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IDEALISM AND OPPORTUNISM

Walt Crawford

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Open-Access Journals: Idealism and Opportunism

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Walt Crawford writes, researches, and occasionally speaks on issues related to libraries, technology, policy, and media. He has written sixteen books published by ALA Editions; Information Today, Inc.; G. K. Hall; and others, beginning with *MARC for Library Use* and including most recently *Successful Social Networking in Public Libraries* (ALA Editions, 2014) and *The Librarian's Guide to Micropublishing* (ITI, 2013). He has also published a free e-journal/newsletter since 2001, *Cites & Insights: Crawford at Large*, and self-published several library research projects. Crawford was a Senior Analyst at RLG for four decades. He previously wrote *Library Technology Reports* vol. 50, no. 4, "Big-Deal Serial Purchasing: Tracking the Damage."

Abstract

Open-access journals have become widespread in recent years, but so have misunderstandings about such journals, fueled by a lack of actual data. This issue of *Library Technology Reports* (vol. 51, no. 6), "Open-Access Journals: Idealism and Opportunism," looks at the state of open-access journals as of mid-2014 and how they got there, based on visits to the website of every open-access journal accessible to a reader of English. The report shows the state of gold open access (OA), including the percentage of journals that require author-side fees (and the percentage of articles published by those journals), the number of journals and articles overall and by broad subject category, the apparent "gold rush" since 2006 within certain subject categories, and more. The report includes advice for dealing with gold OA journals and recommending them to scholars and suggestions for library actions to improve open access.

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A Gold OA Overview

Open-access (OA) literature is available online to be read for free by anyone, anytime, anywhere, without registration or other hindrance—as long as they have Internet access.

That's the core of OA, and it's a growing factor in scholarly articles (and to a lesser extent monographs). But even as OA grows, confusion as to the amount and nature of OA publishing seems to grow, aided by a lack of clear, concrete information and sometimes by deliberate misinformation.

This report grows from an attempt to determine some of the facts behind the confusion by the simple process of looking at each OA journal site and seeing what was going on.

After a quick refresher course on the basics of OA, this chapter defines the portion of OA being considered here and some of the fundamental issues. An overview of mainstream OA journals shows the extent to which it makes sense to group them into three large and two very small areas—and what constitutes the mainstream.

Chapters 2 through 6 look at OA journals in more detail and with different approaches: journals that charge author-side fees or *don't* charge such fees; journals by volume of articles; some of the economics involved; journals by starting date; and journals by subject category. We'll also look at "journals"—things that have journal names but haven't actually published articles—and other oddities.

Chapters 7 and 8 consider ways to deal with OA journals, suggestions for advising would-be writers, and what libraries and librarians might do to improve the field.

Why should librarians care? Public librarians should care because OA can provide access to research that your patrons may find valuable and that you can't afford to subscribe to. Academic librarians should care because your institution can't keep buying all the journals your community could use and because your library can play an active role in improving the situation (possibly reducing your costs in the long run). All librarians should care because OA means more access to more scholarship for more people.

The Basics

Gold OA consists of journals that make all peer-reviewed articles freely available for online reading as soon as they're published, without requiring fees or registration to read those articles.

Green OA consists of peer-reviewed articles deposited in freely available digital repositories. As currently practiced, green OA may include articles in accepted but not copyedited or formatted form—and may include embargoes.

This report is about gold OA. It's fair to say that "open-access journals" should be synonymous with gold OA. Gold OA does *not* imply author-side charges or article processing fees (APCs): most gold OA journals do not charge such fees.

Because the focus here is on OA journals, this report does not engage in the debate over the relative merits of gold and green.

Some other related terms you may encounter:

- **"Hybrid" journals** are subscription journals that are supposed to offer free access to some articles for which extra, usually very high, fees have been paid. Such journals are *not* included in this report.
- **"Platinum OA"** is an attempt to differentiate gold OA journals with no fees. **"Diamond OA"** is an attempt to define a new category, journals that exist only as overlays on subject archives such as ar×iv. I regard both as needlessly confusing

the issue (Gold OA covers them both), and these terms don't appear in the rest of this report.

- **The *Directory of Open Access Journals*** (*DOAJ*) is an online directory that constitutes the best starting point for consideration of individual journals. All journals discussed in chapters 2 through 5 of this report were in *DOAJ* as of May 2014.
- **Open Access Scholarly Publishers Association** (OASPA) is an association including several of the larger OA publishers. Because OASPA represents less than 25 percent of the journals in *DOAJ*, it is not used as a filter for this report. The few hundred OASPA journals that were *not* in *DOAJ* in May 2014 are discussed in chapter 6 and briefly in this chapter.
- **"Predatory journals"** is a term used by Jeffrey Beall for publishers and journals that he has unilaterally determined to be questionable. (He now uses "possible, potential or probable" to weaken "predatory.") I believe that Beall's lists are irrelevant to any open-minded understanding of OA. Chapter 6 discusses the thousands of journals and "journals" published by publishers and journals on Beall's lists that are *not* in *DOAJ*.
- **Gratis OA** consists of articles that are readable for free online, but possibly no more than that.
- **Libre OA** consists of articles that have at least some additional forms of free usability, ideally including the ability to download, redistribute, use for derivative works, and search or data-mine.

Directory of Open Access Journals (DOAJ)
http://doaj.org

All libre OA is gratis. Although full libre OA is certainly desirable, its presence is such a patchwork that this report does not attempt to distinguish journals that require it and those that allow it.

Journals that impose libre OA will typically state that all contents use a Creative Commons BY license, which requires only attribution for any reuse and is part of the most formal definitions of OA. I have not tracked such statements. When checked in January 2015, *DOAJ* shows less than one-quarter of OA journals using CC-BY as the standard license.

For a deeper discussion of OA, see my 2011 ALA Editions Special Report, *Open Access: What You Need to Know Now*, ISBN 978-0-8389-1106-8.

The Fundamental Issues

This report is not about whether gold OA is worthwhile or whether OA itself is worthwhile. I take those as givens, especially since I'm one of the vast majority of people worldwide who simply does not have access to most scholarly literature *unless* it's OA. This report is also not about whether OA (in all its forms) is growing. That growth is well documented and unmistakable.

What this report does is show the OA journal landscape (or gold OA landscape) as it was in mid-2014 and from 2011 through 2013 and offer breakdowns to make that landscape more understandable.

The OA journal landscape is too complex to show fairly with a few simple facts. For example, "Most OA journals don't impose APCs" is a true statement. But so is "Most OA articles are in journals with APCs." Both statements oversimplify the landscape. Similarly, while an imputed average charge per article is interesting and calculable ($630 in 2013), it's also essentially meaningless.

Some of the questions this report will help answer:

- Is gold OA a significant portion of scholarly publishing—and, if so, how big is it and how fast is it growing?
- How do subject areas differ in terms of gold OA publishing?
- How much money might be involved in gold OA APCs? (That's really two questions: How much do journals charge per article, and how much revenue might journals be gaining from those charges?)
- How many articles are published in a typical OA journal (or, realistically, in various sorts of OA journals)?
- How do OA journals and their policies differ by starting date?
- Beyond major subject areas, do OA journals differ significantly by narrower subject categories?
- How can authors and readers spot questionable journals?

It's possible to give rough single-sentence answers to some of those questions. It's also misleading, with the possible exception of the first question. The simple answers to that multipart question: yes; around 20 percent of refereed scholarly articles in 2013 (and roughly one-quarter of the journals); and around six times as many articles in 2013 as in 2006. But that 20 percent figure involves at least one untestable assumption (that there were two million scholarly articles overall in 2013). By the end of this report you should have a better sense of answers to all of the questions.

Idealism and Opportunism

In the early days of open-access publishing, going back to 1987 and the founding of *New Horizons in Adult Education,* and proceeding at least until 2001,

it's fair to say OA was all about idealism. Groups of people and societies started new online-only journals because they saw gaps in the literature, needs to be met. Few (if any) of the early journals had fees.

During the early years of the new millennium, idealism still dominated the OA landscape, and it still clearly plays a major role: *DOAJ* includes more than 1,400 journals founded since 2009 that do *not* charge fees and many more that charge nominal fees.

But as OA has become more widely known and funding agencies have agreed to support it, opportunism has come into play. In addition to fees required to keep a journal going as it transitions from subscription to open access, there are two new trends: new journals with very high APCs begun by major subscription-journal publishers and new journals begun by small and previously nonexistent publishers because there's money to be made in gold OA. There's also growth in "hybrid" journals, but to date there's little evidence that such journals do much to improve access or stabilize long-term costs.

While chapter 4 includes a more detailed analysis of starting dates in OA journals, a simple set of comparisons (all based on *DOAJ* journals accessible to English-reading people that are actually publishing articles) shows the extent to which opportunism has joined idealism as a basis for OA journals:

- From 1990 through 1999, 507 OA journals began that do not charge fees, while 77 began that do: a free-to-fee ratio of 6.6 to 1.
- From 2000 through 2004, there were 824 new no-fee journals and 144 new fee-charging journals: a ratio of 5.7 to 1.
- From 2005 through 2009, there were 1,322 new no-fee journals and 613 new fee-charging journals: a ratio of 2.2 to 1.
- From 2010 through 2013, there were 1,407 new no-fee journals and 1,181 new fee-charging journals: a ratio of 1.2 to 1.

I think of the period from 2006 through 2012 as the gold rush, and the rush may be declining. It's discussed further in chapter 4.

Opportunism is a loaded term. Publishing *does* cost money, and it's reasonable to believe that large-scale journals are difficult to support entirely on the basis of institutional or association subsidies, without author-side fees or substantial grant funding. And, of course, there's a different balance of idealism and opportunism in a journal charging $100 per article, one charging $1,000, and one charging $5,000 or more. This study doesn't consider how well each journal carries out all the tasks associated with peer review and publishing and whether a journal is sustainable, but those are legitimate questions for journals with no fees or very low fees. That's an exceedingly complex subject since it also raises the questions of whether all the tasks *should* be carried out and at what level.

What fees are reasonable or unreasonable? There's no simple answer to that question. The answers vary based on available government, association, and institutional subsidies (and in-kind subsidies), the size of the journal, the subject area of the journal (some subjects may require much more rigorous peer review than others), and many other factors. I've chosen a breakpoint of $1,000 as one level at which it's reasonable to ask questions about whether a journal should need that much money—but as a single breakpoint, it's arbitrary and certainly wrong in some cases. Based on various initiatives, it's possible to suggest $90 or $500 or $625 or $1,350 as a "justifiable costs per article" point—and those may all be right and wrong.

There are also interesting combinations of idealism and opportunism, including a benign form of opportunism, seeing a gap and filling it. One such gap is the extent to which less-developed nations aren't well served by existing journals; a blend of governmental, cooperative, and private initiatives has yielded hundreds of new OA journals (some with APCs, some without) to provide such service.

Look at that last bullet again: there's *still* a huge amount of idealism in OA publishing. There are more new OA journals *without* fees from 2010 through 2013 than there were in 2005 through 2009—and more than in the 15 years before 2005. The balance may have shifted, but it's not all opportunism by any means. Two clarifications: 218 currently OA journals began before 1990, and there are 196 *very* opportunistic journals in *DOAJ*, ones that almost certainly have APCs but don't state them. Of that 196, 103 started in 2010–2013, and another 53 started in 2005–2009.

A caveat regarding OA journals with no fees: for some of them, "for now" needs to be added as a qualifier, as publishers waive fees for some period in order to increase submissions. That appears to be the situation for 330 journals, or less than 8 percent of the free OA journals in *DOAJ*—and those 330 journals published a total of just under 7,000 articles in 2013, or 5 percent of the total published in no-fee journals. Chapter 5 takes up fees in more detail.

DOAJ and Exclusions

Most of this report deals with a large subset of journals listed in the *Directory of Open Access Journals* as of May 7, 2014. *DOAJ* is the best available resource for OA journals. It doesn't include everything, but it includes almost every OA journal worth considering for readers or authors. Exceptions include brand-new journals and, in the future, journals that publish very few articles each year (fewer than five in any year). Chapter 7 discusses those exceptions.

On May 7, 2014, *DOAJ* included 9,709 journals. I tried to reach more than 8,000 of the journal websites, omitting journals that did not list English as one of their languages, since I would not be able to evaluate those journals. In the end, there were some 700 of those 8,000 that were reachable but didn't have enough English in the interface for me to be able to determine key measures: whether there was an APC (and, if so, how much it was); whether the journal consisted of refereed scholarly articles; and how many such articles were published each year.

