

## 7

# Alexandria in the Cloud: Promises and Pitfalls of Global Access

How do we bring home the promise of universal access to ever-increasing academic knowledge for everyone? Scholars in the best-funded universities enjoy largely all-encompassing access already. Yet, they are only a tiny fraction of humanity. And even in wealthy universities, when library budgets are cut, digital holdings are, too. Nor can every collection afford every database. The ongoing battle between journals and monographs for the discretionary acquisitions dollar shows that hard-pressed library budgets can no longer solve even the professors' problem.

The pirates have held open a back door to the digital paradise. Sci-Hub, Z-Library, Library Genesis, and other off-piste sites violate copyright laws but deliver a tantalizingly attractive black or grey market product that reveals the possibilities if only we could do it legitimately.<sup>1</sup> Pirates pilfer the publishers' lists, undermining the existing system, but provide no solution. Amid Covid's lockdowns, when even those with library cards to major research collections were shut out, it became evident how crucial digital access is. Online usage of available materials skyrocketed as readers self-isolated.<sup>2</sup> Besides the pirate sites, the only major source of serious reading for average locked-down citizens was the Internet Archive's

National Emergency Library (discussed below). Publishers sued the Internet Archive for its efforts. The digital collections of otherwise exemplary institutions such as the New York Public Library were open for patrons, but for non-New Yorkers the offerings included only public-domain material.

It is technically and physically possible to make all scholarly literature available. As we will see, the money required is already sloshing around in the system. Even copyright's legal obstacles are not insurmountable. How, then, should we proceed?

## Transubstantiating the Libraries

Digitality allows content to be consumed anywhere. Works can be seen by readers unable to reach libraries, whether due to distance, disability, or disinclination. As the internet has democratized, becoming a basic necessity akin to running water, so too has the content it can deliver. Yet, from the rights-holder's perspective, digitality has the disadvantage of making content infinitely reproducible. Once xeroxing became common, paper books also could be copied. That was illegal but, more important, expensive and inconvenient. The final product was but a rough approximation of the original. Though widescale xeroxing of classroom materials did become an issue for publishers in the 1970s, on the whole, analog copying was not a major threat. Digitality upended the analog era's stalemate between rights-owners and consumers by making copying frictionless, cheap, and perfect.

We must again distinguish among the various sorts of content at stake. For the public domain, nothing prevents posting everything on the web. Scanning the originals and making the text searchable costs something, but that is it. For grey and orphan works, out of print but still in copyright, the situation is murkier. These are the texts produced between that moment when copyright

expires—which advances annually from its current position in the mid-1920s—and the more recent date when in-copyright works lose their commercial value and publishers let them slip out of print.

Digitality has, in the meantime, changed the quality of being out of print. Publishers once printed as many books as they thought would sell. Once sales dropped off, having to warehouse stock encouraged them to remainder leftover volumes at deep discounts. Readers of a certain age will remember the remainder tables at bookstores and the catalogs of such books—offered at cheap prices that signaled the end of their active lives. A bargain for readers, remaindering was a death knell for authors. It marked works' crossing the Styx to the realm where books dwell in twilight, awaiting their final extinction as intellectual property. In some small nations, such as Denmark in the 1970s, remaindering was organized nationally. The country's bookstores were flooded for several weeks annually with a wave of cut-rate reading—much as clothing sales used to be seasonal.

Today, with content digitized and print on demand spitting out one copy as efficiently as a thousand, the costs of maintaining a backlist have plummeted. Books are no longer binarily in or out of print. Still, for most works whose sales fall to zero shortly after publication, the economic effect for publishers remains much the same. Having had their day, they no longer promise a return. Such grey works make up the bulk of research libraries' holdings. Google estimates 70% of published works are grey.<sup>3</sup> A quarter of US and UK library holdings may be orphan works whose rights-holders can no longer be identified.<sup>4</sup> Other estimates put the figure as high as half of still-copyrighted works.<sup>5</sup> In theory, these works remain protected by copyright. In practice, they no longer promise rights-holders much economic value. Disseminating them and allowing derivative uses harms no one, while benefitting all. The problem particularly afflicts twentieth-century works, swallowed up by copyright's black hole.<sup>6</sup>

Of such works, the orphaned are the simplest to address. Since no one is hurt by digitizing and disseminating them, and many gain by being able to read them, why not? Given Europe's traditional insistence on authors' rights, one might have expected the first steps to digitize orphaned works from the Anglo-Saxon world. And indeed, true to form, one European blue-ribbon committee did insist that authors be paid when even their grey works were made accessible online.<sup>7</sup> In comparison, both the US Copyright Office and the Gow-ers Review in the UK backed removing obstacles for current authors using orphan works for new creations.<sup>8</sup> But, in fact, the EU pipped others to the starting post by passing a narrowly phrased orphan works directive in 2012 that permitted cultural institutions to digitize works whose rights-holders could not be found after diligent search. One proviso ensured that rights-holders who did emerge would be fairly compensated.<sup>9</sup> The UK now also has an orphan works registry.<sup>10</sup>

Bereft of clear legislation in the US to allow digitizing orphan works, workarounds have been needed. Controlled Digital Lending (CDL) has been developed to deal with this. CDL was first broached by Michelle Wu at Georgetown University Law School.<sup>11</sup> Institutionally, it was pioneered by the Internet Archive starting in 2010.

CDL allows patrons anywhere to view digitized works on screen but not to download or copy them. Only works the library owns a physical copy of can be read, and only one patron sees each digitized version at a time—the own-to-loan ratio. Others have to wait their turn. While a work is being used digitally, it is not available for physical loan, preventing any overall increase in use. In effect, CDL seeks to expand conventional library lending into the digital realm.

CDL solves the orphan works problem, but it also enables the use of works that are not orphaned although still in copyright. Like all library lending, CDL rests on the first-sale doctrine that allows owners to lend or resell works.<sup>12</sup> The wrinkle is that, while physical lending merely transports the work to other hands for a limited

time, digital lending copies a work originally published on paper, thus format-shifting it. In theory, lending means fewer sales for publishers and bookstores. However, most library patrons probably would not have been buyers. Some may be inspired to acquire what they borrow, spurring sales. In any case, libraries are themselves major purchasers, thus compensating for some of the lost business they inflict.

