously encoded his discovery of the moons around Saturn and mailed it to Johannes Kepler, authorizing its publication only months later, when further observations had confirmed his findings and he feared that some other scientist might announce a similar, albeit belated, discovery (Wooten 2010, 120–22). Such publications came in the form of limited-circulation pamphlets at the time; the scientific journal per se did not begin until 1665, more than two centuries after the invention of the printing press. Significantly, this first true scholarly journal, the *Philosophical Transactions of the Royal Society*, also began the evolution of peer review; its first editor, Henry Oldenberg, initiated the practice of sending submitted manuscripts, which often took the form of letters, to other scholars for comment before he published them (Hall 2002, 153).

Much has changed in the 450 years since the founding of *Philosophical Transactions*. Throughout the world, the publishing of scholarly articles today is a multibillion-dollar industry. But it is also an industry in the midst of huge transitions, mostly brought about by the rapid development of digital communications technology. The underlying technology of scholarly publishing remained relatively stable for four centuries, but it has undergone radical change in the Internet era of the past three decades. Clay Shirky (2012), a well-known writer, teacher, and

consultant in matters of the Internet, once said that "[publishing] is not a job anymore. [It's] a *button*." The remainder of the interview makes clear that Shirky is speaking of publishing as the process of disseminating works of the intellect; he goes on to say that parts of what we now consider the publishing enterprise, such as editing, fact-checking, and design, are still needed. And, as the examples from the early history of scientific publishing have shown us, other functions remain important to scholars regardless of the medium by which their works are disseminated, such as the registration of priority and peer evaluation.

Shirky's comments point us toward a consideration of the various facets of the process we call publishing. Traditionally, publishers of academic journals and monographs have performed at least these functions—filtration (the selection of works that merit greater attention, and perhaps more important, saving readers time that might be wasted on those that don't), registration (staking out the priority of an author to a particular set of ideas and expression), validation (the peer-review process, intended to establish that a work is not just interesting but also intellectually or scientifically sound), editing, dissemination, and marketing. Some of these functions have become much easier in an age of instantaneous digital communications—this is Shirky's point about dissemination. In an environment where mass distribution really does require not much more than the click of a button, the dissemination aspect of traditional publishing takes on less importance relative to other parts of the process. Likewise, it is much less necessary to have an organization that can identify and reach selected markets when it is possible to reach much larger groups with much less effort. The other four facets we have identified, however—filtration, registration, validation, and editing—still seem necessary to maintain both the standards of scholarship and, frankly, the promotion and tenure system that relies on it.

This mention of promotion and tenure also serves as a reminder of another function that academic publishers have traditionally provided, which we could call branding. That is, the name and reputation of specific journals and specific publishers carry significant implications that the scholarly community relies on. Evaluations of the quality of a particular scholar's work often begin, and sometimes end, by noting the reputation of the journal or the publisher through whom it was distributed. The development of an industry around impact factors is an acknowledgment of the importance of this aspect of the publishing industry, but it also calls into question how effectively such branding actually serves as a surrogate for quality.[1]

The obvious implication of this brief analysis is that we need to think about the different facets of the publishing process separately, both in terms of the degree to which they are still needed and in terms of how they can most effectively be accomplished where they are still necessary. In other words, we need to consider unbundling the publishing process and thinking creatively about each of its aspects.[2] It is to that task that we now turn.

UNBUNDLING THE PUBLICATION PROCESS

Because all the functions of scholarly publication are joined, in traditional models, into a single process, the financial support for the whole operation (including many subsidiary or tangential activities) depends on a single transaction that happens only at the end of the process—a subscription payment or a sale. Such transactions are only possible, of course, if the final product can be withheld from a consumer unless payment is made. In the age when journals were published only in print, this exclusivity or scarcity was essentially a technological necessity, enforced by the legal regime of copyright, which is a limited and state-created monopoly. As publishing moves online, the technological reasons for scarcity have vanished, and copyright by itself constitutes an increasingly tenuous way of exclusively controlling academic work.

The possibilities and economics of online publishing have made it unnecessary—and perhaps even undesirable—for all the functions required to create a journal to be bundled together, and for funding of the whole process to depend on only one source. If the cost of making available ten thousand copies only marginally differs from the cost of making one copy, and the bulk of the cost— research, writing, editing, filtering, branding, and so on—lies in the creation of that first copy, how might we change the funding model so that the focus is on how best to meet those costs, rather than on dissemination being a cost barrier at the end of the chain?

