How Green Is This Paper?

By Toby Miller

Abstract

The increasing governmentalization and commodification of knowledge are putting intense pressure on scholars to write and publish more, and in accordance with conventions that are not of their own making, due to benchmarks of success set by the applied sciences that suit business and the state. These tendencies are also producing a potentially unsustainable environmental burden that may be increasing, not decreasing, as we move more and more into an online publishing world. This recognition leads to three provocations: 1) There is too much scholarly publication to keep up with, and too much pressure to publish; 2) The future of all academic publishing will largely be determined by the sciences; and 3) We must consider the relative merits of publishing electronically rather than on paper in terms of the environment—in other words, asking "how green is this paper?"

Key words: govermentality; commodification; over-production; scholarly publishing; environmental impact

How Green Is This Paper?

Research academics love to publish.[1] The best I know seek three groups to set agendas for their work and read it: other scholars, the general public, and stakeholders, such as policymakers and social movements. Undertaking and disseminating such research is easier since the advent of the worldwide web, but it has become ever more tightly governed by the attitudes of bureaucratic evaluators and the restraints of capitalism, in the form of intellectual property. Publishing is in many ways less a pleasure and more a task—a metrication rather than a passion, an act of obedience, not knowledge—and driven by bureaucratic fiat as opposed to autonomous choices of topic and outlet.

Clearly, the utopias of free inquiry and communication, both seemingly enabled by the internet, have homologous dystopias of ownership and control. That awkward dynamic is far from new, as I shall explain, but it comes with a particular political economy in our neoliberal conjuncture of intensive governmentalization and commodification of knowledge and pressure on scholars both to write and publish more and to do so in accordance with conventions that are not of their own making, due to benchmarks of success being set by applied sciences to suit business and the state. It also produces a potentially unsustainable environmental burden that may be increasing, not decreasing, as we move into an online publishing world.

Utopia and Dystopia

The tendency to regard each emergent medium of communication as awe-inspiring and world-changing relies on recurring myths of technological power. The long history of this fetish is evident as far back as Socrates' dialogue with Phaedrus (Plato 2008).

Socrates referred to the 'propriety and impropriety of writing.' He related the story of an Egyptian king complaining to the god who had invented the new art that it 'will create forgetfulness in the learners' souls, because they will not use their memories; they will trust to the external written characters and not remember of themselves.' The flipside of this was a more demotic, less hierarchical worldview, of course—the word would make people free, as they became able to tell their own stories and promote their own priorities.

In 1620, Francis Bacon declared that printing, alongside gunpowder and the compass, had 'changed the whole face and state of things throughout the world' (1854). By the 19th century, it was a commonplace that books contained the entirety of human knowledge, which was therefore available to all those who could read. A utopian discourse about this notion of free information has recurred ever since with the advent of each communications innovation, alongside dystopic corollaries.

The latest media technologies are said to obliterate geography, sovereignty, and hierarchy in an alchemy of truth and beauty that is ideal for scholars wishing to spread the word. Two and a half billion research papers are downloaded each year,

Google Scholar trawls well over a hundred million manuscripts, and we now see collaborations where the list of an article's authors and institutions can take up more pages than the manuscript itself—my current record viewed had over three thousand writers of a short physics essay (Ware and Mabe 2015; ATLAS Collaboration 2010).

A deregulated, individuated, technologized world makes consumers into producers, frees the disabled from confinement, encourages new subjectivities, rewards intellect and competitiveness, links people across cultures, and allows billions of flowers to bloom in a post-political cornucopia. It is a bizarre utopia. People fish, film, fornicate, and finance from morning to midnight. Consumption is privileged, production is discounted, and labor is forgotten. True believers love to refer to the scholars participating in this world as learning to share (McKenna 2015).

Powerful communications institutions cleave to themselves a sense of universal enlightenment. So Facebook features "Peace on Facebook" and claims the capacity to 'decrease world conflict' through intercultural communication, while Twitter modestly announces itself to be 'a triumph of humanity' ('A Cyber-House' 2010). *Time* magazine exemplified this love of a seemingly immaterial world when it chose "You" as 2006's "Person of the Year," because "You control the Information Age. Welcome to your world" (Grossman 2006). On the liberal left, the *Guardian* placed someone called "You" at the head of its 2013 list of the hundred most important folks in the media ('Media Guardian' 2013).