CDL is not perfect open access. Reading is on-screen only, and works cannot be annotated or otherwise used. Yet, allowing anyone anywhere to read online is a major step. CDL, in effect, combines libraries' circulation and interlibrary loan functions. But it does not expand them, only making them more efficient. Libraries are already entitled to lend physical works to patrons and, through interlibrary loan, to other institutions. With CDL, except that the work is being lent in digital format, nothing has changed.<sup>13</sup>

For such lending to happen, however, involves the primal copyright sin of making a digital copy. Since most grey works have been printed on paper, scanning them enhances their usefulness. In a narrow interpretation, that violates copyright. Yet advocates insist that CDL passes legal muster. Fair use permits, and is intended to facilitate, noncompeting uses not otherwise possible. Format-shifting books does not add more lendable copies or deprive authors of anything they have not already lost to physical library circulation. Combined with the first-sale doctrine, CDL is therefore legally unobjectionable.<sup>14</sup>

Unsurprisingly, publishers have a different view. Amid Covid's first wave in March 2020, boundaries were pushed during lockdowns. HathiTrust member libraries were permitted to open scans of in-copyright books to patrons for on-screen reading.<sup>15</sup> The Internet Archive went further. It launched a National Emergency Library that stayed open until June.<sup>16</sup> Since conventional libraries were closed, the only means of borrowing was digital. The National Emergency Library broke CDL conventions by allowing on-screen

reading by more than one patron at a time for books in high demand during lockdown.

That straw overtaxed the camel's back. CDL had been running for a decade without legal objection, but now permitting simultaneous reading sparked a reaction. Very few libraries were competing with publishers for readers during lockdown, and book sales were up during the pandemic. The University of North Carolina Press opened much of its list across various platforms, including the Internet Archive. Rather than tanking, its print sales increased. Nor does it seem that Amazon sales of books suffered during the time they were made available in the National Emergency Library.<sup>17</sup> Nonetheless, this was the moment the publishers decided to strike. In June 2020, a coalition of trade houses sued the Internet Archive for infringement.<sup>18</sup> With the suit ongoing, its effect on CDL remains unclear.

Following in the wind shadow of the Internet Archive, the New York Public Library has begun tailoring a similar approach to suit a large, well-established institution. NYPL combines the vast holdings of one of the world's preeminent research libraries with the street cred and civic spiritedness of the nation's largest public library system. It, too, aims to make out-of-print works available at least on-screen. First, it seeks permission from rights-holders. Only if they cannot be identified does it go ahead nonetheless. And it includes a promise to publishers: works that prove to be popular will be identified, allowing them to bring out new editions. In September 2021, the Boston Library Consortium began something similar, at least for books shared via interlibrary loan.<sup>19</sup> In Europe, CDL was tentatively allowed by the European Court of Justice in 2016, permitting Dutch libraries to lend on a one-view-at-a-time basis any e-book, including self-scanned ones.<sup>20</sup> In the UK, as noted, libraries are expressly forbidden to lend self-scanned works.<sup>21</sup>

As seen with JSTOR, publishers' backlists, once considered largely worthless, have been monetized by digitality. The long tail

is valuable, but only the discovery and marketing allowed by digitality can identify which parts. In the early 2000s, e-readers became widespread, allowing easy consumption of digital content—had there been any. To supply this need, upstart publishers produced and marketed new digital editions of books with a continued readership whose print publishers' claims to the e-rights (unforeseen in the original contracts) proved to be shaky. Books with potential, by authors such as Kurt Vonnegut, Agatha Christie, and George Orwell, were reissued in new e-formats.

Yet, beyond such obvious works, publishers have little idea how appealing any of their backlist volumes are. The sales records of used bookstores might help identify which titles still have legs, but no one seems to be putting that data to use. More telling would be library patrons' demands for digital lends of grey works. With goodwill, libraries and publishers could develop a mutually beneficial relationship. Allowing libraries to scan and lend all out-of-print books would be the publishers' chit. Identifying which books still have commercial value and surrendering them back to the publishers for further exploitation would be the libraries' end of the bargain. As of this writing, and the start of the lawsuit against the Internet Archive, the auguries for a mutual understanding benefiting readers are not encouraging.

Though it might have this welcome effect, the point of controlled digital lending was not to help publishers extract chestnuts from the embers of our cultural patrimony. Most books lose their market value soon after publication. Much as a new car's price collapses as it is driven off the lot, books, too, quickly depreciate. Their commercial life is typically exhausted between a year and a half and five from publication. Some 90% become unavailable within just two years.<sup>22</sup> Yet, in the aggregate, their cultural value far transcends the few titles destined to become tomorrow's classics. They are the bulk of our cultural inheritance, of immense importance as evidence of what humans once thought, believed, and took for

granted. CDL seeks to sidestep the hammerlock copyright imposes on still-protected out-of-print works, allowing them to be used.

Worth noting is that, if legally accepted, CDL would also allow access to work beyond the scholarly. Not just those works it is morally justified to open because taxpayers underwrite them, but all content would fall under CDL. That would not permit the full usability that open access conventionally demands, but expanding even just on-screen reading to much more content would be a major victory.

## The Cost of Levitation

However the disputes over controlled digital lending resolve, let us assume good intentions on both sides and deal with both public-domain and grey content together. Making grey literature and orphan works available on-screen and public-domain content fully downloadable will not be costless. Compared to the value of having at our fingertips the entire corpus of printed human creativity up to, say, 2010, it would still be a small price to pay. But what is the cost?

For that calculation, the number of distinct books and periodicals is needed. The best guess comes from a software engineer at Google Books in 2010. He reckoned that there were 130 million books in the conventional sense and 146 million if we include bound volumes of periodicals and government documents.<sup>23</sup> The uplift for journals (12%) is high compared to an analysis of the UK's research libraries, where books make up 88% of the collection and serials only 5%.<sup>24</sup> A European survey, in turn, analyzing only holdings in libraries there, estimated 77 million book titles.<sup>25</sup>

Based in Ohio, WorldCat amalgamates the records of some 15,000 libraries in over 100 countries.<sup>26</sup> Although not exhaustive, it is the closest we have to a global library catalog. WorldCat's tally of



“distinct print book publications” in 2015 was 180 million for the globe.<sup>27</sup> But what proportion of worldwide book output is collected by its libraries? By one estimate, WorldCat has been collecting the bibliographic records of between 44% and 48% of all books up to 1940.<sup>28</sup> Three-quarters of all books in the Google 5 libraries were published after World War II. Suppose that similar proportions hold for WorldCat’s collections (and this also assumes that every book published has been collected by a library somewhere). In that case, 25% of the 180 million books in 2015 will have been published before the 1940s, or 45 million. If these then represent some 46% of total global book production, that means about 70 million books globally stem from the pre-1940s.