This question does not apply, of course, if the primary goal of authorship and publishing is to maximize the economic value of the work as a commercial product, where that value is primarily indicated by how many people are willing to pay to get it, and how much they're willing to pay—in other words, to earn royalties or other payments that depend on sales counts. But since academic authors make little or no money from journal articles and monographs that they write, it is clear that there are other motives to write and publish research.

If the primary goal of academic authors is to have their work disseminated as widely as possible—read by the largest possible audience who might learn from

their insights and benefit from their work—and to build reputation, influence policy, or stimulate further discussion, then the toll barrier that limits potential readership becomes counterproductive.

Here it might be useful to make a quick aside to address the question of whether "information wants to be free," as this is a straw man often raised to denigrate as naive those who argue for changes in models of scholarly publishing. Clearly, there are costs associated with every step of the research and publishing process, so it's not free in the sense that no one will ever have to pay. Some of these steps can be made more efficient—in quite significant ways—by new technologies or processes, and costs can be dramatically reduced. For other steps there are few efficiencies to be gained, or costs might increase to cover new services such as enhanced linking and indexing, encoding for multiple reading platforms, or other tasks unnecessary in the print world. The more salient question is: Who bears the costs? And are they in a position to manage those costs, to decide the relative value of different aspects of the process, and to compensate for them commensurate to the value they provide?

The answer to this question is that universities typically cover all the costs of the scholarly publishing process, usually through their library and research budgets, but that the practice of bundling—both of a variety of publishing-related services and of a variety of publication products—hides the true costs of any particular part of the system. All we know is that if universities fail to continue to pay what is being asked, the final product, which is essential both to academic authors and to the community of readers, will be withheld.

There is a very strong incentive to keep things bundled—the major players have invested heavily in the current system, and the sustainability of their business models and profit levels rely on preventing disruptive changes. Similarly, many authors and readers, at least at research universities who have invested significant sums in both producing scholarship and purchasing access to it through their libraries, are fairly well served by the current model. The potential benefits of a more open and disaggregated model are becoming obvious only slowly to many researchers and authors, and university systems that have been developed over time around the older model further obscure the value of change. It's difficult to imagine a different model because we are so reliant on the present one, and because the present one has been resistant to change for a wide variety of reasons. Almost everyone in the system benefits in some way from it, and fears potential disruptions.

It is true that professionally run publishing services can be expensive. Large publishers have built significant added-value services that benefit from aggregation. We should not underestimate the value of the work they've done to set and maintain quality standards, to layer useful tools over online articles, to make the tools consistent across large bodies of work, and to integrate them into broader standards-based systems that make them searchable in library and commercial indexes.

Yet it's not clear that the current major players are necessarily those who might provide these services best. Right now, they are the only ones able to provide these kinds of services because they have monopoly control over the core content—the articles themselves—through the copyright transfer agreements that authors typically make before publication. They in turn might contract with or authorize third parties to provide services around "their" content, but in general, they tend to keep a tight grip on it and allow only uses that support their own interests in preserving the financial viability of their business models.

The vertical integration of scholarly publishing—putting ownership of all aspects of the process in a single organization—has led to efficiencies, but it has also conferred monopoly powers, and monopoly powers have many undesirable side effects, of course. Among these are the ability to avoid or stifle competition, and with it the ability to set prices at a level higher than the product or service merits.

Ultimately, the issue is one of control. Academic authors, in exchange for the bundle of services a journal provides, typically sign contracts with their publishers that give the latter ownership and control over their work and of the terms under which it may be used in the future. This may seem like a fair trade because of the benefits an author obtains by having his or her work featured in a particular journal. But it forecloses a number of options the author might otherwise have wanted to keep, limits the potential for the work to be available to a much broader audience, and in any case, is unnecessary.

Let's imagine a model where we still expect that each of the services scholarly journals currently provide are still desirable and provided, though not necessarily by the same entity or through the same bundled process. Let's suppose authors kept ownership and control over their own work, rather than giving it away to a single organization, and instead granted the ability for any number of service providers (including, but not limited to, their current preferred publishers) to use their work in a broad range of ways (such as through a Creative Commons Attribution license). What might be gained?

One advantage might be the possibility for more competition; lower economic barriers to entry would mean that if several different providers are able to offer similar services, authors, readers, and the universities or other agencies that pay the costs would be able to choose the ones that provide the most value for the least cost. Also, a greater degree of experimentation might be possible, because different experiments could be tried on different facets of the process without putting the whole enterprise at risk. Innovation might likewise increase due to the greater flexibility that would come from freeing scholarly materials from monopoly control.

