

# Jefferson's Taper in the Digital Hall of Mirrors

*Paywalls, Data Walls, and the Progress of Open Access*

by WILLIAM B. MILLARD, PhD

Special Contributor to  
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In history's annals of bad guesses, the 1995 prediction in *Forbes* that the Internet would destroy academic publishing (particularly Reed Elsevier, as the world's largest academic publisher was then known)<sup>1</sup> stands alongside the Chicago *Daily Tribune's* "Dewey Defeats Truman" headline and Decca Records' rejection of the Beatles' audition on the grounds that "guitar groups are on the way out."

Instead of collapsing after online distribution appeared, commercial academic journals became an even bigger business, now worth an estimated \$25 billion in the United States alone. Major scientific publishers' return on investment is in the range of 35% to 40%, outstripping the comparable metric for the likes of Apple, Amazon, and Google, let alone firms in sectors less prone to monopolies and oligopolies than information technology.

The journal industry's profit margin has also inspired a steady stream of scathing critiques.<sup>2-4</sup> One of the most recent, the film *Paywall: The Business of Scholarship* (2018),<sup>5</sup> marshals greater than 70 authoritative commentators in a battalion of talking heads, denouncing commercial publishers as profiteers who have used high subscription prices, cable-service-style "big deal" bundling of journals, secretive bargaining

practices, and other mechanisms, particularly the familiar and much-resented paywall, to enrich themselves disproportionately to the detriment of global scholars, the economic health of libraries and universities, the free flow of information, and the public good.

It is unusual for a documentary to have measurable effects on the business performance of its subject. Still, the scholar-journalist behind the film is bemused by the possibility that his work is serving as a catalyst not only for expanded debate but also for tangible consequences. "Within the first 10 days after our film came out, there was a 13% decline in Elsevier stocks," noted *Paywall's* producer, director, and narrator Jason Schmitt, PhD, chair of communication and media at Clarkson University in Potsdam, NY. "UBS [the former Union Bank of Switzerland]," he added, "switched their designation from hold to sell."

## ROBBER BARONS AND ROBIN HOOD

Some fluctuations in market variables are transient; others may signal a sea change that *Paywall's* commentators and others regard as justified, long brewing, and inevitable. The open access (OA) alternative has been available for decades, at least since cognitive scientist Stevan Harnad's, MA, PhD, "subversive proposal" in the early 1990s<sup>6-9</sup>; physicist Paul Ginsparg's, PhD, 1991 founding of [arXiv.org](https://arxiv.org); the rise of the

Public Library of Science, raising the quality/prestige bar for OA journals; and related developments. OA has gathered adherents and institutional support without yet dislodging commercial journals. (One epiphenomenon of the OA movement, the proliferation of low-value, fee-based, often fraud-riddled "predatory journals," was discussed in these pages 5 years ago by Harnad and others.<sup>10</sup>) The same publishers that strike most of the *Paywall* commentators as problematic are also embracing the logic of OA: Elsevier\* publishes greater than 170 OA journals and greater than 1,850 hybrid journals, offers OA options in the categories of gold (publication in a fee-supported OA journal) and green (publication anywhere, with a copy self-archived in a repository) OA, and describes itself as "one of the leading open access publishers."<sup>11</sup>

Although the robber baron role for Elsevier in the film is clear, Dr. Schmitt acknowledged that the firm pursues an aim he and his interviewees share, the wide dissemination of knowledge, while operating under different assumptions about the status of knowledge as private property. He approached Elsevier for comments, he pointed out, offering "a 5-minute section of that film that would be 100% within their creative control, that I would have no jurisdiction over. But I think they felt it was in their best interest not to do that, and that's fine. If I was them, I'm sure I would make that same decision, and at the end of the day, Elsevier is full of really intelligent

\*To preserve editorial and commentator independence—journalism's traditional "church/state wall" separating the editorial and ownership sides of a publication—I purposefully refrained from consulting Elsevier, *Annals'* publisher, while informing commentators that this article would be written and edited without influence from the firm.

people that are trying to do good things.”

