

Trends Favoring Open Access

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This article began with a simple attempt to identify trends that were changing scholarly communication. I expected to find trends that were supporting the progress of OA and trends that were opposing it or slowing it down. The resulting welter of conflicting trends might not give comfort to friends or foes of OA, or to anyone trying to forecast the future, but at least it would describe this period of dynamic flux. It might even explain why OA wasn't moving faster or slower than it was.

But with few exceptions I only found trends that favored OA. Maybe I have a large blind spot; I'll leave that for you to decide. I'm certainly conscious of many obstacles and objections to OA, and I address them every day. The question is which of them represent trends that are gaining ground.

While it's clear that OA is here to stay, it's just as clear that long-term success is a long-term project. The campaign consists of innumerable individual proposals, policies, projects, and people. If you're reading this, you're probably caught up in it, just as I am. If you're caught up in it, you're probably anxious about how individual initiatives or institutional deliberations will turn out. That's good; anxiety fuels effort. But for a moment, stop making and answering arguments and look at the trends that will help or hurt us, and would continue to help or hurt us even if everyone stopped arguing. For a moment step back from the foreground skirmishes and look at the larger background trends that are likely to continue and likely to change the landscape of scholarly communication.

I've found so many that I've had to be brief in describing them and limit the list to those that most affect OA.

- (1) First there are the many trends created by OA proponents themselves: the growing number of OA repositories, OA journals, OA policies at universities, OA policies at

public and private funding agencies, and public endorsements of OA from notable researchers and university presidents and provosts. Each new OA repository, journal, policy, and endorsement contributes to a growing worldwide momentum and inspires kindred projects elsewhere. Funding agencies are now considering OA policies in part because of their intrinsic advantages (for increasing return on investment by increasing the visibility, utility, and impact of research) and in part because other funding agencies have already adopted them. The laggards are being asked why the research they fund is less worth disseminating than the research funded elsewhere. The growing mass of OA literature is becoming critical in the sense that the growth is now a cause, and not just an effect, of progress. OA literature is the best advertisement for OA literature; the more we have, the more it educates new scholars about OA, demonstrates the benefits of OA, and stimulates others to provide or demand it.

- (2) Although knowledge of OA among working researchers is still dismally low, every new survey shows it increasing, and every new survey shows increasing rates of deposits in OA repositories and submissions to OA journals. The absolute numbers may still be low, but the trajectories are clearly up.
- (3) More scholars are posting their articles online even if they don't have their publisher's permission. As long ago as October 2005, Alma Swan found that seven out of eight articles published in the inaugural issue of *Nature Physics*, which had a six month embargo on self-archiving, were free online somewhere on the day of publication. Regardless of what this shows about copyright, it shows a healthy desire for OA. We don't know whether the volume of OA produced this way is large or small, but already (according to the April 2007 RIN study) readers routinely try Google and email requests to the author before interlibrary loan when they hit a pay-per-view screen at a journal Web site. Both trends—posting OA copies, with or without permission, and searching for OA copies—are growing.
- (4) Subscription prices are still rising faster than inflation after more than three decades. A March 2006 study by the ALPSP found that high journal prices cause many more cancellations than OA archiving. Rapidly rising prices undermine the sustainability of the subscription model. They undermine publisher arguments that all who need access already have it. They undermine publisher arguments that we shouldn't fix what isn't broken. They undermine the credibility, and even the good faith, of publishers who argue that OA threatens peer review, by threatening their subscriptions, when their own hyperinflationary price increases are far more potent in the same cause. They strengthen the incentives for libraries, universities, funders, and governments to join the campaign for OA.
- (5) The cost of facilitating peer review is coming down as journal management software improves, especially the free and open source packages like DPubS, E-Journal, ePublishing Toolkit, GAPworks, HyperJournal, OpenACS, SOPS, TOPAZ, and the