For the proportion of more recent books WorldCat registers, the figures become vaguer. For 2000, UNESCO estimated global book production at one million titles, while WorldCat collected 689,000 catalog records that year, or about two-thirds of global output.<sup>29</sup> For the most recent year available, however, global book production has been estimated at 2.2 million.<sup>30</sup> In 2019, WorldCat recorded 2.048 million new titles, in 2020, 1.439 million.<sup>31</sup> The average of these two figures’ coverage rates is about 80% of global publication that WorldCat’s records account for in recent years. If we conservatively estimate WorldCat’s hit rate in the post-1940s era at 75%, then the 135 million post-1940 books in WorldCat scale to a total post-1940 book output up through 2015 of about 170 million. The total number of books that have been produced globally up to 2015, adding pre- and post-1940s books, would thus be ca. 240 million. If 2.2 million books are produced annually, we add another 13 million to get us to the present day, or a total of 253 million in 2021. That is higher than the Google estimate.

How many of these are in the public domain? The share of books in WorldCat published before 1923, a rough measure of out-of-copyright titles, is 18%.<sup>32</sup> To this in the US one would add works published between 1923 and 1964 whose copyrights were not

renewed after the normal term. Estimates suggest that as many as three-quarters of these reverted to the public domain.<sup>33</sup> All told, it has been estimated that perhaps 20% of all books are in the public domain, so that would be 50 million of the 253 million, with 203 million still in copyright.<sup>34</sup> Then we need to know how many are out of print but still in copyright. Let us assume that books published more than 10 years ago have largely lost their commercial value and that some 2.2 million books have been published annually in the past decade. Lopping off 22 million from the 203 million that remain in copyright, we arrive at 181 million grey works that are in copyright but out of print or without commercial value.

Assume 181 million as the number of grey works in need of scanning. Add to that the 50 million in the public domain. A good chunk has already been digitized via the HathiTrust, JSTOR, Google Books, and the like. Google alone is said to have scanned 25 million books. So, if we do not duplicate, that leaves 206 million in need of scanning. At an average of 250 pages per book, that is some 51 billion pages. The Internet Archive charges 5¢ per page to scan and run optical character recognition for searchability, thus, a total cost of \$2.575 billion.

That leaves scientific articles, of which 50 million existed in 2010.<sup>35</sup> Let us assume that three million have been published annually in the meantime.<sup>36</sup> Let us also assume that articles lose their intellectual and commercial value after five years (peak citations come at year three for scientific publications). To the 50 million, we thus add another 18 million, bringing a grand total of 68 million in 2016.<sup>37</sup> Estimating the average length of scientific articles is tricky. Salami-slicing research into ever more articles may have reduced each unit's size. The use of graphs, panels, and other data items has doubled in the life sciences over the past decade, complicating attempts to measure. The growing number of references has a similar effect. In 2013, the average length of life sciences articles

was 10 pages.<sup>38</sup> That yields 680 million pages to be scanned, for a total (at 5¢ per page) of \$34 million.

In other words, for slightly more than \$2.6 billion, all public-domain and out-of-print or at least out-of-use books and scientific articles could be scanned. How much journalistic content is included here depends on what percentage of WorldCat material is of this ilk.

A report for the EU in 2011 estimated the costs of digitizing Europe's libraries at €19.77 billion, or \$27.5 billion at the exchange rate then. Given that this was for digitizing 77 million books, the cost per book was an eye-watering \$357, or more than a dollar per page. How these costs were arrived at is unclear from the underlying report. That document inexplicably assumed the total number of pages to be digitized as only 1.92 billion. In fact, it made an arithmetic error, multiplying the number of books by 25 pages each, rather than the 250 it took as an average length. As a result, it reported what would be a truly extravagant per-page digitization cost of between €2.5 and €6.

This total did not count rare or fragile books, of which there were estimated to be 7 million, costing €7 to €11 billion, depending on assumptions, to digitize.<sup>39</sup> Multiplication errors aside, the report used what appears to be a sophisticated and differentiated methodology. Advances in digitization over the past decade will have lowered costs. Also true is that digitization can be done to different standards. Preservation digitization is more painstaking than merely giving reading access. For the bulk of library content, the latter will suffice. Rare and nonstandard-format works require special handling. Yet, the costs per book assumed in this report of between €124 and €170 remain remarkably high. Recall that the Internet Archive budgets 5¢ per page, so \$12.50 for a 250-page volume. Reports on the Google Book project have estimated costs at about the same level.<sup>40</sup>

Returning to our estimate of the cost of digitizing the entire global corpus at Internet Archive rates, this is a one-off expense and covers every no-longer commercially viable book and scientific article in the world. By way of comparison, \$2.6 billion is about 15% more than the inflation-adjusted cost of constructing the Getty Center in Los Angeles, one-fifth the going rate for a new aircraft carrier, or the price of 10 Boeing 747s. In the grand scheme of things, to get the global library of Alexandria universally available would be a bargain at twice, thrice, or even ten times the cost. For the results, this is a fire sale: the entirety of published human creativity up through the last decade, open to anyone anywhere.

But this price gets us universal access only to content in the public domain and CDL-style admission to that which has lost its commercial value. Since few works exist only on paper any longer, scanning costs will fall away. If we soon solve the problem of opening current content, thus eliminating the issue henceforth, the inexorable advance of the public domain will take about 80 years to resolve the issue of material currently in copyright yet commercially valueless. In the meantime, barring the unlikely event of major copyright reform, the legality of allowing access, even just on-screen for one reader at a time, to in-copyright material hinges on CDL withstanding the suit brought by publishers against the Internet Archive.

## Copyright and Property

Property rights are the foundation of capitalist democracy. They make ownership legally defensible, rewarding those whose efforts and ingenuity provide what buyers are keen to acquire. Even the most fervent social democrats recognize that the East Bloc socialisms were undermined above all by communalizing ownership. All owned everything, and no one took responsibility for anything.

“We pretend to work, and they pretend to pay us”—the Soviet joke summed up the logic. Crumbling housing, antiquated technology, moribund factories, and barren collective farms were the outcome. No one old enough to have visited the East Bloc before 1989, remembering its irremediable dreariness, gloom, filth, and decrepitude, can have remained unmoved by market economies’ siren song. For all their sins and pressing need for regulation, they allocate resources more efficiently and motivate effort by rewarding it better than central planning ever could. We threaten property rights at our peril. Every nation has the legal means for eminent domain. They can take property—normally real estate—required for communal purposes, where the owner’s claims must bow to society’s. But such interventions happen rarely, for good cause, and only with caution.