*Paywall* aims to extend the case for OA beyond the academic setting, addressing audiences not yet familiar with the origins of scientific publishing with the Royal Society or the anomalous economics of research. Reviewing *Paywall* in *The Lancet*, Richard Smith, CBE FMedSci, former editor of *The BMJ*, observed that the 13% decrease in Elsevier's share price may have had less to do with the film than with the coincident September 2018 launch of Plan S, a new requirement that all research funded by participating European public and foundation sources be published in OA journals or repositories by 2020.<sup>12,13</sup> The Wellcome Trust, the Bill and Melinda Gates Foundation, and other funders, Dr. Schmitt pointed out, are among institutions with similar policies.

Funders' pressure is one force driving scholarly communications toward OA. Another is the squeeze on libraries' resources, money and patience alike. Brandon Butler, JD, director of information policy at the University of Virginia Library (not a *Paywall* interviewee), observed that the high cost of journals in the science/technology/engineering/mathematics fields has unsustainable consequences across disciplines. “The humanities have just been squeezed really badly, in terms of budgets from libraries that can go toward supporting monographs,” he said. “So what you've actually seen is a huge divestment from monographs by libraries because funding has been sucked up by [science/technology/engineering/mathematics] journals.”

Some readers have also found alternatives to paywalls, legal and otherwise. In Germany and Sweden, where negotiations between Elsevier and the respective national research consortia Projekt DEAL<sup>14</sup> and

Bibsam<sup>15</sup> broke down last summer, researchers lost access to the firm's materials; their backup plans for access included interlibrary loans and requesting copies from authors. A faster method, farther outside the commercial publishing realm altogether, is Sci-Hub, the pirate archive established in 2011 by Kazakhstani hacker Alexandra Elbakyan.

Offering illicit access to the majority of the world's copyrighted scientific research<sup>16</sup> has put Elbakyan in the gunights of the legal departments of both Elsevier and the American Chemical Society, which have successfully sued her in US courts for multimillion-dollar damages; she is currently in hiding, dodging extradition.<sup>17</sup>

### THE DATA WALL MODEL: QUID PRO WHOM?

**P**aywalls may recede as a way for researchers and readers outside subscribing institutions to get access to scholarship, but another method—perhaps just as annoying and potentially insidious—has arisen in their wake. Lisa Janicke Hinchliffe, MS, professor and coordinator for information-literacy services and instruction in the University Library at the University of Illinois at Urbana-Champaign, has observed that OA materials frequently involve some variety of data wall: a request to create an account or obtain a “free” subscription, with a demand for an e-mail address or other contact information.<sup>18</sup>

Such a moment reveals the subtly transactional nature of an encounter in which no money formally changes hands: the reader still gives the publisher something of value, a combination of time and personal information. The latter will be used for data tracking, analysis, and reporting, processes that few readers

are aware of (even with the opportunity and inclination to read terms of service in fine-print legalese), and that none has the option of negotiating. If “data is the new oil,” as commentators on big data have noted<sup>19</sup>—valuable, but in need of processing to be useful—the data wall makes the reader of OA research an unwitting worker on the analytic oil rig, raises questions about who has the rights to its value, and creates potentials for spillage.

The concept of openness in information science, Ms. Janicke Hinchliffe emphasized, is far from binary and includes a considerable amount of nuance. To individuals of libertarian or anarchistic persuasions who offer Stewart Brand's well-circulated aphorism “Information wants to be free,” she recommends reading the “next phrase that came right after that... ‘Information wants to be free, but information also wants to be expensive.’”<sup>20</sup> The tendency of information to flow (often around legal borders) and its capability of being valuable (and thus associated with some form of price) are in constant tension.

Ms. Janicke Hinchliffe explicitly rejected the Sci-Hub approach that resolves the Brandian tension by wresting the public good of research out of the copyrightable-property paradigm by stealth. “Sci-Hub is a pirate site, and they are stealing copy,” she said. Data walls, less obstructive than paywalls and less adversarial than litigation, are potentially a legal, lower-friction, market-based solution to the problems *Paywall* spotlights. Yet in an online environment in which lapses in the protection of personal information are common, readers may be wary about various consequences of the transaction a data wall imposes, including the risks of theft of information.