- segment leader, Open Journal Systems. This reduces the cost of publishing a peer-reviewed journal, improves the financial stability of peer-reviewed OA journals, and multiplies the number of business models that can support them.
- (6) More publishers are launching hybrid OA journals, which will make any of their articles OA if an author or author-sponsor pays a publication fee. I've been critical of many of these programs, in part for high prices and needless restrictions that reduce author uptake. But even with low uptake they will (slowly) increase the volume of OA literature, (slowly) spread the OA meme to more authors and readers, and (slowly) give publishers first-hand experience with the economics of one kind of OA publishing.
 - (7) More journals are willing to let authors retain key rights, especially the right of postprint archiving, and more are willing to negotiate the terms of their standard copyright transfer agreement. More authors are willing to ask to retain key rights and more institutions are willing to help them. More organizations are drafting "author addenda" (contract modifications to let authors retain key rights), and more universities are encouraging their faculty to use them. There are now major addenda from SPARC, Science Commons, OhioLINK, the Committee on Institutional Cooperation, and a handful of individual universities. The default in most journals and fields is still for authors to transfer nearly all rights to publishers, including the right to decide on OA for the peer-reviewed postprint. Corrections to this imbalance haven't gone nearly far enough, but the slope of the curve is definitely up.
 - (8) More and more toll-access (TA) journals are dropping their print editions and becoming online-only. Steven Hall of Wiley-Blackwell predicts that 50% of scholarly journals will become online-only within the next 10 years. As high-quality, high-prestige journals make this transition, scholars who still associate quality and prestige with print will (happily or unhappily) start to unlearn the association. At the same time, the rise of high-quality, high-prestige OA journals will confirm the new recognition that quality and medium are independent variables. TA publishers are joining OA advocates in creating an academic culture in which online publications can earn full credit for promotion and tenure. Online publications needn't be OA, of course, but changing the culture to accept online publications is more than half the battle for changing the culture to accept OA publications.
 - (9) More journals, both OA and TA, encourage or require OA to the data underlying published articles. Major publisher associations like ALPSP and STM, which lobby against national OA policies for literature, encourage OA for data. Even when these policies don't cover peer-reviewed articles, they accelerate research, demonstrate the benefits of unrestricted sharing, and build expectations and momentum for OA in other categories.

- (10) More journals (OA and TA) are integrating text and data with links between text and data files, tools to go beyond viewing to querying data, dynamic charts and tables to support user-driven what-if analyses, and multimedia displays. Some types of integration can be done in-house at the journal and kept behind a price wall. But other types, especially those added retroactively by third parties, require OA for both the text and data. OA invites motivated developers to use their cleverness and creativity, and the existence of motivated developers invites authors and publishers to make their work OA.
- (11) Thomson Scientific is selecting more OA journals for Impact Factors, and more OA journals are rising to the top cohort of citation impact in their fields. For scholars and institutions using Impact Factors as crude metrics of quality, this trend legitimates OA journals by showing that they can be as good as any others. There are other gains as well. Because OA increases citation impact (studies put the differential at 40–250%, depending on the field), high-quality OA journals can use citation impact to shorten the time needed to generate prestige and submissions commensurate with their quality. OA journals with rising impact are successfully breaking a vicious circle that plagues all new journals: needing prestige to attract high-quality submissions and needing high-quality submissions to generate prestige. OA journals high in impact, quality, and prestige are improving their own fortunes and changing expectations for other OA journals. But they are also making two little-known truths better known: first, that OA can help journals, not just readers and authors, and second, that a journal's impact, quality, and prestige do not depend on its medium or business model—except insofar as OA models actually amplify impact.
- (12) New impact measurements are emerging that are more accurate and nuanced, more inclusive, more timely, and less expensive than Impact Factors. These include Eigenfactor, h-Index, Journal Influence and Paper Influence Index, Mesur, Usage Factor, Web Impact Factor, and Y Factor. What most of them have in common is the harnessing of new data on downloads, usage, and citations made possible by OA. In this sense, OA is improving the metrics and the metrics are improving the visibility and evaluation of the literature, especially the OA literature.
- (13) Download counts are becoming almost as interesting as citation counts. Not only are they being incorporated into impact metrics, but a CIBER study (September 2005) discovered that senior researchers found them more credible than citations as signs of the usefulness of research. A Brody-Carr-Harnad study (March 2005) found that early download counts predict later citation counts. No one thinks download counts mean the same thing as citation counts, but they're easier to collect, they correlate with citation counts, and they're boosted by OA. In turn they boost OA; repository managers have learned that showing authors their download tallies will encourage other authors to deposit their work.