Occasionally, an entire class of property is ended. For moral reasons, something earlier considered property and subject to its owner’s will is emancipated. From object, it becomes a subject. Often this occurs without compensation. When the ancient Greek state forbade infanticide, when children were liberated from their fathers’ control at a certain age, attaining legal majority, when they were allowed to choose their spouses, when their births were registered, when their parents had to school them—all these reforms chipped away at parents’ property rights in their children. They curtailed fathers’ absolute control and imposed obligations to meet minimum standards of care. For such loss of property rights in their offspring, parents were not compensated—unless one counts family allowances, public schooling, and other social policies to defray the cost of obligations now made a condition of parenthood.

Much the same holds for husbands’ loss of full property rights in wives. At some point, the property a woman brought into marriage no longer automatically belonged to her husband. If women worked, or otherwise earned or were propertied, their income became reserved for them. Eventually, husbands could no longer

physically chastise wives, nor did married women owe them obedience and submission. Nor, at long last, could a man treat his wife's sexual services as his to demand.

When slaves were emancipated into legal personhood—often just partial to begin with—compensation varied. In the US, the moral stain was regarded as so absolute that no recompense was offered owners, and the bloodiest war thus far was fought. In Britain, where slaves were owned far from the homeland, compensation for owners was the largest payout by the British state until the banking rescue package of 2008. Owners received £20 million, £2.4 billion in today's money or £150 billion if measured as the 5% of GDP slavery was then. The emancipation of enslaved Americans was the largest expropriation of what then counted as property since the Reformation's taking of Church lands and the French Revolution's of aristocratic real estate. Slaves constituted 40% to 60% of the South's total wealth, while the Revolution's appropriations affected 20% of all French land.<sup>41</sup> Only the expropriations in Eastern Europe under Communism were greater.

Is intellectual property something analogous to the unwarranted ownership of what was once considered legitimate property? An obvious difference is that property in ideas and their expression was created recently, not inherited as an ancient moral blemish from deep antiquity, as with property in humans. In debating intellectual property, each side has felt it commanded the moral high ground, with legitimate arguments, not just hoary convention, as with slavery or women's subjugation.

Slavery was an analogy enlisted on both sides of arguments over intellectual property. In the nineteenth century, reformers who sought to endow creators with stronger rights to their works in the US, akin to those enjoyed by Europeans at home, portrayed authors as slaves. Unprotected by international copyright, authors, like slaves, were deprived of natural rights to property—whether in their bodies or the products of their minds. “An English writer

is treated by America,” the English magazine *Punch* complained in 1847, “as America treats her Negroes: he is turned into ready money for the benefit of the smart dealer who robs him. . . . America sells the bodies of blacks, and steals the brains of the whites.”<sup>42</sup>

Others turned this logic on its head. Both slavery and copyright were artificial limitations on natural freedoms. No more than one human could own another should they have property rights in ideas and their expression. Neither slaves nor works were natural forms of property. They were merely conventional forms of ownership created by human law that, once recognized as immoral, could and should be abolished. Authors were like slaveholders. They unethically subjected what they illegitimately regarded as their property to their wishes rather than freeing it.<sup>43</sup>

The debates over open access echo such positions. Is academic knowledge intellectual property like any other, legitimately owned by its creators? Or is it that part of intellectual property on which conventional ownership has least purchase? The positions span the gamut. At one end, publishers and authors demand perpetual inviolable rights. At the other, reformers call for nationalizing, or at least heavily regulating, scholarly publishing.<sup>44</sup>

## Publishing Open Access

Though scientific articles have attracted most attention, scholarly books present their own problems. They fall into at least two categories. Those with commercial potential are often sold to trade houses that treat them like other books. University presses, in turn, are nonprofit and often subsidized by their parent institutions. Their mission has traditionally been to publish scholarly works with only marginal market appeal, purchased mainly by university libraries and a few researchers. Library budgets have financed university press books. To make up for cutbacks, these presses have

also established trade divisions, eager to spot works that sell beyond the academy and fatten the bottom line. Occasionally, they strike gold. Thomas Piketty's *Capital in the Twenty-First Century* turned into a nice little earner for Harvard University Press in 2014, selling millions. Harry Frankfurt's *On Bullshit* worked similar magic for Princeton.

Who will pay for scholarly books, if not the research libraries? As budgets suffered under rising subscriptions, monograph purchases declined. The library sales in four figures that university presses relied on in the 1980s have shrunk. In 1980, 2,000 copies of a history monograph might sell, by 2005, only 200.<sup>45</sup> The average scholarly monograph these days sells 60 copies.<sup>46</sup> Who will pay to publish humanities research? Specialized open publishers and the open-access divisions of existing academic presses stand ready to deliver, but their expenses must be met.

For a sense of the cost of making scholarly books accessible, consider what publishers currently bill authors. Among the Anglophone publishers, Palgrave charges \$17,500, Brill \$12,200, Ubiquity between \$5,000 and \$12,000, Cambridge \$10,000, Bloomsbury £6,500 to £12,000, the University of California Press's Luminos series \$15,000, and MIT Press the same. Open Book Publishers, a nonprofit open-access house, charges about \$8,000.<sup>47</sup> These are the sums announced on the publishers' websites. Some charge higher fees for works under CC BY, the less restrictive form of licensing that allows competing editions, than for CC BY-NC.<sup>48</sup> Other sources show that the mean book publishing charge in recent years has been somewhat lower than list prices suggest, namely \$5,205.<sup>49</sup> Another study indicates that UK publishers average £7,500, or \$9,700 at the going rate in 2017.<sup>50</sup> Dutch monographs cost €12,000.<sup>51</sup> Swiss monographs cost 13,800 francs in 2018, or almost \$15,000.<sup>52</sup>

To put this in perspective, a recent study of the actual expense of publishing conventional academic monographs by American



university presses arrived at per title costs for producing the final finished copy (but not its physical printing) that varied from \$15,000 to \$130,000.<sup>53</sup> That suggests much higher expenses for open editions, too. Are the open-access presses delusional, cross-subsidized from other sources, or wondrously efficient? The study also revealed that the single biggest cost for academic publishers was staff time. Acquisitions make up the largest share of staff costs, around half, depending on the size of the press. That is unexpected, since university presses primarily sort through manuscripts sent them by eager scholars.