The dataset used for this report is 7,301 journals, omitting 2,408 journals. Most journals that publish large numbers of articles are in English or have English as an option. Based on journals that report article-level metadata to *DOAJ*, it appears that roughly 18 percent of articles appear in journals without English as a language option. As a guesstimate, then, article counts in this report may be 18 to 20 percent low. Based on non-English journals that I *could* evaluate and on *DOAJ* figures, it's likely that the vast majority of the 2,407 other journals—70 to 80 percent—do *not* have APCs, so calculations of potential revenue are probably less than 20 percent low.

Article counts are approximate, not only because of missing journals but also because I used approximations in some cases (mostly prolific journals without counting mechanisms) and because what constitutes a refereed article isn't always clear. For smaller journals, where I was manually counting articles, I omitted short communications, book reviews (in most journals), and the like from the counts. For larger journals, such exceptions are rare, and I used shortcuts when available. I'm confident that the picture painted here is accurate in terms of trends and overall patterns; I'm also confident that some of the numbers are *not* accurate down to the last digits. A rule of thumb is probably two or three significant digits—the rest may be approximate. (The exception: potential maximum revenue figures may be *much* higher than reality.)

Other Exclusions

In addition to journals that are opaque to monolingual English readers like me, there are 811 other journals that don't show up in the analysis that follows or in the figures already offered, leaving 6,490 journals that form the basis for this report. The 811 are missing for several reasons:

- **Empty:** 71 journals did not have any published articles between January 1, 2011, and June 30, 2014. Most either explicitly ceased or merged into other journals.
- **Not OA:** 165 journals did not fit the definition of gold OA journals that I chose to use for this study. That includes at least seven consisting entirely of commissioned articles; more than 50 consisting of conference or workshop proceedings; more than a dozen that are magazines (with so few peer-reviewed articles that I couldn't find them); three with embargo periods; at least eight that require subscriptions or otherwise block access; a dozen or so where articles are explicitly *not* peer-reviewed research (*not* including those that do post-publication peer review, which *are* included); a few consisting of monographs or dissertations rather than articles; some journals offering exclusively government agency reports; and at least 40 journals that require registration in order to read articles. Many of these OA publications are worthwhile—but they aren't collections of refereed scholarly articles fully available immediately on publication.
- **Opaque:** I was unable to include 189 journals because the archives were too opaque to count the number of articles in each year without extensive effort. These include more than 50 journals offering only full-issue PDF downloads; roughly 100 journals where the archives did not show dates; and a number where either I couldn't *find* the archive, I couldn't make sense of it, or the archive was so convoluted that I gave up. There was also a couple that insisted on forcing ad windows whenever I took any action on the journal site or in the archive (in addition to at least three journal sites hosting malware, noted in the next section). Originally, there were 295 opaque journals. I checked them directly in *DOAJ* and was able to determine presumed article counts for 106 of them from that source.
- **Unreachable or unworkable:** 386 of the journal sites were unreachable or unworkable. That includes 144 journals where the URL in *DOAJ* yielded a 404 error message; more than 40 that are now parking pages, ad pages, or other things (such as nonroman blogs), including four entirely empty pages; some ten "journals" flagged by Firefox as malicious or that attempted to download malware to my computer; a dozen or so that opened multiple ad windows whenever I took any action; at least 50 with archives or main sites screwed up so badly that they were unusable; and more than 70 that were entirely unreachable (but not 404s) on at least two attempts over different days. That's about a 5 percent failure rate.

A note to readers of *Cites & Insights*: These exclusions may show different and, in at least one case, smaller numbers than the groupings in previous reports (where these would be groups *E*, *N*, *O*, and *X* respectively). That's because I was able to move some journals on further research and modified some criteria.

The bottom line is 6,490 journals that are accessible (at least to some extent) to English-language readers and were reachable on the web; that published at least one refereed scholarly article between January 1, 2011, and June 30, 2014; that publish refereed (peer-reviewed) scholarly articles; that make all such articles freely readable without registration or other impediments as soon as they're published; and that were possible to analyze by date of publication.

Table 1.1. Journals and articles by area

Area	Journals	No-Fee %	Articles	No-Fee %
Mega	4	0%	36,673	0%
Biomed	2,038	47%	128,035	34%
STEM	2,157	60%	141,224	33%
HSS	2,204	87%	52,903	70%
Misc	87	69%	7,375	38%
Total	**6,490**	**67%**	**366,210**	**36%**

Sideshows

Two other sets of OA journals show up in chapter 6, but not in most of this report.

I looked at some 8,000 journals based on Beall's 2014 lists. Of those, 6,948 are discussed in chapter 6, but only 3,256 actually published papers (and were countable) from January 1, 2011, through June 30, 2014.

Just over 400 journals from OASPA members weren't in *DOAJ* as of May 7, 2014. Of these, 308 published articles during the study period. (Quite a few were empty and canceled.) Those 308 published fewer than 6,000 articles in 2013.

Most Beall journals charged fees (as you'd expect: it's hard to be "predatory" if you're not charging anything); most of the 308 other OASPA journals did *not* charge fees.

The Big Picture

Here's the biggest picture, but as you'll see it's somewhat misleading. Of 6,490 gold OA journals publishing just over 366,000 articles in 2013, 67 percent of the journals were free for authors—but those journals published 36 percent of the articles. Theoretically, the journals that *did* charge fees could have taken in around $231 million in 2013, for an average of $1,045 for articles in fee-charging journals or $630 for all articles in 2013. In practice, fee-charging journals almost certainly took in less revenue, given waivers and discounts.

But there's not one big mass of OA journals, all more-or-less the same. There are distinct differences between large subject areas, and there's also extreme variety within each area.

As appropriate, this report deals with journals in three areas—with two small groups of journals handled separately. (The five are exclusive: a journal can be in only one of them.) The three major areas each have roughly the same number of OA journals (2,038 to 2,204); the two other groups (Megajournals and Miscellany) are *much* smaller.

- **Megajournals:** 4 journals each publishing more than 1,000 articles in 2013 (and typically more than 1,000 every year) that cover a wide variety of disciplines. Those four journals account for more than 10 percent of all articles published in 2013, and all charge fees of at least $1,000.
- **Biomed journals:** Those in all aspects of human biology and medicine. Biomed journals publish slightly fewer articles than STEM journals—but Biomed is the only area with a minority of free journals (47 percent), while the percentage of articles in free journals is roughly the same as for STEM (34 percent). This area has *by far* the most potential revenue and is the area in which the gold rush has been most evident.
- **STEM journals:** Those in science (other than human biology and medicine), technology, engineering, and mathematics. This area has the largest number of articles and the greatest disparity between free journals (60 percent) and articles in free journals (33 percent).
- **HSS journals:** Those in the humanities and social sciences. The largest number of journals, *by far* the smallest potential revenue of the three areas, and the area in which free publishing dominates both journals (87 percent) and articles (70 percent).
- **Miscellany:** 87 journals that either cross too many disciplines to fit into one of the three areas or that couldn't reasonably be assigned to one of them. Fewer than 7,400 articles, with a tiny amount of potential revenue.

Note that in tables and discussions the terms *free* and *no-fee* are interchangeable, as are *fee* and *APC*—and *free articles* means articles in journals that don't charge fees.

Table 1.1 shows the overall picture for articles published in 2013 and journals discussed in this study. (Of the journals that were free when checked but might impose APCs later, 161 are in Biomed, 139 in STEM, 26 in HSS, and three in Miscellany.)

Table 1.2 shows the *potential* revenue in each area—how much would have been taken in if every 2013 article resulted in the full APC or other charge. **$/Article (APC)** divides that amount by the number of articles in fee-charging journals, while **$/Article (All)** divides that amount by the total number of articles.

Table 1.2. Potential revenue by area

Area	Potential Revenue	$/Article (APC)	$/Article (all)
Mega	$49,637,565	$1,354	$1,354
Biomed	$114,440,937	$1,460	$894
STEM	$59,624,766	$681	$422
HSS	$6,419,931	$439	$121
Misc	$605,987	$176	$82
Total	**$230,729,186**	**$1,045**	**$630**

Note the huge differences here: Biomed articles overall cost more than twice as much as STEM articles, which in turn cost more than three times as much as HSS articles.

That's the big picture. The rest of this report fills it out and adds other measures, exploring the diversity of gold OA journals.

Acknowledgments

Thanks to Stephanie Willen Brown, Cameron Neylon, and John Dupuis for reviewing the draft of this report and offering great advice.

Chapter 2

Grades, Subject Groups, and Article Volume

The average OA journal published 57 articles in 2013 and charged $630 for each of them. That's obvious nonsense. So is this slightly refined pair: the average fee-charging journal published 107 articles and charged $1,045 for each one, while the average free journal published 31 articles (and charged nothing).

There's no such thing as an average journal, of course, any more than there's any such thing as an average library. How close can you come? Two fee-charging journals—both in Biomed—published 107 articles in 2013 and charged $800 and $738 respectively; 35 journals published 57 articles, 3 of those journals—two in STEM and one in Biomed—charging $600; 68 journals published 31 articles each, and 37 of those didn't charge fees.

Breaking journals down into various subgroups may help clarify the picture.

Grades

I am in no position to judge whether a journal meets the highest standards, especially in any field other than librarianship. Neither is anyone else in much more than their own discipline. So I'm not in a position to assign grades that are meaningful in that sense.

But it *is* reasonable to assign rough grades based on the visible nature of a journal's site: not whether a journal is guaranteed to be good, but whether there are signs that it's troublesome. I first assigned grades when looking at Beall's-list journals (most of which aren't actually journals) in the July 2014 *Cites & Insights*. I've carried those grades—slightly refined—over to this study. These are rough groupings and in no way override deeper investigation and common sense. If you've received e-mail inviting articles from a journal wholly outside your field, or one promising two-day turnaround for refereeing, or if a scholar skims half a dozen articles in a journal and finds one or two of them to be fringe or nonsense, that journal is a *C*: to be avoided. The roughness of these grades is one of several reasons I normally don't name journals or publishers in this report.

What are the grades and how are they defined?

- **A—Apparently good:** Nothing on the journal site raised red or yellow flags—and if there was a fee, it was clearly stated and not over $999.
- **A$—Good but pricey:** No apparent issues, but the APC is $1,000 or more.
- **B—May need investigation:** While the journal may be great, there was *something* about it that suggested an author might want to find out more, such as poor quality English in the interface or misleading (but not clearly false) claims or journal titles.
- **C—Highly questionable:** These journals have serious problems, and I believe most scholars and librarians would and should pass them by. I consider them red-flagged as compared to the yellow flag of *B* journals. Within *DOAJ*, the majority of *C* journals (61 percent) are assigned that grade because they almost certainly have APCs or other fees but don't say what they are. Other journals include clearly false statements by the publisher, boast such questionable things as two-day turnaround for peer review, or otherwise seem like scams. Note that only 294 of the 6,490 journals—less than 5 percent—fall into this category.
- **D—Dormant, diminutive, dying, or dead:** This group, which includes more than 1,000 journals, is complicated, as it includes several subcategories,

Table 2.1. Journals and articles by grade

Grade	Journals	% J	Articles	% A	A/J
A	3,976	61%	177,077	48%	45
Free	3,210	81%	114,094	64%	36
Pay	766	19%	62,983	36%	82
A$	580	9%	113,574	31%	196
Pay	580	100%	113,574	100%	196
B	567	9%	40,273	11%	71
Free	213	38%	8,419	21%	40
Pay	354	62%	31,854	79%	90
C	294	5%	25,284	7%	86
Free	17	6%	846	3%	50
Pay	100	34%	9,545	38%	95
Unknown	177	60%	14,893	59%	84
D	1,073	17%	10,002	3%	9
Free	790	74%	6,959	70%	9
Pay	264	25%	2,832	28%	11
Unknown	19	2%	211	2%	11

some of which are in this group because new *DOAJ* criteria mean that these journals may disappear from *DOAJ*. Note that *D* journals may be very high quality but require special attention if only because of their publishing patterns.

Here are the subcategories within *D*:

- C**—Ceased:** These 263 journals have either been explicitly canceled or merged with other journals (96 in all) or have had no articles appearing after 2012.
- **D—Dying:** These 93 journals show publication patterns that suggest they're on the verge of stopping publication. As a group, these journals published 1,226 articles in 2011; 1,299 in 2012; 533 in 2013—and 83 in the first half of 2014.
- **E—Erratic:** These 182 journals sometimes publish fewer than five articles in a year (the cutoff for *DOAJ* in the future) but publish many more in other years.
- **H—Hiatus:** These 145 journals didn't have any articles in the first half of 2014 (except for one or two that were *explicitly* on hiatus in late 2014) but have earlier publication patterns that suggest they're not dying but need editorial attention.
- **N—New:** These 16 journals either had a handful of articles in 2013 but none or one in the first half of 2014 or had exactly one in the first half of 2014 and none in earlier years.
- **S—Small:** The largest and in some ways the most interesting and confounding subcategory. These 374 journals have not published more than nine articles in any year later than 2010 and have published fewer than five in some years. Some of these are clearly niche journals, in fields so narrow (e.g., the works of a single philosopher) that four articles a year is a good showing; others just aren't making it as journals.