This is not just a fanciful idea. It is, essentially, what has happened in the software world, with the rise to prominence of open-source software since the mid-1990s. The World Wide Web, and many of the systems that make the Internet work, are based on code released with open licenses, and the openness of the code, and ability to build on top of it without asking anyone's permission, has been one of the principal engines supporting the growth of a broad variety of innovative Internet services. It has not, of course, led to the collapse of big players like Microsoft or Apple, but has enabled a flourishing ecosystem of small players who can innovate, experiment, and take risks in ways that the larger players can't or won't. And when they do succeed, much of the ecosystem can benefit from the new services, learn from them, and potentially compete with and improve on them.

There are, of course, risks in this kind of scenario. Small, fast-moving startup businesses usually have a narrow focus, and while they might meet some specific needs better than big players, they are unlikely to be able to meet all needs. Big, disruptive changes that come as a result of innovations by new players can also result in the loss of things we truly value because they can no longer compete.

Some other potential risks that might arise from a more competitive scholarly publishing ecosystem:

- Attrition of service providers. Small new players will not necessarily have the stability or staying power to sustain even positive contributions. The failure of service providers might leave gaps, though if the services they provided were truly valuable, and ownership of the core materials were not bound to the one provider, the valuable aspects are likely to be picked up and provided by other players.
- Established and trusted brands might be diluted. New players might provide valuable services, but without an established reputation, it will be

difficult to make shorthand assessments of their value. At the same time, brands that have been known and trusted for some time, and that were shorthand for quality, might lose that sheen, without something as big and obvious replacing it.

• More uncertainty about how to interpret different indicators of value and quality. As bad as the current indicators (such as h-index or acceptance and rejection rates) are, they are commonly understood, as are their limitations. With new indicators, there are dangers around ignoring their potential but also in overstating their value.

• Potentially more complicated funding models. The current model relies on relatively simple transactions of buying and selling products, with a relatively small number of buyers (libraries) and sellers (publishers) with long-established and well-understood practices. Opening up the market to a variety of new players and paying for a variety of unbundled services rather than comprehensive products introduces the potential for a number of new and different transactions that might be difficult to explain and justify to funders. Given that the end product might be free to access, and that the services that created it are what we'd be paying for, it also changes the nature of the transaction and requires new models of showing value and determining appropriate levels with which to compensate for it.

The potential benefits of a changed model for scholarly publishing are compelling. The potential risks are serious, though in a situation where the most essential components of the ecosystem—the articles themselves—are unfettered by restrictive licensing schemes or technological barriers, the opportunity to have new or established actors step up to address the risk is greater than in the current situation, where only a small number of entities control so much of the ecosystem. The ecosystem metaphor is not incidental—if we think about scholarly publishing in ecological terms, we can think of a movement from a monoculture (of a small number of big publishers with a sustainability model built on a particular business model) toward a greater variety of interconnected smaller players—each of whom might be more vulnerable in small ways, but the loss of any being less likely to upset the whole system.

And this brings us to a discussion of another major player in this ecosystem that we have not yet addressed—a set of organizations that are mission driven, rather than market driven; that are widely distributed and independently oper-

ated, and therefore less vulnerable to single points of failure, and that were designed to be stable over long periods of time; that are catholic in their scope, strong supporters of intellectual freedom, and opponents of censorship and other restrictions on access to knowledge; and that are in full alignment with the mission of learning, teaching, and research that constitutes the primary reason why authors write academic articles. We are, of course, talking about libraries.

THE ROLE OF LIBRARIES IN ACADEMIC PUBLISHING

Academic libraries have always played a significant role in the system of scholarly communication. It is part of the core mission of such libraries to provide the resources necessary for teaching, learning, and research on campus to flourish. The role of academic libraries has never been entirely restricted to simply purchasing the resources used to create new knowledge. Rather, the role of libraries has included the collection of both commercially available resources and unique materials, through so-called special collections, the description and organization of resources for easier location, and instruction in the use of various types of materials, especially so that students learn the canons and criteria of good research. These large roles will persist even as the technological and economic models for scholarly publishing change, while new roles may also be assumed by library staff.