“Libraries take great care to put effort into protecting your privacy,” Ms. Janicke Hinchliffe noted, “and so we may know what you accessed, but we don’t commercialize that.” Analytics firms and other parties seeking access to data—she cited insurance companies and attorneys as salient examples—have different aims. She conjectured that physicians, in particular, have grounds for caution. In situations in which medical outcomes are adverse and litigation ensues, would plaintiffs’ attorneys “be able to subpoena what articles you looked at on the Elsevier site? Every place you click that’s attached to you, you’re leaving a trail. And now maybe a physician could also use that to defend themselves and say, ‘No, look, I read every article that’s available on this topic.’ But the flip side is, they subpoena, and they say, ‘You didn’t even do any research on this topic.’ I am not one to spin out conspiracy theories, but I am going to ask the question of what happens when your access is being tracked on third-party platforms that may or may not have the same interest that you or your patients have.” Hospitals may be concerned that data tracking creates organizational liability as well. “We will never know,” she said, “until someone files a lawsuit.”

## THE PECULIAR CHARACTER OF LIGHT

The University of Virginia’s Dr. Butler looks to his university’s founder, Thomas Jefferson, for a key principle in the development of intellectual-property law: that ideas are nonexcludable social entities and, once communicated, cannot coherently be conceived as property at all. A much-quoted metaphor, which Dr. Butler cited in a recent debate over OA,<sup>21</sup> appears in Jefferson’s correspondence:

...If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of every one, and the receiver cannot dispossess himself of it. Its peculiar character, too, is that no one possesses the less, because every other possesses the whole of it. He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me.<sup>22</sup>

The unextinguished candle flame of an idea whose discoverer communicates it to others, according to the traditions and precedents of intellectual-property law, is beyond ownership. In this context, Dr. Butler also paraphrased Justice Louis Brandeis to the effect that “a fact once it’s discovered, and once it’s disclosed, is as free as air to common use.”<sup>23†</sup> Copyright law, Dr. Butler continued, separates factual knowledge from its particular expression: the latter can be protected, but the former cannot.

The Constitution’s copyright clause established temporary exclusivity not because ideas are their discoverers’ absolute property, such as land or personal possessions, but on consequentialist grounds to create practical incentives.

“From a copyright-law perspective,” Dr. Butler added, “the only reason to let someone control the circulation of information is...to give them a reason to create it. And so this has been the justification for

<sup>†</sup>The verbatim quotation from Justice Brandeis is “The general rule of law is, that the noblest of human productions—knowledge, truths ascertained, conceptions, and ideas—become, after voluntary communication to others, free as the air to common use.”

copyright for 300 years, since the Statute of Anne in 1709.”

Overcoming the opposition of commercial publishers, who are “just screaming” about the European Plan S, will require some form of coercion. By analogy to the transition to renewable energy, Dr. Butler sometimes sees publishers as “similar to the petroleum companies. Exxon is absolutely investing in all kinds of different modes of energy generation, but they are not going to switch until they’ve got every last drop of oil out of the ground.” The data wall model, he predicted, represents a transitional stage among various forms of resistance to a fully OA future on the part of commercial publishers.

## WE CREATED IT: LET’S TAKE IT OVER

What would a system that transmitted, magnified, and spread the light of research as freely and rationally as possible, rather than controlled it with coin-operated lampshades, look like? Dr. Butler pointed to the arguments of Björn Brembs, PhD, professor of neurogenetics at the University of Regensburg in Germany, a *PLoS One* academic editor, and a proponent of replacing the current journal model altogether. Dr. Butler summarized Dr. Brembs’s position succinctly: “Journals are bad infrastructure. Why don’t we have our own infrastructure? It could be so much better if we built it ourselves. It would belong to us. I find that vision really compelling.... The odds of our successfully protecting [intellectual and democratic] values go up if we can take that infrastructure out of the hands of commercial entities. That is, if we consider the sharing and publication of knowledge to be something that the academy does for itself, and is responsible for, the odds of our

following our values in protecting academics, and protecting academic freedom, are much better than they will be if it's a publicly traded company that's beholden only to its shareholders."