There's nothing inherently wrong with these journals—and I've suggested to *DOAJ* that the five-article requirement may not be entirely appropriate. As I suggested to them, "Maybe there's a need for a *Directory of Small Open Access Journals*?"

Table 2.1 shows the number of journals in each grade or group, the number of articles in those journals in 2013, and some related figures. The table may require a little explanation. **% J** and **% A** for grade/group lines (*A–D*) are the percentage of *all* journals or 2013 articles in that grade; for Free, Pay (that is, having APCs or other fees), and Unknown lines within a grade, they are the percentage of journals or articles for journals with that status. **A/J** is the average 2013 articles per journal.

It's good that *C* includes only 5 percent of the journals and 7 percent of the articles (see chapter 6 for a very different situation) and unsurprising that almost none of the *C* journals and articles are free. I find it encouraging that more than 60 percent of the journals in Table 2.1 had nothing obviously wrong with them and did *not* charge very high fees, even if those journals include slightly less than half of all OA articles in 2013.

The articles-per-journal breakdowns also follow predictable patterns: fee-charging journals tend to

Table 2.2. Journals and articles by area and grade

Area	Journals	% J	Articles	% A	A/J
Mega	4	0%	36,673	10%	9,168
A$	4	100%	36,673	100%	9,168
Biomed	2,038	31%	128,035	35%	63
A	1,082	53%	59,890	47%	55
A$	444	22%	48,422	38%	109
B	114	6%	7,793	6%	68
C	130	6%	9,094	7%	70
D	268	13%	2,836	2%	11
STEM	2,157	33%	141,224	39%	65
A	1,328	62%	73,336	52%	55
A$	113	5%	26,758	19%	237
B	288	13%	25,448	18%	88
C	124	6%	11,392	8%	92
D	304	14%	4,290	3%	14
HSS	2,204	34%	52,903	14%	24
A	1,515	69%	40,966	77%	27
A$	17	1%	1,647	3%	97
B	156	7%	5,993	11%	38
C	31	1%	1,530	3%	49
D	485	22%	2,767	5%	6
Misc	87	1%	7,375	2%	85
A	51	59%	2,885	39%	57
A$	2	2%	74	1%	37
B	9	10%	1,039	14%	115
C	9	10%	3,268	44%	363
D	16	18%	109	1%	7

publish a lot more articles than free journals, with the odd mix of *D* journals an exception.

In Table 2.2, **% J** and **% A** for area lines are the percentage of all journals and articles; those for grade lines are the percentage of journals and articles within that area—*not* the percentage of free journals or articles.

Subject Groups

While the three broad subject areas clarify some of the biggest differences among OA journals, they're very broad areas. Chapter 5 looks at journals split by some two dozen subjects for a few key measures, but that level of detail can be exhausting.

The subject groups discussed here—assigned, as are the chapter 5 subjects, on *DOAJ* subjects (and my own judgment)—may be a middle ground. Table 2.3 shows journals and articles for each group over four time periods: 2011, 2012, 2013, and the first half of 2014. The first line for each group shows journals that published at least one article during each period and the number of articles; the second shows the percentage of journals publishing in that year that are free to authors and the percentage of articles from those journals. Note that, while the article count for 2013 is the same as elsewhere, the journal count is lower (6,225 rather than 6,490). That's because other counts include *all* journals studied, some of which didn't publish articles in a given year. The lower journal count for 2014 is misleading: some OA journals post articles only once or twice each year and simply don't show up in the first half of the year.

A few brief notes on the subject groups and some of the more interesting figures in Table 2.3 follow, noting that the groups are in order by broad subject area (Biomed for the first two, STEM for the next four, HSS for the next two), with the two special groups following. Since all four megajournals charge fees, there's no *Free* line for **Mega**.

Table 2.3. Subject groups

	Journals				Articles			
Group	***2014*** *(Jan–June)*	***2013***	***2012***	***2011***	***2014****	***2013***	***2012***	***2011***
Biology	303	331	314	282	14,938	24,127	22,999	20,738
Free	37%	37%	38%	38%	19%	24%	23%	23%
Medicine	1,562	1,665	1,586	1,454	55,522	103,908	92,596	77,655
Free	48%	49%	49%	50%	33%	36%	40%	43%
Earth & Life	694	804	783	728	19,758	41,865	40,213	35,053
Free	59%	60%	61%	62%	39%	42%	42%	46%
Eng. & Tech.	334	371	348	294	15,985	29,024	22,365	14,939
Free	56%	57%	58%	60%	32%	34%	36%	49%
Math & Comp.	475	548	522	463	20,122	36,471	32,945	22,787
Free	60%	62%	63%	65%	26%	30%	31%	35%
Science	328	364	340	295	18,547	33,864	29,919	25,614
Free	53%	55%	54%	53%	23%	27%	29%	29%
Humanities	516	718	735	693	7,413	16,320	15,862	13,838
Free	93%	94%	95%	95%	75%	78%	81%	83%
Social Sciences	1,075	1,338	1,318	1,193	17,442	36,583	36,162	30,543
Free	81%	83%	84%	85%	59%	67%	68%	72%
Mega	4	4	4	4	21,168	36,673	26,512	15,523
Miscellany	67	82	75	58	5,385	7,375	5,788	2,585
Free	63%	67%	69%	74%	27%	38%	46%	71%
Total	5,348	6,225	6,025	5,464	196,280	366,210	325,361	259,275
Free	62%	64%	65%	67%	31%	36%	39%	43%

- **Biology:** This group, including all aspects of human biology, has the lowest percentage of free journals and articles of any subject group, but neither the percentages nor the volume have changed much since 2011—in contrast to the situation for non-*DOAJ* journals (see chapter 6).
- **Medicine:** This group, including all aspects of human medicine, has the most journals and the most articles of any group, and also the largest gain in *number* of journals from 2011 to 2013 (but not the largest percentage gain). While the percentage of free journals hasn't changed much (almost exactly half the journals), the percentage of articles published in free journals has dropped considerably while the number of articles grew by a third.
- **Earth and Life Sciences:** This group includes agriculture (and allied sciences), ecology and environmental topics, earth sciences (including geology and geography), and zoology (including veterinary medicine). This group has the second-highest percentage of free journals within the STEM area (around 60 percent) and the highest percentage of free articles within that area (more than 40 percent), with relatively little change in either percentage and only moderate growth.
- **Engineering and Technology:** Journals publishing articles grew by more than a quarter from 2011—but articles nearly doubled and seem likely to continue growing. The percentage of free journals declined only slightly, but the percentage of articles in those journals dropped substantially, from nearly half in 2011 to just over one-third in 2013; most article growth was in fee-charging journals.
- **Math and Computing:** This group, with modest growth in journals but fairly rapid growth in articles (60 percent more in 2013 than in 2011), is a little paradoxical: it has the highest percentage of free journals of any STEM area (more than 60 percent) and the second-*lowest* percentage of free articles (dropping from 35 percent to 30 percent).
- **Science:** This group includes chemistry, physics, "science" (usually multidisciplinary), and other hard-science areas not already mentioned. Most journals don't charge APCs—but the percentage of articles in free journals dropped to not much more than one-quarter by 2013, the lowest figure for any group other than Biology.
- **Humanities:** This group, including art and architecture, history, language and literature, media and communications, philosophy, and religion, is

Table 2.4. Journals by article volume

Peak	Journals	No-Fee %	Articles	No-Fee %
1,000+	26	8%	69,981	3%
600–999	47	11%	36,357	10%
400–599	59	12%	28,565	12%
200–399	230	25%	61,994	24%
100–199	496	41%	67,790	40%
60–99	707	50%	53,304	50%
35–59	1,145	63%	51,809	62%
20–34	1,520	74%	39,761	73%
1–20	2,260	78%	25,623	79%

Table 2.5. Journals by article volume for subject areas

Peak	Biomed	STEM	HSS
1,000+	7	12	3
Free	14%	0%	33%
200–999	137	164	25
Free	19%	21%	28%
60–199	556	477	159
Free	43%	47%	55%
20–59	888	903	845
Free	41%	30%	87%
1–19	450	601	1,172
Free	47%	72%	93%

slow-growing and continues to be predominantly free, with more than nine out of ten journals and at least three-quarters of articles *not* involving fees.

- **Social Sciences:** This group, including anthropology, economics and business, law, library science, political science, psychology, and sociology, includes the second-largest number of journals but the fourth-largest number of articles. Free journals (more than four out of five) and articles (at least two-thirds) also dominate here, but not as heavily as in Humanities.
- **Megajournals:** No change in the number of journals but *huge* growth in articles, with considerably more than twice as many articles in 2013 as in 2011, and every likelihood that 2014 will also show a (much smaller) jump. In one sense, there's only one true megajournal: *PLOS ONE* published more than 12 times as many articles in 2013 as the next most voluminous megajournal, *Scientific Reports*.
- **Miscellany:** So few journals and articles, with such a broad range of coverage, that no commentary is particularly useful.

Is it coincidental that the 2011 and 2013 percentages of articles from free journals are identical for Medicine and for the total field? Not entirely: Medicine is the largest area, with considerably more than a quarter of all articles.

Article Volume

You already know that journals (of whatever sort) vary widely in terms of article volume—all the way from annuals with a tiny handful of papers to weeklies with enormous quantities. Many online journals dispense with issues as such, offering a continuous stream of articles instead, but the ones I could evaluate at least make it possible to break down articles by year.

Table 2.4 shows the distribution of journals by peak volume (the year or half-year in which the largest number of articles appeared) and the number of 2013 articles in those journals—and the percentage of journals and articles that don't involve charges.

The significance of table 2.4 seems fairly clear. Most journals don't publish many articles, and the lower the volume, the more likely the journal is to be free. *Within* a size range (and apart from very high volume journals), free journals seem to publish roughly the same number of articles as paid journals: the two **No-Fee %** numbers are typically no more than 1 percent apart.

Table 2.5 uses a simplified set of peak volume ranges and shows the number of journals and percentage of free journals for each of the three broad areas. Note that less than half of Biomed journals are free at *any* article volume level, even though sparse journals come close—and that even in Humanities and Social Sciences, a majority of large and very large journals have fees. In STEM, free journals are in the majority only among sparse journals (those with fewer than 20 articles per year). Most sparse journals are in Humanities and Social Sciences; that may not be surprising.

These results (in tables 2.4 and 2.5) suggest a diseconomy of scale: it's much harder to maintain a high-volume journal with high standards without fees. Table 2.5 may suggest either that it's harder to maintain such a journal in Biomed and STEM or, reversing the correlation, that these fields are far more likely to have money available to pay APCs. I suspect both may be partly true.

A breakdown of article volume by the eight finer subject areas does not show particularly interesting differences from table 2.5 and is therefore omitted.

Chapter 3

Money Matters

Fees and Potential Revenues

Most gold OA journals (not quite two-thirds) are funded by societies, universities and colleges, libraries, governmental agencies, grant funding, subsumed and unstated costs, or other means. Some were free during the study period as a way of enticing more authors.

But roughly one-third of OA journals studied for this report *do* charge fees of some sort, paid out of research funding, through institutional agreements (including libraries), or by the authors. Most of those fees are forthrightly stated as article processing fees, and I use the abbreviation *APC* through most of this report to refer to all author-side fees. In some cases, the fee is actually a membership charge or is a submission fee rather than a fee for accepted articles, and a few journals charge for both submission and acceptance.

Just under 200 journals either clearly had APCs but failed to state the amount online or seemed highly likely to have such fees (my default assumption for journals *not* published by societies, academic institutions, government agencies, or libraries) but were silent on the matter. Those journals—all of them graded *C* and accounting for only 4 percent of the gold OA articles published in 2013—are not considered in this chapter, which deals only with the 2,064 fee-charging journals that explicitly state APC levels (which published a total of just under 221,000 articles in 2013).

What's appropriate for an APC? I've discussed that a little already, and my general answer is that it depends on what work is being done, the field in which it's being done, and many other factors. Some journals almost certainly don't charge enough to sustain continued high-quality work; some journals almost certainly charge more than can be justified strictly on the basis of costs. All I can do is show what's out there, not what's "right."