Staff interviewed insisted of course that they were more engaged than that. But one of the activities driving up costs included acquisitions editors “immersing themselves in the fields in which they specialize”—in other words, reading around on company time. Nice work if you can get it, but unclear what value it adds to dissemination. The editorial process is more about weeding out the inappropriate than actively seeking the best—as it has been from the moment peer review began.<sup>54</sup> Even during the Covid pandemic, the rate of manuscript submissions at US university presses ticked over nicely.<sup>55</sup>

By providing a forum for work of a certain sort, editors may influence a field’s direction. Journals make that most evident: *Annales* for big-scale history, *Past & Present* in its heyday for early modern social history, *Comparative Studies in Society and History* for historical sociology, and so forth. Even for monographs, such influence is not absent. Presses sometimes specialize. That in itself does not lure authors to enter those fields, though it does funnel existing work to specific houses. Occasionally, an editor may encourage scholars in directions they would not otherwise have taken, shaping a field—William Germano at Routledge helping birth cultural studies in the 1980s and 1990s.<sup>56</sup> But we would not want to go far down this road of confusing medium and message, nor underestimate the more fecund influence of *Doktoerltern* and above all scholarly peers.

The idea of a “commissioning editor” is something of a fiction, compounded since the term is an Anglicism for what in the US is more accurately known as an “acquisitions editor.”<sup>57</sup> Sure, editors hang at the bar during big conferences, sweet-talking scholars into giving them a first look at their latest manuscript. But the idea that academic books are meaningfully commissioned seems something of a *Lebenslüge* in the business. Those rare occasions when trade presses pay large enough advances for authors to undertake projects could perhaps be construed as commissioning. With academic books, that never happens.

Add to that the editors’ schtick of presenting a balanced list for each season, publishing some books on subject A and others on B, and never too many on any given topic—as though they were florists arranging a bouquet. A publisher’s list is a transient assemblage of a smattering of titles in a sales catalog sent to a few thousand addresses twice a year. No one pays attention to its balance except perhaps other editors. Neither authors nor the reading public could care less. If three Lincoln biographies arrive in one season, buyers will not react differently if they are issued by one press or three. Why would they even notice the difference?

Striving for a pointless balance in publishers’ lists may not be a major driver of costs, but it exemplifies the current system’s crabbed inefficiencies. And it undermines a press’s attempts to develop expertise in particular fields, a comparative advantage. But even that is a questionable ambition. Like the journal-level impact factor metrics that quantify a periodical’s reputation, then assume it embellishes individual articles, so books published by certain presses renowned in specific fields may gain more attention. Yet the logic of such borrowed prestige is no more convincing for books than for journals.

As the variability of costs for open-access books suggests, the economics of publishing is akin to pharmaceuticals or Hollywood, with room for creative bookkeeping. One of the main drivers of expenses for established academic presses is their sales structure,

which accounts for up to 60% of revenues.<sup>58</sup> Given that paper editions at conventional prices are published alongside open versions and that the open edition sometimes spurs sales of physical volumes, why are authors charged anything at all? Or, at least, why are charges not refunded if physical book sales earn their keep? A pilot project sponsoring open monographs followed this logic, with low publishing fees in return for allowing three years of print sales before open release.<sup>59</sup>

Let us take as a conservative estimate \$10,000 to issue an open-access volume. How many books are in question? The US produces a bit more than 300,000 distinct titles annually, the world perhaps 2.2 million.<sup>60</sup> Such figures harbor some overlap. Many new UK titles are merely British reprints of US books and, conversely, a smaller slice of US titles. The trade agreements that still mandate separate US and UK editions produce duplication. Elsewhere, this is less likely. Austria and Germany do not require distinct editions of the same works for their respective markets. Overall, such overlap will be smallish and affect trade books more than academic monographs.

How many books are monographs produced as part of their professional work by salaried scholars? The figures are imprecise. They do not exist for the major Anglophone markets where university presses are best developed and most clearly distinguished from trade houses. For other countries where figures are available, they are low (3% in Italy). What is labeled educational publishing covers textbooks for schools and universities, which are not comparable to academic or scientific books. But even educational publishing's percentage of units is small: 4% in the US, 13% in France, 22% in the UK. Its share of publishing revenues is higher: 30% in the US and 41% in the UK, but only 13% in France.<sup>61</sup> In Chile, educational books are about 10% of total output; in Latin America, more generally, 8%.<sup>62</sup> Other sources suggest that, of total US publishing revenue (\$26 billion), only 1% is generated by university presses (\$260 million).<sup>63</sup>

In 2016, the UK's four largest scholarly publishers, responsible for two-thirds of academic press output, issued 6,650 titles.<sup>64</sup> The Association of University Presses unites 154 houses across 17 countries. Its members publish some 12,000 titles annually, 9,600 from the US in 2020.<sup>65</sup> To be conservative, let us double the US number to account for nonmember presses. If the US publishes 20,000 academic titles annually, then 6% of American books are scholarly. On the other hand, estimates of academic and professional titles published in the UK are half of total book output.<sup>66</sup> That seems unrealistically high and hard to reconcile anecdotally with bookstores bursting with nonscholarly content. Nor does it jive with the 15,000 or so books submitted in the UK for the 2014 research evaluation, covering the previous five years, i.e., some 3,000 works annually.<sup>67</sup> Unless, that is, the vast majority of academic books issued in the UK is authored by scholars employed elsewhere and therefore not submitted for local evaluation. In any case, only some of these figures account for serious nonfiction published by trade houses.

If the US proportion that 6% of total publishing is scholarly holds globally, 132,000 titles each year are academic works. At \$10,000 each in publishing fees, the total annual cost would be \$200 million in the US and \$1.3 billion globally. This is broadly in line with the £19 million annually estimated as necessary to issue in accessible editions those books submitted to the British research evaluations.<sup>68</sup>

Where will we find the money for the world to read these works freely? The bad news is that these are large sums to stump up, especially for the humanities and social sciences. For the hard sciences, publication costs amount to 1% or 2% of total research funding. Somewhere around a third of scientific articles are now open.<sup>69</sup> 28% is a popular figure, but imprecise. Open access also varies markedly among disciplines. At 88%, astronomy and astrophysics have the most available content, while literature is the caboose, with only 14%. And it varies across countries. Up to half of scientific literature is said to be freely available in research-intensive nations, but that is

hard to verify.<sup>70</sup> 40% of Swiss articles are open, but only 15% of Russian.<sup>71</sup> This does not take into account illegal content leakage onto the web via private postings or repositories, nor Sci-Hub or other pirate sites.<sup>72</sup>

If freely available scientific articles increase to 100%, we can expect costs perhaps to triple. Whether the expense will go beyond that is unclear. Only a fraction of open articles is published as gold, with the author or funder paying charges. Diamond access is financed from other sources but must show up somewhere in the overall cost of scientific publication even if the exact sums are unknown. Insofar as green access becomes regarded as insufficient and shifts to gold, that will also increase costs. On the other hand, the 1% to 2% figure mentioned above accounts for the total current expense of publishing as a fraction of research costs, not article processing fees. If so, it already captures the total cost of dissemination, and expenses will not increase even as more articles are opened up.