Because libraries have always had a role in the academic publishing ecosystem—both in supporting research that leads to articles and books and in providing those (and other) resources to serve as inputs for the next stage of knowledge production in a given field—it is perfectly logical for libraries to embrace and take leadership in the movement toward more open access. Open access, including a variety of new ways to present and disseminate the results of research, has become a part of the scholarly communications landscape, and it would be a failure of their core mission if libraries were not active in this space. As that landscape shifts, it is vital that libraries play a role in the changes because they have a rare opportunity to gain more control over the way research is disseminated and, therefore, over the ways they spend the money entrusted to them to act on behalf of the researchers and academic communities they serve. The best means, after all, for avoiding an unpleasant future is to take an active role in crafting the transition. Libraries simply do not have the option to ignore new models of publishing if they wish to continue to pursue their basic, long-standing mission in this new environment.

What is new, and exciting, for academic libraries, is the opportunity to be more deeply involved in the research and publication process. Instead of being confined to the two ends of that process—the provision of inputs for research and the purchase of outputs—libraries are now looking at the different aspects of the whole process and seeking places where they can help. One activity that is rapidly gaining great importance, for example, is digital curation—assisting with the planning, management, and preservation of scholarly materials that are not traditional publications: data sets, digital projects, informal writings in venues like blogs, and course materials. When we look at the publication process, and consider the disaggregation of functions already discussed here, several new opportunities for libraries emerge, as well as needs that they can fulfill.

The types of publication that academic libraries primarily seek deeper involvement with are usually open-access models. There are both practical and mission-based reasons for this. On the mission side of the value equation, libraries recognize that great accessibility is a better return on investment than limited access. Since part of the mission of most libraries is to make resources available to those who need them, the potential that scholarly works supported by libraries will reach unexpected audiences or readers who will themselves use those works to foster new knowledge and creative projects represents increased value. More practically, the technological infrastructure libraries already have in place really is designed for maximum openness. Restrictions are costly in the digital age; it is easier and cheaper to make digital scholarship open, and the capacity for restricted access that libraries do have—an authentication system for faculty and students that is necessary to keep access to commercial products we license closed to the public—is not very granular and difficult to extend to external populations. So imposing subscription-access barriers would be both unnecessarily expensive and contrary to the basic calling of libraries.

The involvement of academic libraries in the publishing process, broadly defined, focuses on three types of open-accessing publishing that, using distinctions now widely accepted, can be called green, gold, and pure gold roads to open access. At a basic level, we can observe that green open access, defined as authors making openly available some version—usually the final, post–peer review manuscript—of an article in a disciplinary or institutional repository, is a very easy step for academic libraries. In many cases those libraries already have the necessary infrastructure in place because of projects involving theses and dissertations or the digitization of unique materials from library special collections. In other cases, already existing consortia of libraries can pool resources to deploy

repository software for their members to use. When libraries offer to extend these repositories to faculty for scholarly articles they have authored, the principle cost resides in the time it takes the staff to communicate a process to faculty authors and to assist them in navigating the complexities of the various publication agreements they have signed.

In green open access, the various facets of the publication process that we have discussed essentially remain bundled together in the hands of traditional publishers. The provision of a green self-archiving option simply adds an additional layer to the dissemination and market services; in addition to making the work available to subscribers, it will become available to a much larger audience and discoverable through some additional channels. Registration and branding still occur under the auspices of a publishing house, and the peer review remains unchanged from the process followed by traditional articles that are not self-archived. It is because these functions remain bundled and external to the campus that this option is so lightweight for academic libraries, but it does have a significant drawback. The costs associated with publication remain undifferentiated and largely invisible with green open access; neither the libraries nor the authors gain any control over cost with this model (in fact, there is an additional modest cost to provide this access, but it is justified by the significant increase in access to broader audiences). But as we have seen, greater awareness of costs and some level of control may be essential to really transform the scholarly communications ecosystem.

The situation is slightly improved with that form of gold open access that requires the payment of article-processing charges (APCs)—which in effect means paying up front for a set of services that result in a freely available journal product. But that model raises other concerns that cause academic libraries to proceed cautiously in this space. A significant number of academic libraries have established funds, sometimes called COPE funds, for Compact for Open-access Publishing Equity,[3] that are used to pay or reimburse author-side article processing fees in whole or in part. This form of support for open-access publishing also leaves all the facets of the process bundled together, and existing journal brands and delivery mechanisms remain intact, just without subscription barriers to access. However, APCs vary quite dramatically, from as low as $800 per article for some Hindawi published journals,[4] to $5,000 per article for publication in *Cell Reports*, an open-access journal from Cell Press.[5] So it is difficult to be confident about the relationship between these fees and the actual costs of publication, and those costs

remain as much beyond the control of those paying the APCs as traditional journal costs are outside the control of subscribers.