Assumptions

I recorded the APC or other fees as stated on the journal's website—ideally from a separate tab or link, but often as the first or last paragraph in author guidelines or publication notes. When fees were stated in some currency other than US dollars, I used the conversion rate at the point (typically in August–December 2014) that I looked at the journal. When fees were variable, I assumed fees for a full research article, written by a nonmember (if the journal had a society affiliation), from the United States (if the journal charged different fees for different countries), *not* allowing extra for color illustrations, and assuming a ten-page article (except in cases where the journal explicitly said that a different length was most common). Overall numbers—here and in other chapters—assume no waivers and are clearly too high in many cases.

Fee Levels and Ranges

The most expensive journal in *DOAJ* charges $5,000 per article. Three others charge more than $4,000, while a dozen more charge $3,000 to $3,900 per article.

At the other extreme, in addition to 4,230 journals that don't charge APCs at all, there are 4 journals charging $8 or $9, 6 more that charge $12 to $19, and 19 more that charge $20 to $29 per article.

Those are the extremes. Table 3.1 shows the broader range (including these extremes).

As with most tables in this report, the number of journals is all journals in groups *A*–*D*, including a few that may not have published articles in 2013, while the number of articles is the count for 2013. The **% J**

Table 3.1. Journals and articles by fee range

APC	Journals	% J	Articles	% A
$2,000+	241	12%	36,229	16%
$1,500–1,999	270	13%	22,230	10%
$1,000–1,500	171	8%	57,229	26%
$600–999	386	19%	19,653	9%
$450–599	133	6%	9,048	4%
$300–449	237	11%	20,378	9%
$200–299	139	7%	10,322	5%
$100–199	274	13%	26,526	12%
$50–99	140	7%	12,517	6%
$8–49	73	4%	6,656	3%
Total	2,064		220,788	

and **% A** columns show percentages of all fee-charging journals (and articles) respectively.

Table 3.1 has too many divisions to show for broad areas or subject groups, so I divided APC ranges by quartiles—that is, 25 percent of APC-charging journals in each range. Those ranges are: **Nominal**, $8 to $200; **Low**, $201 to $600; **Medium**, $601 to $1,450; and **High**, $1,451 or more.

Fee Ranges by Broad Area

Table 3.2 shows the number of fee-charging journals and 2013 articles in each broad area (and for Megajournals and Miscellany) split by APC range as noted above.

Area differences are fairly obvious. Biomed journals tend to have high APCs, HSS journals tend to have low or nominal APCs—and while most STEM journals have nominal or low APCs, those with medium APCs have disproportionately more articles.

In other words: not only are Biomed journals more likely to charge APCs, they're more likely to charge *high* APCs—and those few Humanities and Social Sciences journals that charge fees at all typically charge nominal or low fees.

For this particular measure, it may be enlightening to subdivide the three broad areas into eight subject groups. Table 3.3 does that.

Table 3.2. Fee ranges by area

Area	Nominal	Low	Medium	High
Mega			3	1
Articles			35,662	1,011
Biomed	125	165	239	457
Articles	10,218	9,655	14,029	44,509
STEM	277	272	192	51
Articles	29,580	24,576	21,433	12,030
HSS	130	86	41	4
Articles	7,377	4,564	1,543	1,155
Misc	13	4	3	1
Articles	3,097	233	51	65

Table 3.3. Fee ranges by subject group

Group	Nominal	Low	Medium	High
Biology	19	44	35	94
Articles	1,316	1,865	2,597	12,024
Medicine	106	121	204	363
Articles	8,902	7,790	11,432	32,485
Earth & Life	93	103	76	23
Articles	5,471	9,387	6,403	1,831
Eng. & Tech.	48	56	34	10
Articles	9,573	4,000	1,836	2,252
Math & Comp.	91	67	32	5
Articles	9,177	8,142	6,631	719
Sciences	45	46	50	13
Articles	5,359	3,047	6,563	7,228
Humanities	17	16	6	
Articles	1,582	1,579	300	
Social Sciences	113	70	35	4
Articles	5,795	2,985	1,243	1,155

A couple of noteworthy items here: there are *no* Humanities journals with high APCs and very few with medium APCs, and Medicine has many more high-APC journals than all other subject groups put together. There's more here, but I'll leave further analysis to the reader.

Chapter 4

Starting Dates and the Gold Rush

While OA journals born as OA journals date back to around 1987, journals that are now OA go back much further, with *DOAJ* listings dating back to 1853. Still, most OA journals began fairly recently, and there's been an enormous increase in OA publishing in recent years. There's some reason to believe that part of that increase, at least in some fields, may be due to a growth in available funding for APCs—that there may be a sort of gold rush going on. (There's a secondary gold rush of pseudo-journals from "publishers" hoping to get in on the action, discussed in chapter 6.)

Overall Patterns

Journals founded in the twentieth century that are now gold OA journals mostly do *not* charge APCs; except for the 27 journals founded during the 1960s, free journals consistently represent at least three-quarters of early OA journals.

But that's also true for journals in the first six years of the new century, with fewer than 20 percent of new OA journals charging fees. While there's no good way to know for sure, my guess is that most journals founded prior to, say, 1996 began as print journals and converted to OA more recently—whereas a growing number of journals founded since then *began* as OA electronic-only journals.

Table 4.1 shows the number of journals and percentage of those journals that don't charge APCs by starting date. The six journals founded in 2014 that were in *DOAJ* by May 2014 and had articles in the first half of the year are omitted from table 4.1 and the rest of this chapter; half of them charge APCs.

Table 4.1. Starting dates for OA journals

Year	Total	Free %
Pre-1960	44	77%
1960–69	27	59%
1970–79	47	89%
1980–89	100	75%
1990–91	36	78%
1992–93	50	90%
1994–95	89	80%
1996–97	195	84%
1998–99	223	89%
2000–01	347	83%
2002–03	439	83%
2004–05	491	80%
2006–07	705	69%
2008–09	1,000	61%
2010–11	1,800	51%
2012–13	891	54%

Before preparing this chapter, I believed that the gold rush began around 2010—and that may be true for the journals and "journals" that are *not* in *DOAJ*. But for *DOAJ* listings, table 4.1 suggests that the gold rush began in 2006–2007, the first period during which more than 25 percent of new OA journals charged fees. The percentage of free journals drops sharply from 2006 through 2010, with 2008–2009 and 2010–2011 being the only two-year periods in which more than a thousand new OA journals emerged. While it's a little early to say, the sharp

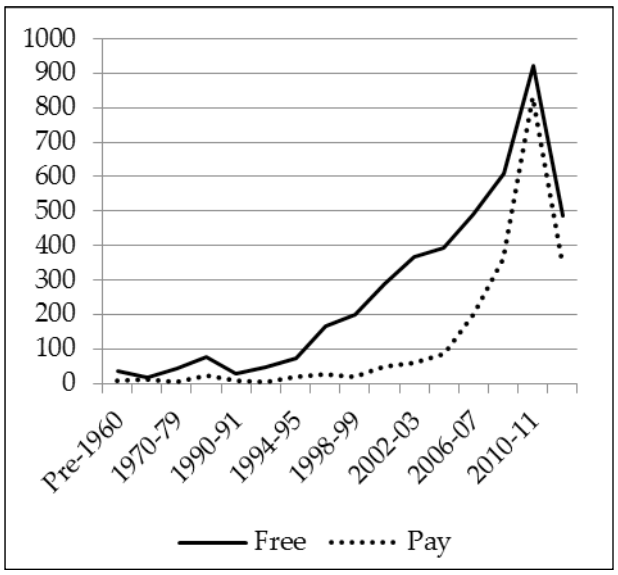

Figure 4.1
OA journals by starting date

Table 4.2. Articles per journal by starting date

Year	Journals	Articles	Art/J
Pre-1960	42	3,787	90
1960–69	27	1,859	69
1970–79	46	2,400	52
1980–89	96	5,743	60
1990–91	36	2,042	57
1992–93	47	2,971	63
1994–95	87	5,040	58
1996–97	187	14,288	76
1998–99	216	12,149	56
2000–01	335	19,056	57
2002–03	414	52,552	127
2004–05	459	24,870	54
2006–07	673	34,165	51
2008–09	941	41,160	44
2010–11	1,735	104,312	60
2012–13	884	39,816	45

decline in the number of new journals in 2012–2013 and the small increase in free percentage may suggest that the mixed side of the gold rush—that is, cases where the journals meet the standards of *DOAJ*—may be ending.

Figure 4.1 tracks free and pay (APC-charging) OA journals by starting date. While new free OA journals rise throughout the 1990s and somewhat more sharply since 2006, it's noteworthy that pay journals—near the bottom of the graph through 2004–2005—rise *very* rapidly through 2010–2011.

Table 4.3. Starting dates by subject area

Year	Biomed	STEM	HSS
Pre-1960	21	17	4
1960–69	13	7	7
1970–79	12	18	17
1980–89	30	35	35
1990–91	6	14	16
1992–93	9	16	25
1994–95	28	28	33
1996–97	46	60	87
1998–99	55	77	89
2000–01	88	109	148
2002–03	111	155	169
2004–05	110	148	226
2006–07	197	234	267
2008–09	317	320	349
2010–11	713	579	485
2012–13	279	338	246

Table 4.2 shows 2013 articles by period in which journals started and the average number of 2013 articles per journal for each starting period. The number of journals for each period is typically lower than in table 4.1 because some journals didn't publish articles in 2013.

The high article-per-journal ratio for journals founded in 2002–03 is a mystery (*PLOS ONE* came later); with that exception, overall articles per journal don't vary all that much from 1960 on.

Finer analysis (free vs. pay, subject-based) might yield some correlations, but that level of detail is outside the scope of this report. (See chapter 8: the anonymized dataset would be suitable for such analysis.)

Subject Areas

As you start to break down journals by subject area, the sense of an overall gold rush becomes something else: a combination of overall rapid growth in gold OA publishing beginning in 2006 and a gold rush in APC-charging journals that's most obvious in Biomed and somewhat less pronounced in STEM.

Table 4.3 breaks down starting dates by subject area (ignoring Megajournals and Miscellany), and it's clear that growth is fairly rapid across the board starting in 2000, becoming much more rapid in 2006–2007, then dropping off somewhat in 2012–2013. The table also shows something I find interesting: there were *more* new OA journals in the Humanities and Social Sciences than in STEM or Biomed from 1990 through 2008—but Humanities and Social Sciences