Given the technology and the will, all should therefore be well in publishing for public knowledge. But it's not, because of fatal flaws in the utopic predictions made for cultural and communications technologies and shifts in the political economy of scholarly publishing.

The principal fatal flaw is that machinery and purchasing, not democratic political-economic activity, is taken as a guiding light in such utopias. The current favorites are technology and consumption, rather than activism and citizenship; bureaucratic forms and norms, not research and autonomy. The wonderfully named Progress and Freedom Foundation's *Magna Carta for the Information Age*, for instance, proposes that political-economic gains made for democracy since the 13th century have been eclipsed by technological ones:

> The central event of the 20th century is the overthrow of matter. In technology, economics, and the politics of nations, wealth—in the form of physical resources—has been losing value and significance. The powers of mind are everywhere ascendant over the brute force of things. (Dyson *et al.* 1994)

The Foundation has closed its doors, no doubt overtaken by progress, but its ahistorical Whiggish discourse of unfurling liberty for all continues to ring loudly in our ears, tinnitus-like.

George Orwell accurately described technologically determinist fantasies about forms of communication seventy years ago. His words resonate today, and with the same arid irony that first animated them (1944):

> Reading recently a batch of rather shallowly optimistic "progressive" books, I was struck by the automatic way in which people go on repeating certain phrases which were fashionable before 1914. Two great favourites are "the abolition of distance" and "the disappearance of frontiers." I do not know how often I have met with the statements that "the aeroplane and the radio have abolished distance" and "all parts of the world are now interdependent"

The real power resides not in the seeming autonomy granted to scholars by internet publishing but in the dominant audit culture of many university systems and the concentrated power of for-profit publishers. Since returning to the UK after thirty years, I have been astonished by the authority exercised by bureaucrats, the complicit and credulous conduct of faculty, and the near-unanimity of will directed towards state norms of measurement and faith in what are deemed to be corporate forms of life. The same experience attends my renewed experiences in Australia. I am also staggered by the mergers that see a few publishing companies devouring profits from the labor of faculty who have been driven by bureaucrats to over-produce.

Provocations

I have three provocations about academic publishing:

1) There is too much scholarly publication to keep up with, and too much pressure to publish

2) The future of academic publishing will largely be determined by the sciences; and

3) We must consider the relative merits of publishing electronically rather than on paper in terms of the environment—in other words, asking "how green is this paper?"

First Provocation: There is too much scholarly publication to keep up with, and too much pressure to publish

This point may seem obvious to many critics, but it is worth repeating, because the systems of value that dominate research schools assume there can never be too much publishing. Secondly, putting some numbers to the argument strengthens it.

In 1870, just 840 papers were published on the topic of mathematics. A hundred and twenty-five years later, the annual number was 50,000. Scientific output doubles every five years, and the number of patent applications filed in the major centers—the US, Japan, and China—increased by 40% between 1992 and 2002. The total is about a million a year, a quarter of which are international (Miller 2012, World Intellectual Property Organization 2014). In 2006, 1.3 million scholarly articles appeared in 23,750 journals. By the end of 2013, there were 26,529 journals in print and 4,267 solely on line, which represented an average annual growth rate of 3.5% since 1800. Perhaps a quarter of these publications are classified within the

humanities (Colquhoun 2011, National Science Communication Institute 2015: 28).

In 2004, worldwide sales of English-language science, technical, and medical serials were conservatively valued at UK£5 billion. The International Association of Scientific, Technical and Medical Publishers estimates that there were:

> about 28,100 active scholarly peer-reviewed English-language journals in late 2014 (plus a further 6450 non-English-language journals), collectively publishing about 2.5 million articles a year. The number of articles published each year and the number of journals have both grown steadily for over two centuries, by about 3% and 3.5% per year respectively, though there are some indications that growth has accelerated in recent years. The reason is the equally persistent growth in the number of researchers, which has also grown at about 3% per year and now stands at between 7 and 9 million, depending on definition, although only about 20% of these are repeat authors. (Ware and Mabe 2015: 27)

The US National Institutes of Health support approximately 65,000 published papers annually. The average number of articles that scientists read each year was 150 in 1977, 216 in 2003, and 270 in 2014 (Ware and Mabe 2015). Three decades ago, a former director of Yale's library system put it this way: 'we're drowning in information and starving for knowledge' (Campbell 1985).

