



On Publishing and the Sneetches: A Wake-up Call?*

by Peter Walter and Dyche Mullins

Two institutions—learned societies and scientific journals—midwived a scientific revolution in the 17th century that still dominates our professional lives today. Learned societies like the ASCB remain relevant because they provide forums for sharing results, discussing the practice of science, and projecting our voices to the public and the policymakers. Scientific journals still disseminate our work, but in the Internet-connected world of the 21st century this is no longer their critical function. Journals remain relevant today almost entirely because they provide a playing field for scientific and professional competition: To claim credit for a discovery, we publish it in a peer-reviewed journal; to get a job in academia or money to run a lab, we present piles of these published papers to universities and funding agencies. Publishing is so embedded in the practice of science that whoever controls the journals controls access to the entire profession. It is, therefore, worth examining to whom we have entrusted the keys to the kingdom of science.



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A New Relationship between Scholars and Publishers

Non Solus (Latin for “not alone”) reads the banner of a woodprint adopted as a logo in 1620 by the House of Elsevier, a family of Dutch booksellers. The print shows a sturdy elm tree that supports a growing vine, which wraps around the trunk and entangles the branches (Figure 1). The vine bears fruit, which a solemn scholar harvests with ease. In 1880 an unrelated publishing company adopted the Elsevier name and its logo, which according to its website: “...represents, in classical symbolism, the symbiotic relationship

between publisher and scholar. The addition of the *Non Solus* inscription reinforces the message that publishers, like the elm tree, are needed to provide sturdy support for scholars, just as surely as scholars, the vine, are needed to

produce fruit. Publishers and scholars cannot do it alone....”¹

Today, this 400-year-old logo no longer reflects reality. As scholars, we now *could* take over the means of fruit production—in fact, we already do most of it. Like our intellectual ancestors hundreds of years

ago, we still conceive and execute the research, and we write our papers. But now with the advent of electronic word and image processing, we also create our own graphics, proofread our own text, and in some cases typeset it. More significantly, the Internet enables us to easily (and instantly) disseminate our work around the world. Publishers still help provide a measure of quality control by orchestrating the peer review process, but here again it is scholars who do the actual work of reviewing papers. It is thus surprising that despite the diminished (and arguably dispensable) role of the publishing industry, our community remains slavishly committed to century-old traditions that, we will argue, are illogical and in many cases exploitative and harmful to our community.

Of course Elsevier is only one example of several large for-profit publishers of scholarly journals. Members of the for-profit publishing industry subscribe to an ingenious business plan. In an insightful satirical essay, Scott Aaronson describes a fictitious computer game company built on principles similar to those of the for-profit publishing industry, exploiting its patrons to contribute their products and labor for free.² In Aaronson’s imaginary scenario, game developers donate their games to the company because they need its “seal of approval” for their games to be recognized. Experts test and debug the games for free when told that it’s

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*This column reflects the opinions of the authors about commercial academic publishing.

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Every paper we submit is a singular product, and every academic library has an obligation to provide access to it.



Figure 1. The trademark and logo of Elsevier (AD 1620)

their “professional duty” to do so. So for only trivial investment in the products, the company can charge customers high rates for the games it now owns. Aaronson concludes: “On reflection, perhaps no game developer would be gullible enough to fall for my scheme. I need a community that has a higher tolerance for the ridiculous—a community that, even after my operation is unmasked, will study it and hold meetings, but not ‘rush to judgment’ by dissociating itself from me. But who on Earth could possibly be so paralyzed by indecision, so averse to change, so immune to common sense? I’ve got it: academics!”

The situation is amplified by the fact that publishers have created *de facto* monopolies. In this industry, normal market forces that control pricing through competition are entirely absent. Every paper we submit is a singular product, and every academic library has an obligation to provide access to it. Otherwise, we, the scholars, cannot perform our jobs properly, and it is the libraries’ role to support our scholarship. Because of this built-in mandate, publishers can increase prices virtually at will (at least, until library budgets are exhausted), which is strongly supported by data that show the increase in subscription cost far outpaces other market indicators.³ The only control in place is depressingly reminiscent of a parasite–host relationship: To ensure its own survival the parasite must not kill the host. Why having a monopoly on the product combined with a captive market for it does not violate antitrust law is unclear to us.