Dr. Brembs spoke of his recommended paradigm in terms that resemble those of [arXiv.org](https://arxiv.org), Public Library of Science, Brazil's Scientific Electronic Library Online, and similar repositories, with a nod to Harnad's subversive proposal, but with additional features that streamline the posting and assessment of material. The chief challenge, Dr. Brembs emphasized, is not wall-obstructed access. Through existing and emerging OA mechanisms, he found that researchers' and readers' inability to obtain articles is a diminishing problem.<sup>24</sup> (His recommended mechanisms include Sci-Hub,<sup>25</sup> whose value as a civilly disobedient, Robin Hood-style liberator of material that should never have been imprisoned by copyright in the first place, he argued, far outweighs its possible offenses in acquiring the material. Absent independent confirmation of accusations of phishing and hacking, he said, "I would take all of these allegations with a grain of salt, just as the poor person on the street who just got some money from Robin Hood would also ask twice if [the Sheriff of Nottingham] would put up an announcement saying that Robin Hood, while he was stealing money, broke some guard's nose.") The greater problem, Dr. Brembs said, is that the commercial journal system produces so many irrational and perverse incentives.

A key observation, Dr. Brembs said, is that the work appearing in high-ranking journals (as measured by Impact Factor, the Clarivate Analytics [formerly Thomson Reuters] instrument that he and others regard as grossly flawed,<sup>26</sup> but that remains a commonly recognized metric of journal rank) is more likely, not less, to be low in quality when assessed by

criteria such as retraction rates, statistical power, and reproducibility.<sup>27</sup> Incentives to publish in the name-recognition journals skew more toward novelty and riskiness than methodologic rigor, he observed; hence, the recurrent crises of irreproducible results and embarrassing, attention-getting retractions. Researchers in search of high-visibility relative-risk percentages and *P* values are massaging their data beyond responsible or reproducible interpretation.

Given this "negative correlation" between journal rank and article quality, Dr. Brembs would abandon journals as we know them in favor of an OA, open-source infrastructure that would allow researchers to assess the quality of articles through a badging system, creating a quantitative long-range review process that would answer questions that the existing arrangements leave in the dark, such as the outcomes of article-acceptance decisions. "The level of functionality that we currently have for the content that we create is so abysmally low," Dr. Brembs asserted, "it's almost impossible to make it any worse. So almost any modernization will just make it easier and better."

He recognizes that certain features of existing journals, such as the personal vision of editors who have earned authority with readers and peers, are likely to be valued enough to survive the transformation, perhaps as optional "human-based filtering" at a premium; no algorithm is likely to replace an Arnold Relman, a Fiona Godlee, or a Drummond Rennie.

At the heart of the dissatisfaction Dr. Brembs, Dr. Butler, and other OA proponents express toward journal publishers is the question of whether those organizations add any real value to justify their extraordinary revenue. Perhaps by erecting paywalls blocking the flow of knowledge and then data walls commoditizing information

about readers, publishers serve as today's equivalent of the original, nonmetaphorical robber barons, the late-13th-century feudal landowners along the Rhine who charged extortionate tolls for shipping past their land. The obstruction of Rhine shipping was unsustainable; the obstruction of scientific communication may turn out likewise.

"If we really changed the way we think about information and academic values that feed that information ecosystem," Dr. Butler suggested, "we'd see a lot of changes, not just getting out from behind paywalls. We might see a different kind of peer review. We might see a different kind of promotion and tenure process. A lot of those things need to change. The paywalls are just an egregious outgrowth of this pretty messed-up system."

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# Climate Change and the Emergency Department

*Hospitals Shrink Their Carbon Footprint, Prepare for Climate Refugees*

by ALAN HUFFMAN

Special Contributor to  
*Annals News & Perspective*

**A**s Renee Salas, MD, MS, was treating an elderly woman in the emergency department (ED) at Massachusetts General Hospital in the

fall of 2017, the patient revealed that she had been displaced by the recent devastation wrought by Hurricane Maria in Puerto Rico.

The woman had come to the ED straight from the airport, with a single piece of luggage and a worn plastic

bag full of empty medication bottles—medicine that she hadn't taken for days. Most hospitals in Puerto Rico were out of commission, largely because of power outages, or inundated with injured and sick people. Similar scenarios would later play out in California during an unprecedented outbreak in wildfires.

It occurred to Dr. Salas that this was the shape of things to come. "It's not going to be just climate refugees in far-off countries," she said. "Already, climate change is displacing Americans."

An emergency physician at Massachusetts General Hospital and Harvard Medical School, and a physician-investigator of climate change and