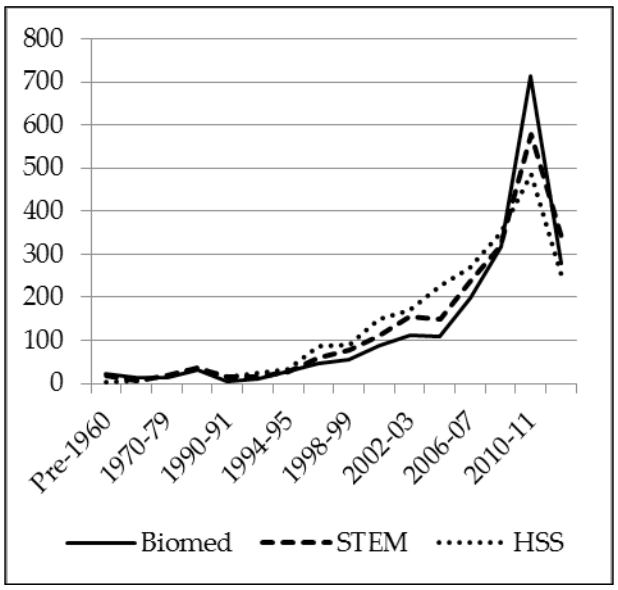

Figure 4.2
Starting dates by subject area

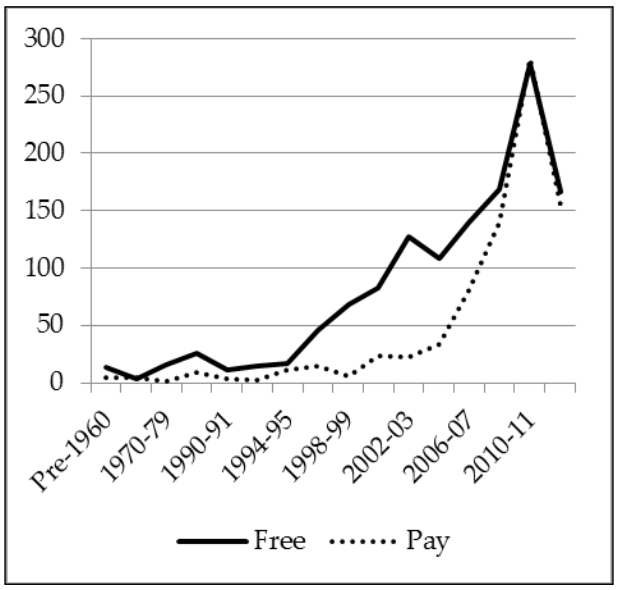

Figure 4.4
STEM journal starting dates

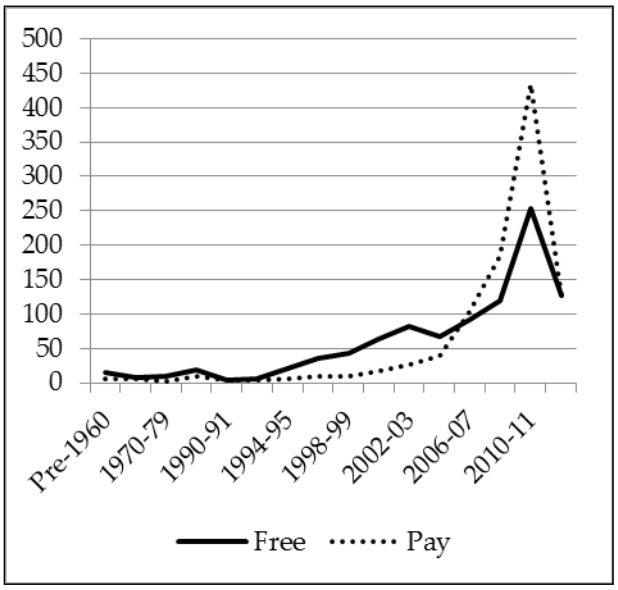

Figure 4.3
Biomed journal starting dates

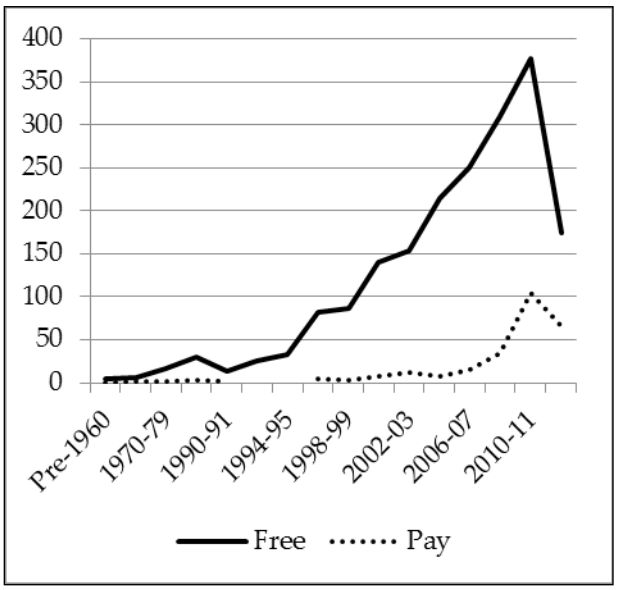

Figure 4.5
HSS journal starting dates

fall behind since then. Figure 4.2 shows the same data in the form of a graph.

While the three lines in figure 4.2 seem roughly similar, that similarity breaks down when you look at free and APC-charging journals.

Figure 4.3 shows free and pay (APC-charging) journals in Biomed by decade or two-year period, and the picture is fairly obvious: although free journals continued to emerge, they're dominated by APC-charging journals from 2006–2007 through 2010–2011, dramatically so in 2010–2011.

As figure 4.4 shows, the balance is significantly different for STEM journals. Although large numbers of fee-charging journals start emerging in 2006, free journals also proliferate enough to at least keep up with the fee-charging journals.

Finally, there's Humanities and Social Sciences, shown in figure 4.5. While there are certainly more new APC-charging journals founded beginning in 2006, they're far outnumbered by new free journals.

Is it fair to categorize the situation in Biomed as a gold rush? I'm not sure—but it's clear that the pattern

of new Biomed journals is sharply different from other fields, even as other fields participate in the booming growth of new OA journals.

Age and Grades

Are there interesting correlations between journal age and journal grade? Maybe, although so few *DOAJ* journals merit a *C* that it's stretching a point.

For *A* journals (free and with APCs under $1,000), 34 percent started before 2005, 29 percent from 2005 to 2009, and 37 percent from 2010 to 2014. But for *A$* journals, the percentages are 11 percent pre-2004, 26 percent 2005–2009, and 62 percent 2010–2014. Oddly enough, the percentages are almost identical for *B* journals: 11 percent, 22 percent, and 67 percent respectively. Finally, for the few *C* journals, 17 percent started before 2005, 33 percent 2005–2009, and 50 percent 2010–2014. In terms of a possible gold rush, I believe the *A$* percentages are most telling.

Chapter 5

A Closer Look at Subjects

Before moving on to sideshows and leftovers, it may be interesting to look at narrower subject areas. As with the broad areas and subject groups, these assignments rely on my interpretation of the subjects in *DOAJ* itself and, in some cases, on my interpretation of a journal's title. I lack the expertise to divide Biology or Medicine into a reasonable number of smaller subjects, so I didn't attempt to do so.

Subject Snapshots

Tables showing 28 subject areas are inherently *big*, and even bigger—perhaps unworkably so—if the subject areas are grouped by broad areas and subject groups. To make this discussion more coherent, I'll show 2011–2014 publishing patterns for one broad area and its subjects at a time, following each broad area's table with a discussion of what the subject areas include and especially noteworthy aspects of the area. I include Miscellany and Megajournals along with Biomed since these are the areas that don't have narrower subjects. In looking at 2011–2014 figures, remember that 2014 includes only half a year, and much less than that for journals that appear only once a year (or have somewhat slow online processing). The number of journals for each year is the number of journals *that published articles that year*, usually lower than the overall number of journals.

Biomed, Miscellany, and Megajournals

Table 5.1 shows journals and articles in Biomed, Miscellany, and Megajournals.

Miscellany includes journals so broadly defined as to include most anything (including, for example, student research journals and some interdisciplinary journals) and some fields that I couldn't find a place for. It includes some but not all journals called "general works" in *DOAJ*. Any noteworthy aspects may not be meaningful, but this group averaged very low APCs ($82 per article) even though the percentage of

Table 5.1. Biomed, Megajournals, and Miscellany, year by year

Subject	**2014** (Jan–June)	**2013**	**2012**	**2011**
Miscellany	67	82	75	58
Articles	5,385	7,375	5,788	2,585
Megajournals	4	4	4	4
Articles	21,168	36,673	26,512	15,523
Biomed	1,855	1,996	1,900	1,736
Articles	70,460	128,035	115,595	98,393
Biology	303	331	314	282
Articles	14,938	24,127	22,999	20,738
Medicine	1,552	1,665	1,586	1,454
Articles	55,522	103,908	92,596	77,655

Table 5.2. STEM, year by year

Subject	**2014** (Jan–June)	**2013**	**2012**	**2011**
Earth & Life	694	804	783	728
Articles	19,758	41,865	40,213	35,053
Agriculture	264	298	290	268
Articles	7,471	16,880	15,209	13,622
Earth Sciences	155	182	181	173
Articles	3,598	7,109	6,245	5,423
Ecology	128	151	144	129
Articles	4,015	8,295	7,646	6,615
Zoology	147	173	168	158
Articles	4,674	9,581	11,113	9,393
Engin. & Tech.	334	371	348	294
Articles	15,985	29,024	22,365	14,939
Engineering	221	240	218	186
Articles	11,163	19,336	14,024	9,332
Technology	113	131	130	108
Articles	4,822	9,688	8,341	5,607
Math & Comp.	475	548	522	463
Articles	20,122	36,471	32,945	22,787
Computer Science	281	328	315	272
Articles	11,508	23,281	21,114	13,722
Mathematics	194	220	207	191
Articles	8,614	13,190	11,831	9,065
Science	328	364	340	295
Articles	18,547	33,864	29,919	25,614
Chemistry	121	131	119	102
Articles	6,297	12,258	11,444	9,244
Physics	111	122	115	105
Articles	5,863	10,509	10,101	9,634
Other Sciences	96	111	106	88
Articles	6,387	11,097	8,374	6,736
Total STEM	1,831	2,087	1,993	1,780
Articles	74,412	141,224	125,442	98,393

articles in free journals is the lowest outside of HSS subjects.

Megajournals are journals that publish in a wide variety of fields and had more than 1,000 articles in at least one of the four years. (There are other journals publishing more than 1,000 papers a year that fit within a narrower subject—and there are would-be megajournals that haven't achieved huge volume yet.)

Biology includes most everything that has *bio* as a leading part of its topic. These journals have the second-highest average cost per article in 2013 ($1,228); while it's the third-highest total 2013 article count, that count was less than one-quarter of Medicine (but two-thirds of Megajournals). Only 38 percent of OA Biology journals are free, by far the lowest percentage of any subject, and only 24 percent of 2013 articles appeared in the no-fee journals (but that's not *quite* the lowest percentage).

Medicine includes aspects of *human* health and exercise, including some aspects of nutrition. While the average cost per article ($816) is also considerably higher than the overall average—which it helps to define, with 28 percent of all 2013 articles—it's a little lower than Physics. Medicine includes more than four times as many articles as the next-highest specific area (Biology). It has the second-lowest percentage of free journals, but that's still very nearly half (49 percent), and at 36 percent, the percentage of

2013 articles in free journals is precisely average (and largely determines the average) and higher than six specific subjects.

Science, Technology, Engineering, and Mathematics

Table 5.2 shows STEM journals and articles.

Agriculture includes aquaculture, fisheries, and other aspects of raising and processing plants and animals, including food and some aspects of nutrition. The average cost per 2013 article ($336) is relatively low for STEM; the number of articles is third-highest for STEM. Percentages of free journals (58 percent) and articles (44 percent) are about midrange for STEM.

Earth Sciences include geography, geology, oceanography, some related fields—and astronomy. At $406, average cost per 2013 article is middling, and there are fewer articles in this mixed group than in any other STEM area. A high percentage of journals than is typical for STEM (73 percent) didn't charge fees in 2013, and nearly half of the articles (46 percent) appeared in those journals.

Ecology includes environmental fields. Average charges are a bit lower than Earth Sciences ($407), and there are more articles. The percentage of free journals is low (53 percent); the percentage of articles in those journals is *very* low (27 percent), fifth-lowest of any area.

Zoology includes veterinary medicine as well as marine biology.

Engineering journals were distinguished from Technology journals based on narrower subjects and journal titles. The distinction is fuzzy at best, with most questionable cases being assigned to Engineering. This area has the second-lowest average cost per article ($252) outside of HSS and the fourth-largest article volume of any subject in 2013. The percentage of free journals is relatively low (57 percent), and the percentage of 2013 articles in those journals is *very* low (26 percent). Notably, 40 journals with modest APCs account for nearly half of all articles in 2013.

Technology journals are, as noted in the preceding paragraph, a somewhat fuzzy group. It's a smaller group with somewhat higher fees (average $353 per 2013 article) and middling percentages of free journals (59 percent) and articles (49 percent).

Computer Science includes software, data processing, AI, robotics, and portions of what might be considered information science. This area has the lowest average cost per article ($241) of any subject outside of HSS—and the largest article volume of any STEM subject. The percentage of free journals is low (53 percent) and the percentage of articles in those journals is *extremely* low (24 percent). Of the many journals with modest APCs, 22 (with APCs between $50 and $250) with more than 100 articles each in 2013 account for more than 8,300 articles, more than a third of the total.

Mathematics includes statistics. The average cost per article ($508) is slightly lower than the overall average for this medium-sized group (fourth-largest volume among STEM subjects). There are a *lot* of no-fee Math journals; at 79 percent, it's the highest percentage outside HSS, although only 40 percent of 2013 articles appeared in no-fee journals.

Chemistry as a subject doesn't seem to require much clarification (noting that most biochem ended up in Biology). It's an expensive area ($713, second-highest in STEM) with medium volume (fifth-largest in STEM). A fairly typical (for STEM) 59 percent of journals are free, and those journals publish a fairly typical (for STEM) 30 percent of 2013 articles.

Physics includes optics. I had naively assumed that the success of ar×iv would mean that average price per article for Physics would be relatively low, but it's actually the highest ($870) of any STEM subject. Volume is middling; percentage of no-fee journals (53 percent) is low; at 31 percent, percentage of 2013 articles in no-fee journals is typical of STEM.