To further compound the issue, we blithely accept the fact that most publishers demand that we sign over the copyright of our work, allowing them to control access to it and maximize their profits. If we were to imagine an updated logo befitting the current business

practices of for-profit publishers, it might look something like Figure 2. The elm tree has grown, as the for-profit publishing houses now have grown into gigantic multinational conglomerates. The fruit of knowledge now hangs out of reach, even when we are stretched on our tippy toes. For access we need to use the ladder that is gated and festooned with the banner whose motto has morphed into *Non Gratis* (“not for free”). The role of the tree changed diametrically, from disseminating knowledge to controlling access. And yet, we happily keep nourishing the tree. Just as Scott Aaronson describes, we work for them for free in producing the work, reviewing it, and serving on their editorial boards.

What Publishing Really Costs Us

The magnitude of the profits of the major commercial publishers is astonishing. As a whole, the industry made more than \$10 billion in 2015, with profits for the largest players, such as Elsevier, Springer, Taylor & Francis, and Wiley, exceeding 30%.⁴ Elsevier alone, a publicly held company and the world’s largest academic for-profit publisher, reports in its 2014 annual report revenues of \$3.38 billion for its science/technology/math branches with an operating profit of \$1.13 billion.⁵ This calculates to a profit margin of 33%. In other words, each time we pay an article processing charge of \$3,000, \$1,000 goes to Elsevier and its shareholders.

Putting these numbers into perspective reveals the magnitude of the problem: Elsevier’s annual profit of \$1.13 billion corresponds to ~1.3-times the entire annual budget of the Howard Hughes Medical Institute (HHMI), the major philanthropic funding agency for biomedical research in the United States, which generously funds some 300 investigators. The CNRS, the major funding agency in France, spends €30M/year on journal subscriptions (~20% of its entire annual budget allocated for consumables and small equipment).⁶ This money is effectively a surcharge, or tax, on scientific research imposed not by a government but by a for-profit industry. Imagine for a moment how much research could be carried out using these resources if they were channeled back into our academic enterprise.

Most of us pay publication charges from our grants, that is, from taxpayers’ money. And then the libraries, again funded indirectly through the taxpayers, pay again for access. In open-



Figure 2. The authors' satirical view of the Elsevier logo: The tree has grown (AD 2016).

access models of our for-profit publishers, things are hardly any better. Elsevier's *Cell Reports* charges \$5,000 to publish an article. Thus, while foregoing the library subscription income, the shareholders' profits are well preserved in the aggregate of their portfolio. But at least open access allows us to evaluate the price tag up front. Scientists can decide on a case-by-case basis whether any particular journal is worth that much money, and publishers cannot lock away our papers in their archives, holding them ransom and charging our community for access over and over again.

In contrast to for-profit publishers, our university presses and society journals use the more modest profits generated from their journals to leverage many positive initiatives that enrich our communities, such as the prestigious EMBO Fellowships that would not exist without the revenue brought in by EMBO journals, the impactful AAAS Science and Technology Policy Fellowships built on leveraging the income generated by *Science* magazine, and the various activities of our Society enabled by ASCB's *Molecular Biology of the Cell* (MBoC). These enterprises add to the larger good of our community values, and they deserve our support and volunteered labor.

Why Do We Resist Change?

All of the issues mentioned above have been raised *ad nauseum*. They have caused flurries of outrage across a range of academic communities, yet the issues persist in the face of boycott attempts and editorial board resignations (e.g., reference 7). Why do we not only tolerate an antiquated and patently exploitative publishing system, but actively support and promote it? Why is our community so resistant to see through these issues and

effect meaningful change? There are a number of reasons that contribute to maintain the unfortunate *status quo*.

First and foremost, we as a community have fallen into the lazy and lamentable habit of using journal titles as yardsticks to measure our accomplishments. We pretend that this is a rational strategy by pointing to metrics like the journal impact factor, widely viewed as a false metric tailor-made to be gamed by high-profile journals⁸ that unfortunately now dictates the careers of our young scientists. In reality, the importance of publishing in high-profile journals arises entirely from within the scientific community itself. There is no intrinsic value to publishing our work in such journals; there is only the value that we, collectively, decide to place on it. As long as the "gold-stars" associated with authoring papers in, for example, *Cell* and *Nature*, are—or even are just perceived to be—significant drivers in hiring, promotion, and funding decisions, Elsevier, Springer, et al. will remain untouchable forces. In his wonderful children's book *The Sneetches*, Dr. Seuss powerfully illustrates the impact of stars (in this case blue) in an imaginary society. The Sneetches that inhabit this society come in two castes: some have blue stars affixed to their bellies and some do not. The Sneetch society is stratified by this attribute:

When the Star-Belly children went out to play ball
Could a Plain Belly get in the game...? Not at all
You only could play if your bellies had stars,
And the Plain Belly children had none upon thars⁹