This uncertainty about APCs is also a reason for concern to those libraries that support this type of publishing model. A fundamental question remains about the sustainability of the open-access business model based on APCs. As commercial publishers with, presumably, higher overhead costs, move into open-access publishing, we are seeing APCs begin to rise. Libraries have an obligation to ask themselves if this model is any more sustainable that the subscription model has become; how high can APCs go before authors object, and what limits should libraries place on the expenditure of their limited COPE funds? Many publishers of APC-supported journals assume that most authors will use grant funds to pay the fees and that those without grants will receive assistance from the institutions. But grant-funded researchers are often loath to spend limited funds on APCs, and steady increases will make that reluctance much stronger. On the other hand, COPE funds are (at this point) usually quite limited and cannot support the level that some fees are reaching.

One potential factor in the level of APCs is the emergence of non-profit open-access journals such as PLOS (Public Library of Science), eLife, and Elementa, which were started by academics to promote more openness and lower costs for scholarly publishing. While many gold journals are part of profit-making companies, whose goal is presumably to seek the highest fees that the market will bear, these more mission-driven publishers are likelier to seek the lowest cost that will enable them to meet their goals.

Another wrinkle in the author-pays model of open-access publishing is the so-called hybrid journal, which publishes most articles in a traditional subscription format but offers authors an option to "bail out" a specific article by paying an author-side APC. Libraries that administer COPE funds often decline to support this type of fee because they are usually already paying for a subscription, and these one-off APCs seem like double-dipping. There is little evidence that these fees actually reduce the subscription costs to libraries or to individuals, or that the articles themselves, open but hidden among many closed articles in a journal otherwise available only by subscription, can be found by a significantly larger set of readers. Thus the relationship between APCs and the actual cost of the publication process versus the potential benefit achieved is even more obscure for this type of open access, and the incentive for libraries to support it is negligible.

The most common form of gold open access supported by libraries (and that is part of the open-access landscape in general) is what we call "pure gold"—

where there is neither a subscription fee nor an APC, and all articles are available to anyone with an Internet connection. The organization that developed the most commonly used software platform for publishing such journals—the Open Journal Systems (OJS) from the Public Knowledge Project—reports that more than twenty thousand journals are being published using that platform. It is safe to assume that some portion of those journals is published with the support of academic libraries.[6] Often these journals are modest publications that serve academic niches and would not be considered profitable if offered to large academic publishers or even university presses. Thus this is an opportunity for libraries to support open access in a way that uniquely serves scholars and broadens the audience for journals that might otherwise struggle to reach their readers.

It is more unusual, perhaps unique, for an academic library to take on publication aspects of a major journal with an established reputation after years of traditional publication, as is happening in the case of the Duke University Libraries and *Cultural Anthropology*. In this case, the libraries provide technological support—both infrastructure and some defined amount of staff effort—so that *Cultural Anthropology* can use the Duke installation of OJS for article submission, editorial functions, and archiving. This is a relatively low-cost way for the Duke University Libraries to support a potentially groundbreaking experiment while both serving its own mission and helping the journal better serve its own. The need for *Cultural Anthropology* to reach the diverse audiences for whom it is intended correlates well with the libraries' commitment to improving our services even for unexpected readers.

With this experiment we begin to see a more robust example of the disaggregation of functions we have been discussing. Selection and editorial functions continue to reside with the scholars who volunteer their efforts to produce *Cultural Anthropology*, but they are separated from the branding of a commercial publishing house and from the platform by which initial dissemination occurs. Of course, because *Cultural Anthropology* is a well-established and respected journal, it can stand on its own as a brand, and the registration and certification functions for articles are not impaired by its independence. Thus the transition to open access is facilitated by the reputation the journal has developed, as well as by support from the American Anthropological Association (AAA) and the Society for Cultural Anthropology. *Cultural Anthropology* will of course now face the challenge of finding sources of funding other than subscription revenue to continue the operations of the journal, and it will need its community to make the transition along the AAA path of thinking of the journal as a service the society provides rather

than as a product it sells. From the libraries' perspective, this is a rare opportunity to support a high-profile transition to open access and to assist with controlling the costs of producing the journal, which remains perhaps the biggest issue for open-access publishing.