- (14) The unit of search has long since shifted from the journal to the article. Now the unit of impact measurement is undergoing the same transition. Authors and readers still care about which journal published a given article, but they care less and less about which other articles appeared in the same issue. More and more, finding a relevant article in an OA repository, separated from its litter mates, gives searching scholars all they want.
- (15) Big publishers are still getting bigger: merging with one another (most recently, Wiley and Blackwell), acquiring smaller publishers, and acquiring journals. Market consolidation is growing, monopoly power is growing, and bargaining power by subscribers is declining. This interests government anti-trust officials—who in the UK, for example, would already have acted if the OA movement hadn't give them a reason to watch and wait. It gives the players representing research rather than for-profit publishing (universities, libraries, funders, and governments) additional incentives to work for OA. It also gives the smaller, non-profit publishers, excluded from big deals and competing for limited subscription funds against the market titans, reasons to consider the big publishers more threatening than OA and reasons to consider OA a survival strategy.
- (16) More for-profit companies are offering services that provide OA or add value to OA literature: repository services, search engines, archiving software, journal management software, indexing or citation tracking services, publishing platforms, print preservation. These services create or enhance OA literature, fill the cracks left by other services, create a market for OA add-ons, and show another set of business judgments that OA is on the rise. If you think, as I do, that one promising future for non-OA publishers is to shift from priced access to priced services for adding value to OA literature, then these projects can help opponents become proponents.
- (17) More mainstream, non-academic search engines like Google, Yahoo, and Microsoft are indexing OA repositories and journals. This makes OA content easy to find for users unacquainted with more specialized tools. This in turn helps persuade even more publishing scholars that OA really does increase visibility and retrievability. Hence, it helps correct a particularly common and harmful misunderstanding among authors: that work on deposit in an institutional repository is only visible to people who visit that particular repository and run a local search.
- (18) While OA journals and repositories continue to multiply, other vehicles for delivering OA are finding more and more serious scholarly applications: blogs, wikis, ebooks, podcasts, RSS feeds, and P2P networks. This is more than a geeky desire to play with cool new tools. It's a desire to find ways to bypass barriers to communication, collaboration, and sharing. Serious researchers are discovering that these tools are actually useful, not just cool, and are taking advantage of them. Like cell

phones, wifi, and the internet itself before them, these tools are overcoming the stigma of being trendy and moving from the periphery to the mainstream.

The direct benefit is that all these tools presuppose OA. Their widespread use enlarges the volume of OA research communication and spreads the conviction that research benefits from both the speed and the reach of OA. The indirect benefit is that they foster disintermediation (and hence reduce costs and delays) without sacrificing peer-mediated forms of quality control. Since the rise of peer-reviewed journals in the 17th century, most publicly disseminated works of scholarship have been vetted and distributed by publishers. Letters and lectures were exceptions. Today, the categories of exceptions, the volume of research-reporting they represent, and their integration into the workflow of ordinary research, are all growing.

- (19) New and effective tools for collaboration are triggering adoption and excitement, e.g., social tagging, searching by tags, open peer commentary, searching by comments, social networking, community building, recruiting collaborators, facilitating work with collaborators you already have, following citation trails backward and forward, following usage-based “similar to” and “recommended” trails, open APIs, open standards, and mash-ups. Collaboration barriers are becoming almost as irritating and inimical to research as price and permission barriers. A new generation of digital scholars is deeply excited by the new collaboration services that presuppose and build on OA.

To focus on social tagging and folksonomy tools for a moment: when applied to research literature (Connotea, CiteULike) and combined with OA and search engines, they do more than OA alone, or OA plus search engines, to enhance the discoverability of OA literature. Because tags are added retroactively to open content by uncoordinated users, they stimulate the imagination of creative developers; once we have OA to literature and data, we can add layers of utility indefinitely.

- (20) Interest in OA and projects to deliver on that interest are growing fast in the humanities. Humanists are exploring OA for books and journals, and exploring the universe of useful services that can be built on an OA foundation, from searching and annotation to text-mining, co-writing, and mash-ups. We already knew that OA was useful to scholars, as authors and readers, in every field. But the humanities are now showing that OA is not limited to fields with high journal prices (to serve as a goad) or high levels of research funding (to pay for it).
- (21) Huge book-scanning projects, particularly those from Google, the Open Content Alliance, The European Library, the Kirtas-Amazon partnership, and Project Gutenberg, steadily increase the number of print books available in some free-to-read digital form. We'll soon reach a crossover point when more full-text, public-domain books are freely available online than on the shelves of the largest university library. Apart from lowering the access barriers to a large and uniquely

valuable body of literature, the book-scanning projects together create one more large real-time demonstration that useful literature is even more useful when it's OA.

- (22) At the same time, the price of book scanning is dropping quickly. The usefulness of book literature and the absence of legal shackles on public domain texts are attracting large corporations, whose investments and competition are driving down the costs of digitization. The repercussions will be felt in every category of print literature, including the back runs of print journals.
- (23) Steady decreases in the size and cost of hardware and memory are making possible steady increases in the volume of data people can carry in their palm or pocket. Free *offline* access to usefully large digital libraries is on the horizon. Every effort for free online access will free up content for portable offline access as well.
- (24) Evidence is mounting that OA editions increase the net sales of print editions for some kinds of books, including scholarly monographs. This not only enlarges the corpus of OA literature, but chips away at the simplistic, reflexive fear that OA is incompatible with revenue and profit. Every month another university press explores this space by creating an imprint or division dedicated to dual-edition monographs (OA editions and priced/printed editions), OA-plus-POD monographs, or OA-only monographs.