Today's researchers experience simultaneous, potentially contradictory, desires: citational obedience, innovation, application, bureaucratic control, and dominance of the English language. This is part of the deprofessionalizing proletarianization of scholarly life. It is easy to complain about it—and easy to mock such complaints—but the point is worth making nonetheless.

I currently undertake scholarly mentoring for faculty based in Australian, British, and Colombian universities, and formerly did so in US ones for a decade and a half. I'm struck by the pressures they confront from state and university bureaucrats and themselves to undertake instrumental, careerist publishing. There is a particular desire on the part of faculty in Latin America to publish in Anglo journals legitimized by what they call 'ISI,' the *Index of Scientific Periodicals*.[2] This pressure blends with, and is sometimes enabled by (sometimes leavened by) a love of inquiry. It can also overdetermine that love: in China, corrupt research is reportedly rife due to publishing incentives that stretch all the way to favorable housing deals (Qiu 2010), though I personally have benefited from wonderful environmental research done there that is clearly independent. The conjuncture also presents new, ghastly software opportunities such as *Publish or Perish*, which promises to forward your tenure prospects regardless of the esteem of where you publish (http://www.harzing.com/pop.htm).

In all these countries, I see the passion for knowledge and the wish to share it with the public being overrun by measurements of control that are beloved of the bureau. The loss of autonomy and the rise of obedience are prominent and disturbing. The rush to publish is occasioned not so much by the opportunity provided by

new forms of communication as by the will to direct faculty in specific directions and govern their work lives.

Second Provocation: The Future is About the Sciences

The sciences have long been dominant forces in expenditure and decision-making at Research One universities. As corporations disinvest in research and development, universities have become more and more important as sites of innovation—this is spectacularly true over the past decade, with the rise of nanotechnology (World Intellectual Property Organization 2015). Such a tendency increases the expectations of governments and educrats alike that research will generate commodifiable products.

At the same time, science is soaking up larger and larger slices of college resources. This has a notable effect on publishing, where science journal pricing continues to spiral, destroying the ability of university libraries to buy books in the numbers they used to do. For example, an annual subscription to the monthly *Journal of Comparative Neurology* costs US$28,787 (Lambert 2015). As a consequence, several humanities and qualitative social-science areas are having to confront their investment in the monograph, notably the Modern Language Association, since literary criticism and theory doesn't sell (the collapse of the market is blamed by many publishers on prolix prose and an overreaching by critics who anoint themselves experts on everything). In addition, the National Endowment for the Humanities, which underwrote the publication of hundreds of books from the mid-1970s, was crippled by the Republican Party from the mid-1990s, eroding a routine means of supporting humanities books (Miller 2000). Finally, library budgets have swung radically away from buying books and towards subscribing to databases (Miller 2012). And today, governments, most importantly the US Federal administration, are refusing to keep paying from the public pot for the profit of private presses via grants for research, professorial salaries, and library acquisitions—all minus public access (McKenna 2015).

Alongside these financial pressures, many university presses object to the onus of US Research One tenure decisions being placed on their shoulders. If junior professors get a book contract, they get tenure; if they don't, they're shown the door. The collision of these two economic drives—for quality presses to save money and junior faculty to secure jobs—has produced the idea of accepting books for publication but not actually publishing them in the old-fashioned way; they remain in electronic limbo except for the few copies that need to be printed to satisfy tenure and promotion committees and loved ones. As you may have noticed, for-profit houses like Routledge and Palgrave are signing up almost any proposed monograph. That high-volume, occasional-hit stratagem is unlikely to continue for long.

We are in a truly political-economic crisis, with interlacing monetary and governmental components. Author-pays practices are therefore on the rise. Inevitably

controversial, in one sense they formalize the reality that academics provide publishers with labor for free or below cost, especially as manuscript reviewers for journals. This has been accepted in science circles for a long time; many journals outside the humanities and social sciences require subvention by authors to defray the cost of paper, illustrations, reprints, on-line archiving, and so on. Consider the price for publishing with the nominatively-determinist American Astronomical Society: it includes paying US$27 for each 350 words and every figure or table plus US$30 for *errata* (http://iopscience.iop.org/0004-637X/page/Article%20charges). This is not always popular, but nor is it seen as vanity publishing.