FINANCIAL TRANSITIONS

For libraries, the questions about how they spend their money and the value they get for the investment that academic institutions make in library collections and services are paramount. So the fundamental question that must underlie these efforts to support new forms of publishing and scholarly communications in academic libraries is how they are going to be paid for.

Initially, many academic libraries made small steps toward supporting open access. These first steps included improving the technological infrastructure for digital dissemination. Even at institutions where the library does not maintain that infrastructure, the need for these improvements has become obvious. Libraries also began to task staff with paying attention to new forms of scholarly communications and to seek out efforts that libraries could support. For many libraries, these undertakings resulted in embryonic repositories, often focusing on theses and dissertations, working papers, research reports, and other kinds of so-called gray literature. Modest as these efforts were, they represented the beginning of investment in open access and created a technical and human foundation for more robust initiatives.

As this movement developed, the next stage meant some new hiring in libraries. Many academic libraries began to add positions that would not have been necessary before the birth of digital scholarship. There was and continues to be an interest in hiring copyright specialists, sometimes attorneys and sometimes experienced non-lawyers, to address the growing need to manage legal issues that arise around digital production, dissemination, and curation. As repositories have increased their profile, it is now common for libraries to have full-time repository managers. This is a Janus-faced role, requiring both technical expertise and the ability to relate well with faculty authors. Finally, many libraries are adding staff to support digital scholarship, a position that requires a similar set of differentiated skills. While many of these positions have been created by repurposing vacant jobs within the libraries, they represent a growing commitment to spending money to support important changes in scholarly publishing.

This new hiring essentially indicates new positions needed in order to support an older mission. The transition to support digital scholarship, open access,

and library publishing is simply the current mode with which libraries are adapting their mission to support teaching, learning, and research to the digital age.

For the libraries that have created them, the COPE funds that support author-pays gold open access have been the most noticeable change, if not the most significant one. That is because they have required either the redirection of budgeted funds or new sources of funding. Many libraries have taken COPE money from their collection budgets, while others have combined several sources, usually including at least some collection dollars. At a few institutions, new money for this purpose has been provided from academic and research entities other than the library.

With these COPE monies the most vexing question about funding for open access and library publishing comes in to play. How can we transition the millions of dollars that large academic libraries spend on the purchase of toll-access materials to support for the production of open-access scholarship? Can we imagine a future in which far less money is dedicated to buying access to commercially produced resources and more—much more—is spent to support the creation and dissemination of scholarship accessible to all? Three points about this process are important:

- There is lots of money in the system to fund this transition. The 125 large research libraries that make up the Association of Research Libraries spend more than $1.4 billion dollars on materials; the total for all academic libraries is naturally much more than that.[7] So if a large-scale transition could be accomplished, there would be plenty of money with which to support non-profit presses, scholarly societies, library publishing operations, and other new services to support scholarship and scholarly publishing that have yet to emerge.
- Open access envisioned this way—as multiple efforts undertaken by many different groups and supported by repurposed collection funding—would almost certainly be less expensive than the current system, where a large portion of the expenditures go to purchase journal packages from large commercial enterprises. Elsevier, which is one of the largest such publishers, consistently reports profits of more than 30 percent, representing billions of dollars. As Heather Morrison (2010) of the University of Ottawa points out, these profits alone could fund all 1.5 million scholarly articles published each year at a rate parallel to what the open-access publisher Hindawi charges for open access.[8]

- The difficulty lies in making this transition. Demand for access to sub-scription-based journals is not diminishing, so it is difficult for libraries to cancel these big deals to repurpose money to support open-access models. The painful reality is that universities will probably have to spend more money in the near term to eventually spend less in a predominantly open-access environment. But the advantages of moving toward an en-vironment where universities and academic authors themselves are more in control of the scholarly publishing process, including the potential for economic savings, are undeniable.

The future we imagine is one in which libraries and their parent institutions redirect financial resources to support the kind of publishing models that offer the greatest benefit to the scholarly ecosystem as a whole, and that align best with the values and goals of academics and universities. Most often the recipients of this support would likely be university presses, scholarly societies, and non-profit publishers like the Public Library of Science.[9] The shift would be toward supporting the mission of these organizations directly, to enable and sustain the services they provide.