The good news is that existing library budgets are large and that sufficient money exists already in the system to cover costs. It merely needs to be rechanneled. There are almost 120,000 libraries in America. Their combined acquisitions budgets—not operational costs or staffing or the like, but the cost of buying content—is \$4.7 billion for the most recent year available.<sup>73</sup> Globally, libraries spent \$30 billion on content in 2018.<sup>74</sup> Such sums are not, of course, available for repurposing as a whole. These libraries include local public, school, and college libraries, not just research collections. They must buy nonacademic books, even as some of their holdings will also be works of scholarship that they no longer need to pay for in an open-access future. More narrowly, the 3,800 US research libraries' expenditure for all information sources in 2012 was \$2.8 billion: \$720 million was for conventional books and \$180 million for electronic versions, about one-third of total outlays.<sup>75</sup> In 2018, the global academic library spend for content was \$6 billion.<sup>76</sup> If

the US ratio of books to content holds worldwide, then the amount available to pay for books in some other way is about \$2 billion. Nevertheless, the data from other nations may not be equally encouraging. In the UK, for example, annual research library spending on books is only \$16 million, over an order of magnitude smaller than the US figures.<sup>77</sup>

As we have seen, the theoretical cost of publishing all American academic books openly would be \$200 million annually, an amount easily handled by the sums available (at least \$720 million) in the research library budgets. But that amount must also pay for non-scholarly books and trade nonfiction. Moreover, 60% of holdings in US research libraries are in languages other than English. Assuming that each nation pays charges for its authors, foreign scholarly works become someone else's responsibility. The US library system already disburses sums greater than necessary to flip American academic monograph publishing to open access. With other nations doing their share, the problem would be solved globally.

For periodicals, much the same holds. US libraries spent almost \$2 billion on journals in 2012 (\$1.9 billion, of which \$1.4 billion went for electronic editions).<sup>78</sup> Using rudimentary and low-ball calculations in 2015, the Max Planck Gesellschaft calculated that library budgets already had the funds needed to flip all scientific journals to open access.<sup>79</sup> Journals present different issues than books. They are a larger expense but also more centralized. The monies spent by American libraries alone are likely to free up a larger fraction of total global content than is true for books. Assigning scientific periodicals to their national origins is not as simple as for books, which remain a more local project. The scientific publishing industry is overwhelmingly Anglophone, the language of the trade. Most of the big publishers are European. Only Wiley is based in the US. But publishers work globally, and to saddle a nation like the Netherlands with the access charges for Elsevier makes little sense.

Also at issue with journals is whether the current state of affairs should be locked in as the new normal. The expense figures

represent the situation at the end of a period of sustained escalating subscription and then article charges—the serials crisis. Suppose that an overall repurposing of library budgets is to be used for open access rather than to pay subscriptions and buy conventional books. A fair division of the spoils among academic fields and the media they employ is then required. Otherwise, what looks like a simple switching operation from the scientists' vantage means cementing in place an imbalanced status quo for other fields that have been pushed aside.

Whatever the decision on tolerable profit margins for the scientific publishers, flipping to open will likely bring other savings to the overall cost of scholarly dissemination. Physical libraries are inherently expensive. As content is digitized, resident in the cloud, that will cost storage, maintenance, discoverability, upgrading, and the like. But it will save what are likely the larger sums for acquisition, storage, shelving, preservation, and care of paper content. It is the nature of physical books and libraries that they duplicate—that is their purpose. The cost of several hundred copies of each monograph for the 3,700 US research libraries is saved when publishing flips to open. Instead, we spend \$10,000 for each book to make it available not only at libraries but everywhere. Other savings accrue, too.

In 2019, North American research collections held almost a billion physical volumes and 59 million distinct titles. Of the billion, some 94% were thus duplicates.<sup>80</sup> Storage costs in open stacks (heating, cooling, reshelving, real estate) are estimated at \$4.26 per volume per year.<sup>81</sup> If so, then the mere physical presence of those 941 million duplicates costs libraries over \$4 billion annually. That sum is certainly exaggerated, given that other—compact—storage options are cheaper and that operating expenditures for US research libraries in 2012 were only \$778 million.<sup>82</sup> Nonetheless, with digitization, the sheer physicality of content will no longer weigh as heavily. Much library space can be repurposed. It can be downsized as duplicates are deaccessioned and as the physical copies of

now-digitized works that need to be kept are moved off-site from pricey downtown or midcampus locations.

US research libraries spent \$32 million in 2012 on interlibrary loans. In the open-access future, that need evaporates. Preservation costs were \$27 million, much of which will not be required or can be repurposed for software upgrading, backward compatibility, migrating, and the like.<sup>83</sup> No one wants to make librarians redundant. But again, some savings are likely. The need for cataloging, preserving, acquiring, managing subscriptions, shelving, and reshelving will diminish. US research libraries had 86,000 staff in 2012, paid \$3.4 billion. Much of that will no longer be necessary, especially as we need fewer separate institutions.

Worth repeating is the caution that just because the monies are already there, it does not make them available for new purposes. In modernity, famines are caused not by an absolute lack of food but by its misdistribution. Existing library budgets could fund open access. For that to happen, the scientific houses would have to relinquish dictating subscription prices and article fees. Despite protests, boycotts, and funder mandates, their revenues have not been much dented. Nor would we be concerned with new venues for accessible publication were it not for the suspicion that the current players are unlikely to release their grip. The monies are there to publish every academic book openly, even at the top-dollar price of \$15,000 per volume. The various new means of open publication, explored in the conclusion, bring efficiencies and trim costs. They are needed precisely because it is unlikely that the existing and available monies match.