As the story goes, a lot of money is made by those who offer to print stars onto the bellies of those lacking them, which as status symbols are just as meaningless as a paper in a high-impact factor journal on our CVs as an indicator of signature contributions. What desperately needs to be done is to eradicate the misleading metric of the journal impact factor, and this movement is well underway. Alternative, article-based (i.e., not journal-based) metrics are gaining hold and acceptance as an improvement, although even this is not enough.^{10,11} One of us (PW) serves on a grant evaluation panel for the European Research Council (introduced in the President's Column in the preceding issue of this *Newsletter*¹²). In our panel it is the stated and adhered to policy that we will not consider where a paper is published. Rather, in our evaluations we assess its real impact in a field. Change of this sort and defiance of the

Why do we continue to uphold an antiquated and patently exploitative publishing system?

status quo is badly needed in all committees and panels that make decisions that impact the future of our next-generation scientists, even if it entails a bit more work. Even if the highest-profile journals may not be the biggest money-makers for the publishers, their business practices of bundling subscriptions and creating ever-expanding suites of high-profile spin-off journals rely on them as very profitable hooks for maintaining market share.

Second, we as a community lack the will and the courage to act together for change, even change that would improve our lives. We could, for example, overhaul the publishing system overnight, by sending our work exclusively to non-profit venues that provide either immediate open access or that return their revenues to the scientific community. Journals like *PLOS*, *eLife*, and *MBoC* provide arguably better standards of peer-review than for-profit journals and unarguably better access—namely *free access either immediately or soon after publication* for anyone with an Internet connection. The only thing these journals still lack is our highest stamp of approval. And there's the rub! As long as a significant fraction of the research community remains in awe of vanity for-profit journals, these journals will retain their hold on the keys to the kingdom. We are evolutionarily programmed to nourish and protect our young and many of us continue to publish in journals of questionable ethics because: "I/my student/postdoc need(s) to publish in such a journal to get a promotion/job/grant." As a community, we remain in thrall to these magazines. We may imagine ourselves to be rational, gutsy, paradigm-changing experimentalists who go where no one has gone before, but in reality we are a conservative community to which change does not come easily. There is hope for gradual change and enlightenment, but all of the rational and well-reasoned cries of outrage have not led to a revolution.

Third, the beneficiary of the current system is a multibillion-dollar industry whose influence is so strong that the institutions funding our research are unwilling or unable to counter it decisively. The research community itself may lack the courage to stop publishing in for-profit journals, but public funding sources like the National Institutes of Health (NIH) could make this change overnight by demanding that all publicly funded work be made freely available immediately or shortly after publication. So could the other major funding agencies around

the world such as the HHMI, the Wellcome Trust, the CNRS, and the Max-Planck-Institutes. Instead of removing the industry-imposed tax on research, however, our funding institutions reached compromises that allow for-profit publishers to retain exclusive rights to charge for access to publicly funded work for one year (e.g., see reference 13). With so many accessible publishing options available is there really a compelling need to compromise on this issue? Akin to those politicians who deploy demagogic talents to convince national electorates to vote against their own interests, for-profit publishers bring enormous resources to bear and "convince" policy makers, funding agencies, and researchers that their services are invaluable, and that their practices and profit margins are fair and justified.

Fourth, the publishing landscape is complex. It is imperative for us to adhere to our academic mission of making sure that scientific contributions are properly reviewed and refined so that our published work represents reliable, true advances of knowledge—to the best of our communal ability to judge. For that, we have accepted a communal responsibility, reflected in the many altruistic ways we volunteer our time and effort. These are powerful traditions that we deeply value. It is not always easy to see clearly when these values are being abused. Perhaps it is this that allows for-profit publishing companies to continue to flourish with a business model that exploits and manipulates our community values for financial gain.

Fifth, the editors that work for journals run by for-profit publishers are not our enemies. These editors, many of them talented scientists trained in our own labs, learned to recognize good science, to identify faulty logic, and to distinguish significant discoveries from incremental advances. We value them as colleagues and, for the most part, they do their best to handle submissions fairly while upholding the prestige of their respective journals. Yet, some have become corrupted by their masters and act more as powerbrokers judged by their efforts to maximize the journals' impact factors rather than their work as scientists and mentors practicing the art of rational, evidence-based decision-making.

This list describes a few of the many reasons why we put up with unnecessary and exploitative practices of for-profit scientific publishers. Perhaps evolutionary genetics provides a relevant lesson: Traits that are

Perhaps evolutionary genetics provides a relevant lesson: Traits that are harmful to an entire population can persist for long periods of time when they provide individuals in that population with a survival advantage.

harmful to an entire population can persist for long periods of time when they provide individuals in that population with a survival advantage. So, how do we change the system?