Other Sciences includes journals that cover many different sciences, including interdisciplinary journals that appear science-focused and attempts at mega-journals that haven't achieved high volumes. Cost per article is average ($586) and volume is middling, but the percentage of no-fee journals (51 percent) is the lowest of any subject outside of Biomed—and the percentage of 2013 articles in those journals (21 percent) is the lowest of *any* subject.

Humanities and Social Sciences

Table 5.3 shows journals and articles in the Humanities and Social Sciences. Relative to overall article volume, the breakdown here is unusually precise, but HSS covers a huge range of human endeavor and publishing. Most of these subjects have very low cost per article, fairly light volume, and very high percentages of free journals and articles.

Arts and Architecture includes most areas I'd consider to be in the fine arts (there are very few OA architecture journals). Fourth-lowest cost per article ($17); tied for second-highest percentage of free journals (95 percent) and for fifth-highest percentage of 2013 articles from free journals (84 percent).

History includes most aspects of cultural research focused on the past. The lowest cost per article ($10) and medium volume for HSS, this topic has the highest free-journal percentage (98 percent—only three fee-charging journals, one of the three actually requiring membership and one that could belong in medicine) and article percentage (also 98 percent).

Table 5.3. HSS, year by year

Subject	**2014** (Jan-June)	**2013**	**2012**	**2011**
Humanities	515	718	735	693
Articles	7,410	16,320	15,862	13,838
Arts & Architecture	103	130	144	135
Articles	1,191	2,647	2,742	2,275
History	87	126	123	116
Articles	1,308	2,739	2,927	2,721
Language & Literature	169	240	248	229
Articles	2,853	6,243	5,802	4,862
Media & Communications	56	75	72	68
Articles	914	1,667	1,378	1,207
Philosophy	56	85	84	84
Articles	466	1,409	1,438	1,266
Religion	45	61	63	60
Articles	678	1,603	1,555	1,493
Social Sciences	1,075	1,338	1,318	1,193
Articles	17,442	36,583	36,162	30,543
Anthropology	89	125	125	111
Articles	1,285	2,663	2,753	2,383
Economics	267	325	314	277
Articles	4,983	10,663	12,159	10,413
Education	256	306	298	269
Articles	3,422	7,332	7,243	6,047
Law	75	103	98	94
Articles	915	2,019	1,633	1,578
Library Science	61	72	75	71
Articles	644	1,363	1,433	1,304
Political Science	97	122	123	110
Articles	1,096	2,402	2,218	1,989
Psychology	62	71	69	64
Articles	1,539	2,926	2,320	1,952
Sociology	168	215	217	198
Articles	3,558	7,227	6,423	4,891
HSS Total	1,591	2,056	2,053	1,886
Articles	24,855	52,903	52,024	44,381

Language and Literature includes linguistics and a number of other fields, as well as author-specific journals and the like. The third-largest set of journals and articles in HSS. The average article charge ($62) is low but middling for HSS. Very high free-journal percentage (95 percent), but a relatively low percentage of articles (73 percent) in those journals.

Media and Communications includes film, performance, communication theory, and some related fields. Relatively high average article charge ($105) and modest volume. Decent free journal percentage (91 percent), but a relatively low percentage of articles (73 percent) in those journals.

Philosophy includes journals on specific philosophers and philosophies. It's another smallish group with middling price-per-article ($65). Very high free-journal percentage (95 percent) and high free-article percentage (90 percent).

Religion includes journals on specific religions (and religious figures) and aspects of religion or non-religion. Another small group (fewer journals but more articles than philosophy) that could plausibly

Table 5.4. Journals and articles by subject

Subject	Journals	% No-fee	Articles (2013)	% No-fee
Agriculture	309	58%	16,880	44%
Anthropology	132	86%	2,663	77%
Arts & Architecture	150	95%	2,647	84%
Biology	336	38%	24,127	24%
Chemistry	136	59%	12,258	30%
Computer Science	338	53%	23,281	24%
Earth Sciences	189	73%	7,109	46%
Ecology	153	53%	8,295	27%
Economics	345	69%	10,663	50%
Education	319	88%	7,332	80%
Engineering	245	57%	19,336	26%
History	136	98%	2,739	98%
Language & Literature	262	95%	6,243	73%
Law	106	95%	2,019	93%
Library Science	77	94%	1,363	92%
Mathematics	228	79%	13,190	40%
Media & Communications	79	91%	1,667	73%
Medicine	1,702	49%	103,908	36%
Miscellany	87	69%	7,375	38%
Philosophy	96	95%	1,409	90%
Physics	125	53%	10,509	31%
Political Science	129	91%	2,402	84%
Psychology	74	76%	2,926	52%
Religion	65	88%	1,603	47%
Other Sciences	118	51%	11,097	21%
Sociology	234	83%	7,227	63%
Technology	138	59%	9,688	49%
Zoology	178	57%	9,581	47%
Total	**6,490**	**65%**	**366,210**	**36%**

be combined with philosophy—except that religion shows *much* higher costs per article ($184, highest in the Humanities), considerably lower free-journal percentage (88 percent), and by far the lowest percentage of articles in free journals of any HSS subject, 47 percent, the only HSS subject below 50 percent.

Anthropology includes archæology and sports science. Middling average article cost ($110) and modest article volume are coupled with a moderately low free-journal percentage (86 percent) and middling free-article percentage (77 percent).

Economics includes most business topics. It's the largest set of journals and by far the largest article volume in HSS, with an average article cost ($122) higher than any other HSS subject. The lowest HSS percentage of free journals (69 percent) and second-lowest percentage of articles within those journals (50 percent).

Education is the second-largest set of journals and articles, and I could have tagged a number of STEM journals here. At $58, average cost per article is relatively low. Middling percentage of free journals (88 percent), strong percentage of articles from those journals (80 percent).

Law includes forensics. I didn't calculate average articles per journal by subject, but Law is certainly a contender for sparsest journals (Law articles tend to be long). Third-lowest average cost per article ($17), tied for second among highest percentage of free journals (95 percent), second-highest percentage (93 percent) of articles in free journals. (Note that until I added 2,200 mostly non-English journals to the dataset, there were *no* law journals with APCs.)

Library Science includes bibliography, archives and museums, and some aspects of information

Table 5.5. Average 2013 cost per article

Subject	$/Article	Articles
Megajournals	$1,353.52	36,673
Biology	$1,227.94	24,127
Physics	$869.79	10,509
Medicine	$816.25	103,908
Psychology	$811.77	2,926
Chemistry	$713.13	12,258
Total	**$630.05**	**366,210**
Other Sciences	$585.92	11,097
Mathematics	$508.05	13,190
Ecology	$420.43	8,295
Earth Sciences	$406.95	7,109
Technology	$352.59	9,688
Agriculture	$336.41	16,880
Zoology	$269.20	9,581
Engineering	$252.39	19,336
Computer Science	$240.76	23,281
Religion	$183.95	1,603
Economics	$121.84	10,663
Sociology	$121.73	7,227
Anthropology	$109.62	2,663
Media & Communications	$105.40	1,667
Miscellany	$82.17	7,375
Philosophy	$65.24	1,409
Language & Literature	$61.80	6,243
Education	$58.09	7,332
Political Science	$32.68	2,402
Arts & Architecture	$17.33	2,647
Law	$16.63	2,019
Library Science	$10.29	1,363
History	$10.09	2,739

science (that did not appear to be based on computer science). A smallish set of journals and the lowest article volume of any subject; second-lowest average article cost ($10.29, where History is $10.09), with high free-journal percentage (94 percent), and the third-highest free-article percentage (92 percent).

Political Science includes military and defense topics and most governmental affairs areas. Relatively few journals and articles, a low average article cost ($33), a free-journal percentage that's typical for HSS (91 percent), and a very high free-article percentage (90 percent).

Psychology includes relatively few journals and articles, but the $812 average cost per article is more than four times as high as the next-highest HSS subject, more in line with Medicine. (You could make the case for lumping Psychology in with Medicine.) A low percentage of free journals for HSS (76 percent) and the third-lowest free-article percentage for HSS (52 percent).

Sociology includes a range of social sciences that didn't fit elsewhere. It's the third-largest group of journals and articles in HSS, with an average article cost essentially the same as Economics ($121.73 for Sociology, $121.84 for Economics). Somewhat low free-journal percentage for HSS (83 percent) and the fourth-lowest free-article percentage for HSS (63 percent).

Overall Tables

Those are the snapshots. For readers who are comfortable with tabular information, table 5.4 shows, for each subject, journals in that subject, the number of 2013 articles, and the free percentage for both numbers. (Note that journal numbers will generally be higher than the 2013 column of tables 5.1–5.3.) Table 5.5 shows the average 2013 cost per article (total potential revenue divided by total articles including articles in free journals), arranged by decreasing average cost.

Sideshows and Leftovers

Does *DOAJ* represent the universe of OA journals? Not entirely. There are certainly more than 1,000 OA journals that are *not* in *DOAJ*—and more than 7,000 journal names that aren't represented in *DOAJ*.

OA journals that I encountered but that aren't in *DOAJ* may be missing for one or more of several reasons:

- They're brand-new, and the publisher is waiting until a couple of issues are published before submitting them to *DOAJ*.
- They don't meet *DOAJ* criteria for inclusion—a situation that's much more likely in the future, given tighter criteria for inclusion.
- They're not actual OA journals publishing actual peer-reviewed scholarly articles at all: they're something else, most commonly "journals." I define "journals" with scare quotes as web pages that purport to identify and describe journals, where there is no operational journal behind the web page.
- The publisher chose not to submit them to *DOAJ*.
- The publishing body isn't aware that *DOAJ* exists.

The title of this chapter suggests two ways to look at non-*DOAJ* gold open-access journals: as sideshows—things that aren't serious OA journals at all—and as leftovers—journals that aren't or aren't yet part of *DOAJ*.

My sense is that there are, at most, a few hundred leftovers, most of which are likely to show up in *DOAJ* unless they disappear. The examples here are some 401 journal names from OASPA members that, as of May 7, 2014, either weren't in *DOAJ* or couldn't be identified as being in *DOAJ,* and 8,000 or more entities—journals and "journals"—that are either on Jeffrey Beall's list of "predatory" journals or published by one of his long list of "predatory" publishers. I think of the OASPA group as leftovers and of Beall's lists and most of the entities in them as sideshows.

OASPA Leftovers

As of the spring of 2014, OASPA member sites listed 1,531 journals. Of these, all but 401 are in *DOAJ* and are included in the discussion so far. Here's what I found among the other 401:

- **Almost New:** 112 began in 2013, but have had so few articles to date that the publishers may not yet have submitted them to *DOAJ*.
- **Empty:** 69, most of them explicitly ceased.
- **New:** 66 began in 2014 and will probably show up in *DOAJ* later.
- **New or Empty:** 41 journals in a single series of similarly named journals either started in 2014 or are essentially empty (in some cases explicitly ceased).
- **Sparse:** 30 began before 2013 but have never achieved five articles in any year; the publishers may not have submitted them (and they wouldn't be eligible under current criteria).
- **Unworkable:** Nine couldn't be evaluated, one because it yielded 404 errors, eight because the archives appear to be random.
- **Ceased:** Two others have explicitly ceased.

That leaves 73 journals, all of which are in grades *A*, *B*, *DE* (erratic), or *DS* (sparse). Four of those are miscellaneous. Of the others:

- Biomed includes 35 journals (9 percent free) with 3,694 articles in 2013 (1 percent free).
- STEM includes 8 journals (50 percent free) with 557 articles in 2013 (22 percent free).
- HSS includes 26 journals (73 percent free) with 274 articles in 2013 (75 percent free).

Inclusion of these journals would add almost nothing to STEM or HSS and would add only 1.7 percent more journals and 2.9 percent more articles to Biomed. I'd assume most of these will disappear or be added to *DOAJ*. I don't think they'd change the picture very much.

Beall's Lists Sideshow

Before I began looking at the full range of open-access journals, I investigated the 2014 versions of Jeffrey Beall's list of "potential, possible, or probable predatory scholarly open-access publishers" and his list of "potential, possible, or probable predatory scholarly open-access journals" that aren't from those publishers.

Beall's 2014 lists
http://scholarlyoa.com/2014/01/02/list-of-predatory-publishers-2014

The results of that investigation were published as "Journals, 'Journals' and Wannabes: Investigating the List," in the July 2014 issue of *Cites & Insights*. I found that the lists expanded to 9,219 "journals"—but that thousands of these "journals" deserved the scare quotes: more than 2,800 had never published a single article, and more than 500 weren't reachable at all. You'll find more about these journals and "journals" in the October/November 2014 *Cites & Insights*, a follow-up of sorts to the July issue.