This is a bold vision, and a difficult one to realize. At this point, academic libraries and other organizations are just beginning to engage in experiments about how to fund a newer, more open form of scholarship. A few of those experiments are worth mentioning in detail:

- Unglue.it (https://unglue.it/) is an effort to crowd-fund the release of traditionally published books for greater access using a Creative Com-mons license. The project solicits funds in several ways and offers rights holders remuneration for releasing an openly licensed electronic version of their book(s). Unglue.it has a program that allows libraries to create an account and an unglue.it library web page to publicize the project and manage titles that have been "unglued." As a for-profit company, Un-glue.it represents an innovative approach to serving a broader public mission within the profit-making framework, and it is an experiment that academic libraries should watch carefully.
- Knowledge Unlatched (http://www.knowledgeunlatched.org/) de-scribes itself as a "collaborate initiative enabling open access books. Knowledge Unlatched is helping stakeholders to work together for a sustainable open future for specialist scholarly books. Our vision is a healthy market that includes free access for end users." Knowledge Un-

latched has negotiated with academic publishers to create a collection of potential open monographs and has set a price on that effort. The organization then solicits commitments from academic libraries to raise the necessary funds. When enough libraries commit to pay a set amount, so that the target is reached, an open electronic edition of the book is published. These are new or relatively new academic titles, and the price is equivalent to or less than normal print-purchase prices, so it is an attractive model. Knowledge Unlatched announced in late February 2014 that they had reached the target commitments for their first batch of scholarly books.

- SCOAP3 (http://scoap3.org/) is the most ambitious and most costly effort to date to transition scholarship to open access. It represents a partnership of thousands of libraries who committed funds to flip about a dozen journal titles in the field of high-energy physics from subscription models to open access by paying for open-access journal services rather than buying limited-access journal subscriptions. Once it gathered commitments, it negotiated the cost of the transition with publishers and is making articles from these highly regarded titles open access beginning in January 2014. One of the most interesting aspects of the SCOAP3 project is its potential, as a consortium that controls the funding of the project, to begin to get some control over the actual cost of publication, while providing continuity for journals that have developed excellent reputations over a long period.

Looking at these experiments—and there are many others—one striking thing is that the transition of *Cultural Anthropology* to open access could serve as a catalyst for a SCOAP3-style flip of journals in the social sciences.

Critics sometimes express the concern that the transition we have described from a predominantly commercial, subscription-based model of scholarly publication to one that is open, focused less on profitability, and controlled by scholars and scholarly institutions would create a complex environment. This is undoubtedly true. But one thing libraries know that is sometimes hidden from scholars working in a specific discipline is that the scholarly ecosystem is already very complicated. Each publisher has a different model for distribution, access, and purchase. Each contract—and the Duke University Libraries are party to nearly a thousand different contracts—has different terms and approaches similar issues in different ways. On the level of library consortia, there are again a multitude

of different ways in which cost-sharing is managed, purchases negotiated, and resources managed. One of the reasons why academic libraries are poised to lead this transition is precisely because they have extensive experience with the complexity of the current system and the synoptic vision to manage a radical change.

NEXT STEPS

Academic libraries, like scholarly societies, presses, and individual authors, are part of a complex and evolving ecosystem. The difficult challenge facing all these stakeholders is how to change a whole ecosystem. No single action or actor will be able to achieve this transformation. And that's not necessarily a bad thing. Indeed, the risk of unintended consequences is higher with rapid, dramatic change. But there are things that individuals and organizations can do that will contribute to broader changes. Returning to the ecological metaphor, we can call up the old maxim, "Think globally, act locally."

Here are some ideas of what individuals and groups can do:

- Authors
  - Insist on keeping rights to your works. Do not agree to contracts that give up ownership to your work, and the ability to decide how it might be used in the future, and to whose benefit.
  - Grant rights to those who you think are doing or might do useful things to increase your readership and the potential impact of your work, and to enable potential uses of it that you or your original publisher might not have considered.
  - Make it easier for others to build on what you've done by providing for that possibility up front with an open license.
- Journal managers/editors
  - Reassess what your real goal is—putting out quality research or running a business—and don't confuse means with ends. Investigate whether there are models that would support your ultimate goal through different means.
  - Encourage your authors to keep their rights, and only require from them what you need to make the journal work.
  - Look into competitive services for the different aspects that go into the product you provide, and don't assume that they must all be bundled into a single service provider's product.