How Can We Effect Change?

Obviously, we cannot expect publishers themselves to initiate significant change. The executives of for-profit publishing companies are obliged to maximize profits, which in this case means extracting publicly and philanthropically provided resources from the scientific community. They cannot suddenly abandon their fiduciary responsibilities and begin plowing profits back into universities or the research community. The evolution from symbiont to parasite is complete and irreversible.

What is left is for universities, funding agencies, and (most importantly) the research community to wake up. As with climate change, it may require drastic consequences to galvanize us into action. In the United States, state and national contributions to public universities have been declining since the early 1990s,¹⁴ while the money that universities spend on subscriptions to academic journals has risen far faster than other market indicators.¹⁵ Something has to give. In fact, the wake-up call for the University of California (UC) system came in 2003, when Elsevier, in an attempt to squeeze higher online subscription rates out of the UC system, cut-off all electronic access to its journals. We (and our students and postdocs) *literally* could not read our own papers! After the threat of a large-scale boycott (which was covered in a previous *ASCB Newsletter*¹⁶), Elsevier eventually struck an undisclosed compromise. Unfortunately, this deal produced no lasting change and likely provided a useful template for dealing with subsequent university revolts. Earlier this year, for example,

a threatened boycott by Dutch universities of Elsevier journals was averted with Elsevier making small concessions that allow a fraction of papers from Dutch scholars to be published in an open-access format.^{17,18}

What can we as individuals do to promote change? One obvious action that would help weaken the grip of the for-profit publishing industry on our community would be, whenever reasonably possible, to decline to provide our free labor. One of us (PW) for example, with very few exceptions that can be counted with the fingers on one hand, has not published in and not reviewed for any Elsevier journal for the last 13 years. What is most puzzling is a lack of more widespread anger in our communities regarding the degree of exploitation and abuse by for-profit publishing enterprises that we not only tolerate, but accept and support. Rather, as Scott Aaronson points out later in his article, “[w]e support the enterprise by reviewing and by serving on editorial boards without compensation, regarding these duties as a moral obligation.”²

Starting small with individual actions helps with another malady in our profession: the constant struggle to maintain a good life–work balance. Imagine, for example, what you could do with four hours. You could either review a paper and put money into the pockets of canny investors, or you could spend some quality time with your family, go for a walk, or perform some unpaid community service that actually makes the world a better place. If you really want to review that paper, there is another strategy that could turn the ethical dilemma into a win–win situation (see Box 1).

One symptom of scholars’ frustration with restricted access to journals is the emergence and widespread use of illegal download sites that provide free access to millions of copyrighted publications.¹⁸ Just as Napster and Bit Torrent

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Dear Editor,

Thank you for inviting me to review this work. I will be happy to do so, but please be advised that I charge \$400 per hour [optional: and I read rather slowly].

Please confirm that this arrangement is acceptable to you.

Sincerely yours, ...

Box 1. Suggestion for a reply when asked to review for a for-profit journal. Note that the suggested rate for professional advice is a bargain. It would be very hard to find a lawyer to work for this rate for a for-profit enterprise.

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servers forced a reorganization of the music industry—which by contrast to the for-profit publishing industry can legitimately claim to defend royalties paid to artists—sites like Sci-Hub and LibGen pose a significant challenge to the *status quo*. The original motivation for creating Sci-Hub and other illegal download sites was to provide access to scientific literature for scholars in the developing world. Current data, however, reveal that the per capita usage of these sites is comparable in affluent countries, indicating the magnitude of worldwide demand for access to the literature.¹⁹

The authors of this article are old enough to remember the end of the Cold War. One of us (PW) grew up in post-war West Berlin, embracing the anti-authoritarian culture of the era; the other (DM) studied for a time at the University of Leningrad in the days leading up to Perestroika and the collapse of Soviet communism. So, with the reader's indulgence, we would like to echo the call of a past U.S. president to declaim:

COLLEAGUES, TEAR DOWN THAT TREE!

And if we scientists fail to tear it down in one blow, then let us at least open our eyes and continue to chop away at it. The end goal seems obvious: The knowledge that we produce in our publicly funded works belongs to humankind and must not be locked up behind pay-walls—newly submitted papers should be open-access and older ones open-archive. Our real challenge is to find the paths that get us there. But major change can happen, even if it seems impossible to imagine now. The Berlin Wall no longer stands, and we are certain that—if we put our hearts into it, embrace healthy values, and eradicate bad ones—scientists, learned societies, and scientific journals can invent new, powerfully symbiotic relationships.

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