On the other hand, OA books may only stimulate sales of print editions as long as most people dislike reading whole books on screen. This trend may be reversed by a counter-trend to improve ebook readers.

- (25) A textbook pricing crisis is stimulating OA solutions just as the journal pricing crisis before it stimulated OA solutions. There are now major projects to produce OA textbooks from the following: Amedeo, Atomic Dog, BookPower, the California Open Source Textbook Project, CommonText, the Free Curricula Center, Free High School Science Texts, Freeload Press, FreeTechBooks, Global Text Project, Libertas Academica, Liberty Textbooks, Medical Approaches, MedRounds Publications, nexttext, the Open Textbook Project, the Potto Project, Science Classics, Textbook Revolution, and Wikibooks.
- (26) More universities and independent non-profits are creating open courseware, OA teaching and learning materials, and other open educational resources (OERs). These help all teachers and students, even those at affluent schools. Like the kindred movement for OA to research literature, this one is demonstrating to a growing audience that useful content is more useful when OA. It also helps generalize a fact highlighted by researchers: that content creators who depend on salaries rather than royalties, or who write for impact and not for money, have everything to gain and nothing to lose by consenting to OA.
- (27) There is a rising awareness of copyright issues in the general public, rising frustration with unbalanced copyright laws, and rising support for remedies by

governments (legislation) and individuals (Creative Commons licenses and their equivalents). Copyright laws are still grotesquely unbalanced, and powerful corporations who benefit from the imbalance are fighting to ensure that they are not revised in the right direction any time soon. But in more and more countries, an aroused public is ready to fight to ensure that they are not revised in the wrong direction either, something we haven't seen in the entire history of copyright law.

However, this only guarantees that the content industry will have a fight, not that users and consumers will win. Nearly every week the content industry scores another victory, either in court or in arm-twisting another developing country into harmonizing its copyright laws with the unbalanced North. There are victories for balance as well, but less often in courts and legislatures than in think tanks, conference declarations, government commissions, and newspaper editorials. The trend is only for awareness and opposition, but it's sharply up.

- (28) The shock of the new is wearing off. OA is gradually emerging from the fog of misunderstanding. For this one, I won't be brief.

Scholars who grew up with the internet are steadily replacing those who grew up without it. Scholars who expect to put everything they write online, who expect to find everything they need online, and who expect unlocked content they may read, search, link, copy, cut/paste, crawl, print, and redistribute, are replacing those who never expected these boons and got used to them, if at all, looking over their shoulder for the copyright police. Scholars who expect to find the very best literature online, harmlessly cohabiting with crap, are replacing scholars who, despite themselves perhaps, still associate everything online with crap.

Some lazy scholars believe that if something is not free online, then it's not worth reading. This has never been true. However, it's gradually becoming true, and those who want it to become true can accelerate the process. Those who want to live in a world where all peer-reviewed journal literature is free online are themselves growing in numbers and will soon have the power in universities, libraries, learned societies, publishers, funding agencies, and governments to bring it about.

Moreover, as the OA percentage of research literature continues to grow, then more users will start to act (with or without justification) as if all research literature worth reading is already OA. As this practice spreads, it will function as one more incentive for authors and publishers to make their work OA.

In short, generational change is on the side of OA.

But even the passage of time without generational change is on the side of OA. Time itself has reduced panic and panic-induced misunderstandings of OA. Everyone is getting used to the idea that OA literature can be copyrighted, the idea that OA literature can be peer-reviewed, the idea that the expenses for producing OA literature can be recovered, and the idea that OA and TA literature can co-exist

(even for the same work). Surprisingly, many of the early obstacles to OA can be traced to the fact that many seasoned academics just couldn't grasp these ideas. The problem was not incoherent ideas or stupid people—though both hypotheses circulated widely—but panic, unfamiliarity, and the violation of unquestioned assumptions. For some stakeholders, clear explanations, repetition, or experience with working examples solved the problem. But for others it just took time.

When *Nature* broke the story in January 2007 that the Association of American Publishers, American Chemical Society, Elsevier, and Wiley, had hired Eric Dezenhall, “the pit-bull of PR,” to help their lobbying campaign against OA, the resulting controversy brought OA to the attention of many academics for the first time. Unlike earlier waves of newcomers, for example, after Congress asked the NIH to develop an OA policy in July 2004, this wave typically got it right the first time. “Of course OA is compatible with peer review.” “Of course there are no copyright problems if the copyright-holder consents.” “Of course the public deserves OA to publicly-funded research.” “Of course the argument that OA is a kind of censorship is Orwellian doublespeak.”