- Scholarly societies
  - Investigate other options for funding your operations that will not be reliant on a single commercial entity, which is using your members' work to extract monopoly prices from the community and from funding sources that support you (universities and funding agencies).
  - Talk to libraries and funding agencies about sponsorship of your mission, rather than about the purchase of your products. Your members are at the institutions that could help make the case for this funding transition.
- Publishers
  - Think of what you're doing as providing services rather than selling products, and show your customers why the services you provide are worth the cost you charge. Even in a marketplace where your customers are free to take their business elsewhere, if your services are good and the price is reasonable, you won't lose them.
  - Diversify into other revenue sources. There are opportunities for you to grow and prosper by doing new things, not just by continuing to try to extract higher prices for the same old things, or through enclosing greater amounts of scholarship behind walls.
- Libraries
  - Don't be afraid to experiment and make investments in new models. You hold the biggest funding source for the ecosystem, and have the greatest potential to promote change by deciding where you spend your money.
  - Explain to your community where the funding is going, and how opaque the bundling and pricing model is. Ask them if they'd prefer the money to be spent in different ways, like sponsorships of non-profit, open-access society journals.
- Universities
  - Invest in the transitional moment. The current model costs you more than it should and gets you less than it could. You are the ones who are the intellectual home and financial supporters of all the key players in this space—you have more power over this market than you think, if only you would put your mind to using it.
  - Partner with peers to lessen the risk of change by promoting and funding the transition in concert.

We probably all have a sense that the scholarly publishing ecosystem could work better, and should work better. We understand that as technology changes, scholarly practices change, as do the ways we communicate and want to communicate scholarship. The way we publish probably ought to change too.

Now is a good time to ask: What are we really trying to accomplish? If we were starting from scratch, and without the constraints of precedent, how would we go about achieving this? And only then, finally, how can we start moving toward that from where we are now?

In most discussions about scholarly publishing, we start from the premise that the way it is now is the way it has always been, and must continue to be. This is not only false but self-defeating—or maybe just lazy. We are where we are because we, or our predecessors, made it this way, and we can un-make it or re-make it to meet changing needs, and perhaps more important, to take advantage of new opportunities. The inertia to continue on the current path is strong, and the risks of change to the current established patterns and its beneficiaries are great. But in the end we have to ask whether our goal is to protect established patterns and interests or to serve the goals of scholarship, and where these are not in alignment, whether we are willing to make the effort toward making the system better serve the goals of academics and academia, as well as the public good.

Ultimately, we can either control and manage these changes ourselves or be beholden to, or even become victims of, those who do control and manage them. As those who produce the essential components of this ecosystem and who are their primary users—authors and readers—as well as those whom this ecosystem was primarily designed to serve, academics should reassert themselves in the scholarly communication and publishing system, and ensure that the ecosystem returns to its original goal of serving scholarship first.

ABSTRACT

Scholarly publishing, and scholarly communication more generally, are based on patterns established over many decades and even centuries. Some of these patterns are clearly valuable and intimately related to core values of the academy, but others were based on the exigencies of the past, and new opportunities have brought into question whether it makes sense to persist in supporting old models. New technologies and new publishing models raise the question of how we should fund and operate scholarly publishing and scholarly communication in the future, moving away from a scarcity model based on the exchange of physical goods that restricts access to scholarly literature unless a market-based exchange takes place. This essay describes emerging

models that attempt to shift scholarly communication to a more open-access and mission-based approach and that try to retain control of scholarship by academics and the institutions and scholarly societies that support them. It explores changing practices for funding scholarly journals and changing services provided by academic libraries, changes instituted with the end goal of providing more access to more readers, stimulating new scholarship, and removing inefficiencies from a system ready for change. [scholarly publishing; scholarly communication; open access; libraries]

NOTES

1. For a critique of the utility of the impact factor, see Priem et al. 2010.
2. An earlier discussion of this possibility can be found in Priem and Hemminger 2012.
3. An explanation of the Duke Libraries COPE fund can be found at http://library. duke.edu/research/openaccess/cope. More detail is provided by Stuart Shieber (2009) of the Harvard Office for Scholarly Communication.
4. A list of the fees charged by Hindawi can be found on their website. See http:// www.hindawi.com/apc/.
5. The fee for publishing in Cell Reports can be found on the CellPress website. See http://www.cell.com/cell-reports/faq.
6. The recently formed Library Publishing Coalition published a directory in 2012 that lists almost 600 library-published journals, which is available at http://www. librarypublishing.org/resources/directory-library-publishing-services.
7. See http://www.arl.org/about.
8. Morrison's post is part of an ongoing series on the transition to open access.
9. For more information about the Public Library of Science (PloS), see http:// www.plosone.org/.

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