Cites & Insights, July 2014
http://citesandinsights.info/civ14i7.pdf

Cites & Insights, October/November 2014
http://citesandinsights.info/civ14i10.pdf

After reviewing more of Jeffrey Beall's writings on serials and open access, I conclude that Beall's list is not a meaningful resource. It is a subjective sideshow maintained by somebody who's made it clear that he's opposed to open access in general. Rather than link to particular articles, I'll suggest the April 2014 issue of *Cites & Insights*, specifically the first fourteen pages: "Ethics and Access 1: The Sad Case of Jeffrey Beall." That essay refers and links to Beall's article "The Open-Access Movement Is Not Really about Open Access," and you should also read "Reactionary Rhetoric against Open Access Publishing" by Wayne Bivens-Tatum, a direct response to Beall's article, published in the same journal.

Cites & Insights, April 2014
http://citesandinsights.info/civ14i4.pdf

"Reactionary Rhetoric against Open Access Publishing"
http://triple-c.at/index.php/tripleC/article/view/617

Less than 10 percent of the "journals" from Beall's lists were also in *DOAJ* as of mid-2014—and less than 10 percent of *DOAJ* entries were on Beall's set of questionable publishers and journals. I have no doubt there are some good-quality journals and publishers in Beall's set—just as I have no doubt there are questionable journals not only in Beall's set but among subscription journals.

Realistically, your best bet—for authors, readers, and librarians—is to begin with *DOAJ* and assume that *any* OA journal not included there is somewhat questionable, with exceptions noted in chapter 7.

Just Not Much There

Once you eliminate from the Beall subset journals that aren't reachable, journals that have never published anything, journals that aren't open access *at all*, journals that are dying or dead, and the large numbers of journals that are *obviously* questionable to an intelligent author or reader—those with grade *C*—there's just not much left.

A few key figures:

- Of journals checked in *DOAJ*, 70 percent are plausible prospects (grades *A*, *A$*, and *B*). Of journals checked in the Beall set that are *not* also in *DOAJ*, 14 percent are plausible prospects.
- Looking at journals with decent grades that have managed to publish 20 or more articles in at least one recent year—not a terribly high bar—you'll find 3,714 such journals in the portion of *DOAJ* I investigated—and 474 in the Beall set. That's a 7.8 to 1 ratio.

Including journals with grades *A*, *A$*, and *B* but with fewer articles, we arrive at figures for journal count and 2013 article counts (and the percentage of free journals and articles in those journals) shown in table 6.1.

The **Ratio** row shows the result of dividing the *DOAJ* figure by the Beall figure. In other words, there are 4.4 times as many *A*, *A$*, and *B* journals in the tested subset of *DOAJ* as in the Beall set (excluding overlap)—and 8.6 times as many 2013 articles.

A Few Other Facts and Figures

In my full examination of OA journals, with detailed article counts and including 2011 and the first half of 2014, I visited 6,498 journals and "journals" in Beall's set that weren't also in *DOAJ*—skipping more than a thousand that yielded 404s on the first try or were too difficult to retry (mostly because publishers didn't offer downloadable lists with hyperlinks). Of that 6,498, I found that 11 percent (753) were unreachable; 6 percent (413) didn't meet my definition of OA; 3 percent (263) were hybrid journals with no apparent OA articles; 30 percent (2,045) were just names with no published articles whatsoever; and 279 were too opaque to analyze. The rest of these notes are based on the remaining 3,275 journals, of which I found 1,206 in *D* subcategories, 916 obviously questionable (*C*), 874 that require further checking (*B*), and 279 that appear to be good (*A* and *A$*). Table 2.1 and the preceding text offer the closest comparison, but you may also find tables 6.3 and 6.4 later in this chapter useful.

By area, that group includes 1,135 Biomed journals (3 percent free) publishing 22,325 articles in 2013 (1 percent free); 1,489 STEM journals (6 percent free) publishing 38,953 articles in 2013 (3 percent free); and 632 HSS journals (3 percent free) publishing 12,080 articles in 2013 (1 percent free). There were also 19 miscellaneous journals. Compare that with table 1.1 for *DOAJ*.

Looking at peak article volume, 10 journals in the Beall set published 1,000 or more articles in their best recent year (accounting for 11,771 articles in 2013); 49 published 200 to 999 articles (17,318 in 2013); 219 published 60 to 199 articles (17,759 in 2013); 661 published 20 to 59 articles (16,953 in 2013); and 1,336 published fewer than 20 articles (11,952 in 2013). Table 2.4 is comparable.

Table 6.2 can be compared directly to table 3.2 and shows dramatic differences. Beall journals in Biomed and STEM mostly charge low fees ($201–$600)—and although the Beall HSS journals number less than one-third of the *DOAJ* group, there are actually more fee-charging HSS journals in the Beall set. (There *are* Beall journals with high APCs—more than 100 of them—but they're all either grade *C* or in a *D* subgrade with very few articles.)

Just as almost all journals in this set charge fees, most of them appear to be recent parts of the gold rush. Where the number of *DOAJ* journals starting in 2012–2013 is less than half the number for 2010–2011, more than half of *all* journals in the Beall set (grades *A–D*) appear to have started in 2012 and 2013—1,883, nearly three times as many as in 2010–2011.

To the extent that the Beall set includes actual journals, they are mostly APC-charging journals begun during the gold rush with relatively low fees and relatively few articles, and there aren't that many that sensible authors would *consider* submitting articles to, blacklist or no blacklist.

Comparing Major Areas

Tables 6.3 and 6.4 compare journals and articles with grades *A*, *A$*, and *B* in the *DOAJ* and Beall sets in each of the broad areas. The **/DOAJ** suffix indicates the *DOAJ* numbers; the Beall line follows in each case, with the ratio (*DOAJ* divided by Beall) below that.

Ratios in these two tables show one decimal place because at some APC levels there are actually *more* plausible Beall journals than *DOAJ* journals, even though overall there are several times as many plausible *DOAJ* journals.

There are no cases in which more articles appeared in plausible Beall journals than in *DOAJ* journals—and some of the ratios are fairly astonishing, such as the 727-to-1 ratio for articles in no-fee STEM journals.

Table 6.1. A, A$, and B journals in *DOAJ* and Beall

Group	Journals	% No-Fee	Articles	% No-Fee
DOAJ	5,123	67%	330,924	37%
Beall	1,153	6%	38,673	2%
Ratio	4.4		8.6	

Table 6.2. Fee ranges by subject areas, Beall set A, A$, and B

Area	No Fee	Nominal	Low	Medium	High
Biomed	11	98	196	52	
Articles	60	5,165	3,802	933	
STEM	11	98	255	52	
Articles	60	5,165	3,802	933	
HSS	8	115	128	2	
Articles	102	5,030	2,750	156	

Table 6.3. *DOAJ* and Beall A–B journals by area

Area	No Fee	Nominal	Low	Medium	High	Total
Biomed/DOAJ	824	114	140	165	397	1,640
Beall	11	98	196	52		357
Ratio	74.9	1.2	0.7	3.2		4.6
STEM/DOAJ	1,068	242	230	149	40	1,729
Beall	11	98	255	52		416
Ratio	97.1	2.5	0.9	2.9		4.2
HSS/DOAJ	1,482	105	71	26	4	1,688
Beall	8	115	128	2		253
Ratio	185.3	0.9	0.6	13.0		6.7

Table 6.4. *DOAJ* and Beall A–B articles by area

Area	No Fee	Nominal	Low	Medium	High	Total
Biomed/DOAJ	41,224	9,897	8,869	11,962	44,153	116,105
Beall	60	5,165	3,802	933		9,960
Ratio	687.1	1.9	2.3	12.8		11.7
STEM/DOAJ	43,623	26,050	23,020	20,915	11,934	125,542
Beall	60	5,165	3,802	933		9,960
Ratio	727.1	5.0	6.1	22.4		12.6
HSS/DOAJ	34,911	7,065	4,278	1,197	1,155	48,606
Beall	102	5,030	2,750	156		8,038
Ratio	342.3	1.4	1.6	7.7		6.0

Exiting the Sideshow

I don't think the sideshow deserves more attention. To the extent that Beall-set journals are worthy places for authors and readers, they will almost certainly show up in *DOAJ*. Showing up in *DOAJ* is, of course, *not* automatically proof of high quality. *DOAJ* lacks the resources to ensure that each issue of each journal listed actually meets all ethical and editorial standards. It is no more able to provide a reliable whitelist than one librarian with an admitted disdain for OA in general is able to provide a reliable blacklist.

I've already listed sources for much more thorough coverage of the Beall set—that is, the July and October/November 2014 issues of *Cites & Insights*, with some additional coverage in December 2014 and January 2015. As with the *DOAJ* subset, data (but not publishers, journal names, or notes) for the Beall set is available as an anonymized spreadsheet if you wish to do your own analysis. See chapter 8 for details.

Chapter 7

Dealing with OA Journals

My best guess is that there are more than 5,000 good-quality OA journals accessible to English-language readers (and probably another thousand or more that aren't). I doubt that there's a significant field that doesn't have several good OA journals.

But there *are* questionable journals—certainly among subscription publishers, but also among OA journals, doubtless including some within *DOAJ*. There are undoubtedly also quality OA journals that are *not* in *DOAJ*, and there may be more in the future, given tightened *DOAJ* criteria.

You want to know which journals are questionable and which are good. That's important if you're planning to submit an article, if you're working with scholars who are writing articles, if you're looking to make OA resources more visible in your library—and, of course, if you're being asked to join an editorial board.

Starting Points

I believe there are two paths to be considered:

- If a journal is in the *Directory of Open Access Journals*, are there reasons to avoid it?
- If a journal is *not* in *DOAJ*, are there reasons to consider it?

Before considering those two paths, it's worth noting two key exceptions to the general assumption that good OA journals will be in *DOAJ:*

- **Sparse journals:** The new *DOAJ* criteria preclude journals that don't publish at least five articles per year. That's sensible in most fields, but there are some cases (e.g., journals concerned with a single scholar) where such journals might be worthwhile.
- **New journals:** A brand-new OA journal may not meet all *DOAJ* criteria for a while.

We'll look at those as a third stream.

Spotting Questionable *DOAJ* Journals

You're interested in a particular journal, which seems to have a plausible title, and you find a record for it on *DOAJ*. That record will link to the journal. You should go to the journal's site for the steps here (adapted from the July 2014 *Cites & Insights*).

1. Is there a clear statement as to article processing charges (APC) or other fees? This should ideally appear as a tab on one of the main menus; otherwise, look at Author's Guidelines or About the Journal. If you can't find a statement (and the journal isn't published by a society, governmental agency, academic institution, library, or self-identified volunteer group) or, even worse, if there *is* an APC but the site doesn't say what it is: **STOP.** Go elsewhere.

It would be good if journals published by volunteer groups and by universities, libraries, and societies explicitly said they do *not* have APCs—but, especially for older and smaller journals in Humanities and Social Sciences, the question may never have arisen. For any commercial or quasi-commercial publisher,

step 1 is absolute. If they don't explicitly state whether or not there is a fee and, if so, what the fee is, you should avoid them.

2. Have you or your colleagues been getting repeated e-mail from the journal asking for articles—especially if such e-mail has multicolored text? **STOP.** Go elsewhere.
3. Does the journal or publisher's site make implausible promises (e.g., very short peer-review turnaround) or unlikely statements (e.g., a one-year-old journal claiming to be tops in the field—or any journal charging more than $100 claiming it has the lowest APCs)? **STOP.** Go elsewhere.
4. If there is an APC, is it one you consider reasonable (and are there clear waiver methods)? If not, **STOP**. There are other places to publish. (But see also step 14.)
5. Do article titles over the past few issues make sense within the journal's scope—or at all? If not, **STOP.** You're better off elsewhere.
6. Download and read at least one article in full text (which almost always means PDF), preferably one you think you can understand. If the download process doesn't work, requires registration, or yields a defective PDF, **STOP.** Go elsewhere.
7. Does the article look good enough for your tastes (that is, are the layout and typography acceptable)? Does it seem to be at least coherent enough to be in a journal you'd want to be associated with? If the answer is No to either question, **STOP.** Go elsewhere.
8. During the process of navigating the journal site, looking at archives, and downloading a paper or two, have you been assaulted by ads (where you have to decide what constitutes "assaulted")? Is navigation difficult or taking too long? Is the download taking forever? If the answer to any of these is Yes, then you should probably **STOP.** Go elsewhere.
9. Is the journal a going concern—is it publishing a reasonable stream of articles (where only you can determine what's reasonable)? If not, pause. You're probably better off with another journal.
10. Do the quality of English and the general appearance of the journal's site give you confidence in its quality? If not, pause. You're probably better off with another journal.
11. Does one author show up over and over again within the past few issues? If so, pause. At best, the journal has problems. You're probably better off elsewhere.