## **Publishers and Open Access**

Green and gold open access pose different scenarios for established publishers. Parallel green, where open repositories overlies existing



subscription journals, does not much trouble them. That also holds for books, so long as accessible versions do not compete head-on with paid-for ones. Some presses allow authors to post prepublication versions of manuscripts even as the finished book is conventionally marketed.<sup>84</sup> Some, such as Leiden University Press, make published versions accessible after an embargo. Others discount publishing charges if books are made freely available only after a delay. That allows houses such as Amsterdam University Press a temporary monopoly for paper editions.<sup>85</sup> So too, some nations have enshrined in law authors' right to self-post articles and book chapters (not books) after embargos of six or twelve months, at least for publicly funded work.<sup>86</sup>

So long as they are not responsible for the green repositories, publishers are asked only to tolerate whatever competition prepublication versions pose to the finished editions. Their interest then becomes hobbling the open versions—keeping them distinct and inferior to the version of record and ensuring that embargos are lengthy.

Gold access, in turn, poses both threats and promises. If digitality is used as an excuse to trim publishers' expenses and cut their profits, dangers lurk. However, suppose the implications of switching to open dissemination are to pare now-unnecessary costs of conventional editions (printing, storage, shipping, subscriptions) but not the value publishers claim they add (reviewing, editing, typesetting, promoting). In that case, enough fat remains to keep them happy. Publishers have done well from open access. After some initial stumbles, they have nimbly repurposed as publishing charges most of the funds that once were earmarked for subscriptions and acquisitions.

Established publishers worry more about green access. Investment bankers have welcomed the gold route as delivering the same money in another guise but fear that green could undermine conventional outlets. If authors post work to repositories and all

research is immediately available for free, who will subscribe to journals?<sup>87</sup> Publishers can live with gold and have negotiated an accommodation. So, too, they can tolerate parallel green, which in effect leaves them untouched. What most troubles them is the prospect of a green repository-style system that would slash the unit costs of dissemination and eviscerate their claims to a crucial role in the process. We return to this in Chapter 8.

We glimpse publishers' mixed motives in the tussle over the so-called rights retention strategy. Rights retention is part of Plan S, the policy of some European funders to require immediate access to work they support. It obliges authors who publish in conventional subscription journals also to deposit at least the final accepted manuscript in an open repository with no embargo period.<sup>88</sup> It thus insists on an immediate form of green access that competes with gold. The rights retention strategy seeks to accommodate authors who cannot pay article charges or who publish with small scholarly societies unable to afford the cost of flipping to gold.<sup>89</sup> The well-heeled scientific periodicals, finally at ease with the gold strategy, naturally oppose such poaching on what they regard as their turf.<sup>90</sup>

Publishers' preferences vary by historical tradition, too. European law has long upheld rights-holders' interests over the audience's. It has anchored moral rights, giving authors extensive powers over their works. It has extended authors' claims far beyond the score of years originally granted. The Anglophone nations, in contrast, have traditionally tended to emphasize copyright's social utility—how it rewards authors merely to stimulate their creativity, and then only briefly. As a content-importing nation for its first two centuries, the US had Robin Hood instincts: take what you need and claim you are motivated by the good of your people. By the early twentieth century, however, America had become the single largest exporter of intellectual property. Then its interests—or at least its major content-producing sectors—pivoted to align with the European penchant for strong rights.<sup>91</sup>

Echoes of such earlier debates resound in current positionings over green and gold. European companies dominate scientific publishing. All but one of the five largest (Thomson Reuters, dual-listed in Canada and the UK) are European conglomerates.<sup>92</sup> Scientific publishing has become a lucrative export earner. Of total publishing revenues, the scientific make up 15% in Spain, 16% in France, 27% in Norway, 46% in Belgium, and a whopping half in the UK—but only 8% in China and 1% in the US.<sup>93</sup> EU politicians bemoan California companies' hamper on search engines and social media, but their own monopoly on scientific information appears unobjectionable. They are keen to protect the home team. They often lard an economically nationalist argument with appeals to preserve the high-cultural European tradition against Anglo-Saxon predation. And yet, if anything, the lines of attack run in the opposite direction. European trade houses have been swallowing Anglophone publishers. Bertelsmann owns Penguin Random House, the largest trade book publisher, and it wants to add Simon & Schuster. Hachette has bought Time Warner and now Workman.

British publishing has been especially caught in the cross fire because of its peculiar nesting in the Anglophone world. Britain is a medium-sized nation fortunate to share a common language with a large country as well as several others, including the vast and partly Anglophone Indian subcontinent. Correctly positioned and protected, British publishing has been an important export industry. Its domestic market was cushioned by an agreement with US publishers that other countries' books could not be issued in the UK or the Commonwealth nations except by British publishers.<sup>94</sup> That cozy arrangement was ended in the 1970s by threats of antitrust suits in the US. The English-language market was no longer carved up between British and US houses, but UK outlets retained exclusive rights to their home market.

In subsequent decades, however, publishers from both sides of the Atlantic set up shop or bought subsidiaries on the other shore

to flog their wares directly in the new market. Given their nations' respective sizes, UK publishers especially have sought an American beachhead. The large British scholarly publishers (Oxford and Cambridge), as well as those of the second (Routledge) and third (Palgrave) ranks, have positioned themselves on both sides to exploit the Anglophone market.

Publishing interests aside, a nation's research intensity also influences its take on open access. Research-intensive countries, such as the US, Japan, and China, are skeptical of gold since it saddles them with high dissemination costs. China seems less enamored of gold than the Europeans, more in favor of green, which suits its position as it expands its research output. China's university libraries have been hard-pressed to afford Western subscriptions, but as the nation's scholars supply a growing fraction of the world's content, it would find paying gold charges equally difficult.

In 2018, at an average fee of \$2,323, the cost to issue China's articles as gold would have been almost \$1.4 billion. Better then to go for green, with its lower costs.<sup>95</sup> The third-largest producer of scientific papers, India, also rejects Plan S, the European funders' attempt to cement gold as the preferred route. The Indians hope to negotiate a national bulk rate with publishers, allowing their citizens to read for one flat fee paid by the government. Their researchers, meanwhile, will publish in open repositories.<sup>96</sup> That would be the best of both worlds, cheap reading and inexpensive publishing—but it is based on the unlikely assumption that publishers will be willing to discount a countrywide subscription.