When newcomers got OA wrong in the past, sometimes they had been misled by an explicit error published somewhere, perhaps by another newcomer. But most of the time they just made unconscious assumptions based on incomplete information and old models. This is the shock of the new at work. If OA uses the internet, then it must bypass peer review. (Right?) If OA articles can be copied *ad lib*, then there must be copyright problems. (Right?) If OA is free of charge for end-users, then its proponents must be claiming that it costs nothing to produce and it must be impossible to recover the costs. (Right?) These conclusions, of course, were uninformed leaps. Many who understood the conventional model (priced, printed, peer-reviewed, copyright-protected) saw a proposal for something different and didn't know how many parameters of the old paradigm the new proposal wanted to tweak. Their hasty and incorrect surmise: all of them. It was a classic case of seeing black and white before seeing shades of gray.

Suddenly everything good about the present system had to be defended, as if it were under attack. A lot of energy was wasted defending peer review, when it was never under attack. A lot of energy was wasted defending copyright—or celebrating its demise—when it was never under attack. (More precisely, copyright was under attack from other directions, but OA was compatible with unrevised, unbalanced, unreconstructed copyright.) The debate about OA often drifted toward the larger debate about what was good and bad, or functional and dysfunctional, in the present system of scholarly communication overall. This was valuable, but mixing narrow OA issues with broader ones created false impressions about what OA really was, how compatible it was with good features of the present system, and how easy it was to implement.

The OA debates still waste a lot of energy talking about peer review and copyright. The shock of the new hasn't fully worn off; it's wearing off gradually. OA advocates, growing in numbers and effectiveness, can't keep the idea from being distorted or misunderstood. But they have kept it from being distorted or misunderstood as much as it would have been otherwise.

As time passes, we see a steady rise in the proportion of correct to incorrect formulations of OA in the widely-read discussions. When people encounter a fragmentary version of the idea for the first time today, their guesswork to flesh it out is guided by a much more reliable range of clues than just a few years ago. If they take the time to run an online search, the chances that they'll find good information before someone else's guesswork are nearly 100%.

It's tempting to focus on the elegance of OA as a solution to serious problems and overlook the need for the sheer passage of time to overcome the shock of the new. Even if we acknowledge the need for cultural change in the transition to OA—far more critical than technological change—it's easy to underestimate the cultural barriers and the time required to work through them. Yes, OA is compatible with peer review, copyright, profit, print, prestige, and preservation. But that doesn't quiet resistance when those facts about it are precisely the ones hidden by false assumptions caused by the shock of the new.

I'm not saying that all resistance to OA is, or was, based on a misunderstanding of the idea itself. But much past resistance was based on misunderstanding; that portion is in decline; and that decline is largely due to the passage of time and the rise in mere familiarity with a new idea.

The changes wrought by time point up a sad irony in the 15 year history of OA. Nobody is surprised when cultural inertia slows the adoption of radical ideas. But cultural inertia slowed the adoption of OA by leading many people to mistake it for a more radical idea than it actually is.

I know that this account of trends would not be complete without those that work *against* OA. But there aren't many. I've mentioned the improvement in ebook readers, which may interfere with the ways that OA books increase sales for print editions. Here are two more.

- (29) Researchers themselves control the rate of progress toward OA, but after all these years most of them are still oblivious to its existence and benefits. As I've noted above, there is a trend toward greater familiarity and understanding. But there is also a longstanding counter-trend of impatience with anything that distracts attention from research. This preoccupation is generally admirable and makes researchers good at what they do. But even from the narrow perspective of what advances research, it is having perverse consequences and limiting the audience, impact, and utility of the research on which scholars are so single-mindedly focused.

- (30) Some publishers opposed OA from the beginning, and sometimes their opposition was fierce. But some who opposed it apparently saw it as a utopian fantasy of naïve academics that would never be embraced by serious researchers, let alone by serious institutions like universities, libraries, foundations, and government agencies. Publishers in the second camp, who thought OA would be alarming if it caught on, but then hit the snooze button, are now hearing the alarm. While some publishers actively support OA, or experiment with it in good faith, those that oppose it are getting their act together and spending serious money to lobby against government OA policies. In money and person-power, their lobbying forces in Washington and Brussels vastly exceed our own. All we have going for us are good arguments and good trends.

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Knowledge Unbound

Selected Writings on Open Access, 2002–2011

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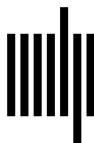
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