These eleven steps may seem like a lot—but it shouldn't take more than five minutes or so to do all of this. If it does, see step 9. If you go through the set and still aren't sure, that alone is reason to consider going elsewhere—but there are two more, somewhat more difficult steps you should take.

12. Check the editorial board for plausibility and to see whether these are real people.
13. Check Retraction Watch—but be aware that excellent journals have retracted papers and that most journals don't show up there.

Retraction Watch
http://retractionwatch.com

Here's a bonus step that I believe is important if the growth in OA is ever to help library budget problems, rather than just shifting costs from one line to another:

14. If there is an APC (and especially if it's a high one), is it going to a publisher you want to reward? That's particularly an issue for big subscription publishers starting bundles of OA journals: is there another equally good OA journal that either has no APC charges, has lower charges, or is part of a publishing operation you'd rather support?

Still not sure? Go elsewhere—or read the Library Loon's article (see "Another Resource" below).

You may have noticed one criterion that's *not* listed here: presence of an ISSN. There are good reasons for that omission:

- At least in the United States, e-journals that do not have explicit issues are not eligible for ISSNs. While most e-journals do and should have year separations, there's no particularly good reason for a purely digital journal to specify issues within a year.
- At least for the international ISSN agency, ISSNs aren't available for journals that have not published at least five articles in an issue. Some sparse e-journals never achieve that level.
- An ISSN says *nothing* about the quality of a journal: it's just an identifier.

Good Non-*DOAJ* Journals

You're interested in writing for, reading, joining the editorial board of, or otherwise being involved with an OA journal that is *not* in *DOAJ*. If it's a "hybrid" journal, you should investigate *closely* whether it is in any real sense meeting the goals of open access; I believe my own skepticism and that of others (including *DOAJ*) is justified. For that matter, does the journal title make any sense to you? (Would *you* publish in

the *Journal of Library*, to offer one mythical example that isn't that different from some "real" ones?)

Otherwise, and if it's not a new or sparse journal, you need to ask yourself *why* the journal is *not* in *DOAJ*—or, if feasible, ask that question of the editor and publisher. I would poke at their answers and probably use a tougher version of the fourteen-step process just discussed. I would definitely read the Library Loon's article (see "Another Resource" below) and apply those tests as well.

Unless you personally know the editor or people on the editorial board and they're willing to vouch for the journal's quality, I'd probably stay away. There may be exceptions for "national" journals (those intended to serve only one nation or region), but even there most of the same questions arise.

Obvious reasons *to* consider a non-*DOAJ* journal are that it fills a gap in OA publishing that no other journal fills, that you have colleagues who swear by it (and none that swear at it), or that you desperately need a publishing credit and don't care where it comes from. There may be others—but not many of them (again, apart from new and sparse journals).

New and Sparse Journals

There are two special cases: journals that haven't been around long enough to be in *DOAJ* and journals that publish fewer than five articles in some years.

I believe the fourteen steps already offered make sense for these special cases as well. Beyond that, you need to have satisfactory answers for one of two questions:

- **New journals:** Is this journal a useful addition to the field?
- **Sparse journals:** Is it reasonable for this particular journal to have so few articles?

New Journals

With more than 28,000 journals, including more than 5,000 OA journals that are reasonably well established and appear to be of good quality, peer-reviewed publishing doesn't suffer from a shortage of journals.

Additionally, the creation of more and more journals may lead to more salami slicing, where scholars split the results of research into more and more, narrower and narrower articles. This wastes everybody's time.

On the other hand, there are probably *many* subject areas where there are not enough OA journals or not enough no-fee OA journals, and certainly many niche fields that would be well served by focused OA journals.

Developing nations and regions may not be well served by the existing journal universe in some fields, arguing for more OA journals to serve scholars and readers in those nations and regions.

If you're considering being part of an actual OA journal startup—being on the founding editorial board or being the founding editor—you and your group have presumably thought about these issues and concluded that there is a need or at least a desirable addition to the field.

In other cases, in addition to the fourteen steps, I'd look carefully at the journal's mission and scope and at the publisher's mission statement. If you see grandiose and unlikely statements in either case, I'd stay away. If you see a clear case for the new journal, it's worth considering.

One clear case for new OA journals is where an editorial board for a subscription journal has become disillusioned with the pricing or other policies of that journal. OA journals *should* attract authors away from subscription journals, especially the most expensive subscription journals. Startups that involve an existing editorial board trying to do a better job through OA deserve support.

What's *not* a good reason for new journals: a "publisher" who wants to establish a big stable of journals (probably with moderate APCs) to make a splash and to make big bucks. The latter is unlikely; the former simply has nothing to do with advancing scholarship or open access.

Sparse Journals

What about barely-there journals? If a journal doesn't publish at least five articles a year, it's not eligible for *DOAJ* (under current criteria)—and if it doesn't publish at least five articles in an issue, it's not eligible for an ISSN (at least from the international agency).

Five articles a year—not five articles an issue—is *very* sparse. For most subjects, it's a sign that the journal's not making it: authors don't consider it to be a good place to publish.

The key question, in addition to the questions you'd ask of a *DOAJ* journal or a new journal, is whether sparseness is reasonable for this particular journal. If it's called an international journal in any but the narrowest field, the answer is almost certainly No—the journal is almost certainly sparse because it's superfluous or questionable. (Really? An international journal on agriculture can't attract five good articles a year?)

But I wouldn't be surprised if the mythical *Journal of Walt Kelly Studies*, devoted to scholarship regarding the creator of Pogo, had only two or three articles per year. The same might be true for any number of author-specific or scholar-specific journals, and for others with clear but narrow niches.

In those cases, the answer's likely to be fairly obvious (and the OA journal should certainly be free to publish and operate with minimal overhead): there's a felt need, but it's just not one that draws many authors.

Another Resource

This chapter borrows heavily from my previous writing on this topic—but also from the Library Loon, probably the wisest pseudonymous writer in the library field. I thank the Loon for inspiration and highly recommend "Assessing the Scamminess of a Purported Open-Access Publisher," posted April 11, 2012, by the Library Loon at the blog *Gavia Libraria*, which goes into more issues than I do (and is decidedly more stringent than I am).

Assessing the Scamminess of a Purported Open-Access Publisher
http://gavialib.com/2012/04/assessing-the-scamminess-of-a-purported-open-access-publisher

Chapter 8

Libraries and OA Journals

The primary goal of open access is to make scholarship available to everybody. That alone should be enough to get librarians and libraries involved. A secondary goal for OA journals—and specifically those not published by the big international journal publishers—is to reduce the ever-growing financial pressures of scholarly journals and, ideally, free up some money for other purposes.

It's not feasible to provide a comprehensive action plan here. Space is too short, I'm unqualified to offer such a plan, and the range of possibilities keeps growing.

Key Steps

Consider the following steps:

- **Understand the issues and the field.** This report is a good start.
- **Help your community to participate.** Work with researchers and scholars to find good open-access outlets—and to understand why finding them is a good idea.
- **Participate yourself.** Consider steering your own articles toward OA journals (see "Finding the Right OA Journal" below) and doing the same with your editorial board, editing, and peer-reviewing activities.
- **Improve findability and publicity.** Make sure your users can find articles in OA journals at least as readily as they can in subscription journals—and, although green OA isn't a focus of this report, see if there are ways to make repository versions of subscription-journal articles more visible.
- **Publish OA journals.** For some academic libraries (and possibly others), it makes sense to start an OA publishing program or work with campus departments (or the university press) to build such a program.

A few additional notes follow.

Finding the Right OA Journal

There aren't any good OA journals in your field (or the field somebody's asking about)? Really? Here's one little list in library science:

Library Philosophy and Practice; *Evidence Based Library and Information Practice*; *Information Research: An International Electronic Journal*; *Code4Lib Journal*; *College and Research Libraries*; *In the Library with the Lead Pipe*; *Collaborative Librarianship*; *Journal of Educational Media and Library Sciences*; *Information Technology and Libraries*; *Ariadne*; *Issues in Science and Technology Librarianship*; *School Library Research*; *North Carolina Libraries*; *Journal of Electronic Publishing*; *Practical Academic Librarianship*; *LIBRES: Library and Information Science Research Electronic Journal*.

Those fifteen journals are all no-fee OA journals I've had some personal experience with. I could add another fifty-seven no-fee journals in the field, and

there are probably a few I couldn't evaluate at all. It's also an incomplete list—for example, *Library Leadership and Management*, the peer-reviewed journal of ALA's Library Leadership and Management Association (LLAMA), is a no-fee OA journal but isn't currently in *DOAJ*. The journals are out there. Shouldn't you be publishing in one of them rather than in a subscription journal?

It shouldn't be difficult to build a similar list for almost any field. As usual, *DOAJ* is the place to start.

Library Publishing

The Library Publishing Coalition is a growing coalition of library publishers. It reports 124 libraries involved in publishing as of the 2015 *Library Publishing Directory*. Those libraries publish (or provide publishing support services) for more than 730 OA journals as well as monographs and, in a few cases, non-OA journals.

Library Publishing Coalition
www.librarypublishing.org

The *Library Publishing Toolkit* "examines opportunities for libraries to leverage their position and resources to create and provide access to content." (I provided a foreword for the 2013 edition but have no other personal involvement in the project.) It includes a range of case studies. It's available as a free download.

Library Publishing Toolkit
www.publishingtoolkit.org

I'll suggest that libraries (working alone or with departments) might focus on specific areas, subjects likely to yield, say, 20 to 200 articles per year—and on finding a way to make it work without APCs. That's likely to be more difficult with large journals, for a number of reasons.

Exploring the Numbers

If you wish to explore the numbers for OA journals in mid-2014 in more detail than is provided here, you can download anonymized versions of the major spreadsheets used in this project—stripped of publisher and journal identification, but including one row for each journal with all relevant nonderived data. Both spreadsheets—the *DOAJ* subset and the Beall subset, including data keys—are on figshare. The datasets are fully available for any use you wish to make of them (as with all datasets on figshare, they have CC-BY licenses); it would be a courtesy to mention my name and this publication in any formal use of the numbers.

Open Access Journals 2014 data, DOAJ subset
http://dx.doi.org/10.6084/m9.figshare.1299451

Open Access Journals 2014 data, Beall-list subset
http://dx.doi.org/10.6084/m9.figshare.1299452

Resources

You'll find some of these resources valuable in helping you to understand OA and consider what steps you and your library could take to make it better.

Open Access: What You Need to Know Now. Walt Crawford. Chicago: ALA, 2011. ISBN 978-0-8389-1106-8. Chapter 5, "Taking Action," offers some starting points for action. Includes a longer list of resources on OA.

Open Access. Peter Suber. Cambridge: MIT Press, 2012. ISBN 978-0-262-51763-8. Also available in open-access form at http://mitpress.mit.edu/sites/default/files/titles/content/openaccess/Suber_05_toc.html or as an OA PDF at http://mitpress.mit.edu/sites/default/files/titles/content/9780262517638_Open_Access_PDF_Version.pdf. Includes a list of additional resources.

Directory of Open Access Journals, http://doaj.org. The starting point for finding OA journals.

The Library Publishing Coalition, www.librarypublishing.org. Publishes an annual open-access *Library Publishing Directory* available in PDF or HTML form; at this writing, the first (2014) edition is also available as an interactive directory at http://atom.lib.byu.edu/lpc.

Library Publishing Toolkit. Alison P. Brown, ed. Geneseo, NY: IDS Project Press, 2013. ISBN 978-0-9897226-0-5 (print). Available as a free download at www.publishingtoolkit.org.

Cites & Insights. Walt Crawford. (http://citesandinsights.info.) ISSN 1534-0937. Free but not OA (it's not refereed scholarship). While *Cites & Insights* is not devoted to OA, that's been a major topic throughout its fourteen-year history. The

research leading up to this report is documented in much greater length but with less overall coherence in the April 2014, July 2014, October/November 2014, December 2014, January 2015, and March 2015 issues. Many other OA-related essays have appeared; those from 2001 through 2009 are collected as *Open Access and Libraries*, available as a 513-page paperback (www.lulu.com/shop/walt-crawford/open-access-and-libraries/paperback/product-10905732.html) or a free PDF download (www.lulu.com/shop/walt-crawford/open-access-and-libraries/ebook/product-17516488.html).

Notes