Research-lite countries, in contrast, stand to benefit from gold as readers who no longer have to pay subscriptions. But if they also entertain ambitions to produce content, they may anticipate problems with publishing costs. Several European nations are both research-intensive and—as home to major scientific publishers—content exporters. For them, the balance is likely neutral, whether collecting article processing charges or subscriptions.<sup>97</sup> They must

pay subscriptions or publishing fees. But their publishers profit from selling their products, financed either way, in the great abroad.

Plan S, based on gold, is primarily a European phenomenon. True, the Swedes have bailed, and the Germans have not signed up. But neither have the Chinese, and only two US funders are on board. Similarly, transformative read-and-publish agreements, discussed in Chapter 4, are favored in Europe. In effect, they switch subscription payments to publishing charges for gold access.<sup>98</sup> The publishers are paid similar amounts as before, even as the terminology changes. Plan S institutionalizes such agreements, insisting that funders not pay for publication in subscription journals unless they are in the process of flipping to open. The University of California's 2021 agreement with Elsevier was a rare US version of such deals.<sup>99</sup>

More commonly, US institutions have tackled the problem by unpicking their big-deal agreements with publishers.<sup>100</sup> Research libraries subscribe to the journals most used by faculty and students. Rather than buffet-style, all-you-can-read contracts, they are reining in costs by ordering à la carte. Some report savings of up to half of big-deal prices.<sup>101</sup> Means of accessing articles in journals no longer on the menu have been worked out.<sup>102</sup> Search engines scour the internet for prepublication, privately-posted, or other accessible versions. If all else fails, individual articles can be summoned for a fee via interlibrary loan, although too many of those and the savings from canceling big deals evaporate.

## Data and Content

A final observation on the growing role legacy publishers continue to play in open access requires a distinction between data and content. We have more content than ever, but even more data. Raw data pour out of huge scientific projects, such as CERN's supercollider, and from our everyday world. English-language Wikipedia is

90 times as large as the *Encyclopedia Britannica*. But CERN's data output is much larger than anything from the analog world. It collects a petabyte of data daily (one million gigabytes, each a thousand times an expensive laptop's hard disk), which itself is only about one-thousandth of what it generates.<sup>103</sup> That, in turn, is dwarfed by the internet of things' byte torrent as every manner of device communicates with each other and us—five hundred zettabytes annually, each a million times the aforementioned petabyte.<sup>104</sup>

New tools will eventually help temper this flow, turning it to our purpose. More data often means less work and greater mastery. Fluorescent light sheet microscopes image at high resolution, producing large data files.<sup>105</sup> That increases the amount of data needing attention, but alleviates our tasks, allowing sharper images and more accurate diagnoses. In our daily lives, too, salvation often arrives through more data. Shifting from analog to digital photography, supercharged by omnipresent cameras in our pockets, has vastly increased the number of images. Digital photos dwarf yesterday's Kodak Instamatic snaps or Polaroids. Yet, the output is more easily storable, shareable, findable, and usable. Gone are millions of family albums, their dried-up adhesive mechanisms spilling out the photos on those rare occasions they are pulled off the shelf. Not to mention billions of slides in plastic cases, piled high in closets and never looked at again.

The legacy publishers have positioned themselves to capture the market for taming data. Now that disseminating content is contested and no longer an unchallenged source of profit, they are poised to go backstage into the bowels of the scientific enterprise to manage data as well. Accumulating, storing, organizing, analyzing, packaging, and otherwise mastering the data on which content is based is the new growth area for many publishers. Formerly a content provider, Elsevier has rebranded itself as an information analytics company.<sup>106</sup> With vast content already in house, it is now

moving back up the information chain to the headwaters of the scholarly undertaking, vertically integrating the entire enterprise.

Here, too, debate rages. Shall data be captured by the commercial houses, as content was? With storage practically costless, should not the data behind the results also be made public, allowing others to scrutinize and verify? The European Open Science Cloud, begun in 2018, is a forum where researchers can store data and make it accessible.<sup>107</sup>

In tandem, open-access activists have sought to rebrand the movement as open science, to indicate their expanding ambition. Open science includes not just research's final output but also its raw materials, data, field notes, lab journals, blog posts, and the rest of it.<sup>108</sup> Sometimes this is referred to as open scholarship, to embrace the humanities and social sciences as well. As we have seen, however, in these fields, data have different meanings and implications.

Early days, it is difficult to say much about open scholarship. Who are its main actors, and their interests? Scientists and their institutions are clearly players. But what about publishers?<sup>109</sup> Whether the public has a practicable interest in scholarship's backstage apparatus remains to be seen.





This is a section of [doi:10.7551/mitpress/14887.001.0001](https://doi.org/10.7551/mitpress/14887.001.0001)

# Athena Unbound

## Why and How Scholarly Knowledge Should Be Free for All

By: Peter Baldwin

### Citation:

*Athena Unbound: Why and How Scholarly Knowledge Should Be Free for All*

By: Peter Baldwin

DOI: [10.7551/mitpress/14887.001.0001](https://doi.org/10.7551/mitpress/14887.001.0001)

ISBN (electronic): 9780262373968

Publisher: The MIT Press

Published: 2023

The open access edition of this book was made possible by generous funding and support from the author



The MIT Press

© 2023 Peter Baldwin

This work is subject to a Creative Commons CC-BY-NC-ND license.

Subject to such license, all rights are reserved.



The MIT Press would like to thank the anonymous peer reviewers who provided comments on drafts of this book. The generous work of academic experts is essential for establishing the authority and quality of our publications. We acknowledge with gratitude the contributions of these otherwise uncredited readers.

This book was set in ITC Stone Serif Std and ITC Stone Sans Std by New Best-set Typesetters Ltd.

Library of Congress Cataloging-in-Publication Data

Names: Baldwin, Peter, 1956– author.

Title: Athena unbound : why and how scholarly knowledge should be free for all / Peter Baldwin.

Description: Cambridge, Massachusetts : The MIT Press, [2023] |

Includes bibliographical references and index.

Identifiers: LCCN 2022027103 (print) | LCCN 2022027104 (ebook) |

ISBN 9780262048002 (hardcover) | ISBN 9780262373951 (epub) |

ISBN 9780262373968 (pdf)

Subjects: LCSH: Open access publishing. | Scholarly electronic publishing.

Classification: LCC Z286.O63 B35 2023 (print) | LCC Z286.O63 (ebook) |

DDC 070.5/7973—dc23/eng/20220628

LC record available at <https://lccn.loc.gov/2022027103>

LC ebook record available at <https://lccn.loc.gov/2022027104>

10 9 8 7 6 5 4 3 2 1