Meanwhile, many disreputable science journals write to academics every day inviting them to offer their important work in return for a fee. This notorious practice led to the acceptance by the *International Journal of Advanced Computer Technology* of a paper comprised of the words 'Get Me Off Your Fucking Mailing List' repeated 863 times. The journal's reviewer graded the manuscript 'excellent' and its editor promised publication—in return for US$150. Such arrangements are far from atypical, and prey on the need of inexperienced researchers to appear in virtual print (Stromberg 2014; http://scholarlyoa.com/publishers/). Unscrupulous publishers also hijack journals by setting up titles that closely trope those of legitimately prestigious outlets (http://scholarlyoa.com/other-pages/hijacked-journals/). Since most predatory scholarly publishers are on-line only, this utopic development is scarred from the first by a dystopic other story. Once more, cybertarian fantasies of the internet are compromised by the desire for profit, thanks to '[o]verzealous open-access advocates' (Beall 2012).

Beyond obviously piratical conduct, we need to look out for what is happening with the major publishing players in the sciences, namely Elsevier (whose profit margin exceeds Apple's), Springer, Wiley, Taylor & Francis, and Sage (Smart 2015, Schmitt 2014). These firms have grown in size via mergers that swallow small publishers—Informa, which owns Taylor & Francis, made US$616 million from academic publishing in 2014 (Informa 2015). They benefit from the pressure that governments and university administrators put on young academics to publish at all costs. Against such tendencies, movements such as the American Society for Cell Biology's San Francisco Declaration on Research Assessment recruit scholars to resist the bizarre dedication to impact factors and other warlock scientism that are so beloved of bureaucrats and play into the hands of corporations waiting to benefit from the over-production of knowledge (American Society for Cell Biology 2013). We also see important resistance from the Scholarly Publishing and Academic Resources Coalition (http://www.sparc.arl.org/).

Whether it is to do with the political economy of mergers, public policy, library purchases, legitimate and predatory practice, or smart activism, science publishing will decide much of our future. For example, the University of Minnesota Press, a noted house for media and cultural studies, is partially underwritten by the Minnesota Multi-Phasic Personality Inventory, the test used pretty much around the world

to determine whether people are mad, and which psychologists at the University update when new income streams are required. Income from the Inventory helps fund the books it publishes.

Proposals are circulating for several different science-scholarship business models that might support cultural-studies style work, which in the US in particular has few external grants available to underwrite it. These ideas include allocating funds: to libraries, as before, to support the system overall by purchasing titles; to authors, to underwrite publishing by offering production subsidies; and to researchers, to underwrite reading through consumption subsidies. In addition, there are initiatives such as entirely open-access publishing funded by a capitation fee, calculated as per progressive taxation and paid by all research institutes, be they universities or free-standing entities (Smart 2014; Kennison and Norberg 2014).

Third Provocation: We must consider the relative merits of publishing electronically rather than on paper in terms of the environment—how green *is* this paper?

Given the massive expansion of scholarly publishing, what is the impact on the environment? Common sense suggests that on-line research and publishing will diminish the carbon footprint of print. Early comparisons of the environmental impact of printed newspapers versus electronic consumption support this view. Amongst British book buyers, recent research found that 80% believed electronic communications were less environmentally-destructive than paper ones. Sixty-five percent of publishing's carbon footprint comes from paper, and e-book readers require one-off transportation (obtaining the devices) and no pulping, bleaching, or printing. A Kindle, for example, is supposed to offset the carbon footprint of its production within a year, and over a lifetime, save the carbon needed to make twenty books (Maxwell and Miller 2012).

But there is no accepted measurement system for readers, publishers, scholars, policymakers, librarians, and salespeople to calculate the renewable virtues of paper versus the electrical vices of electronics and *vice versa*, while there are dozens of competing environmental-certification systems.

Because young trees are most efficient at absorbing carbon emissions, their regular replenishment, as undertaken by the paper industry, rather than reliance on elderly branches and roots, may be effective. And we know that the use of digital devices in the US generally relies on coal-powered electricity at some point in the supply chain. Web publishing does not encourage planting, so it does nothing to remove carbon from the atmosphere, unlike printing. And when comparisons are made, the time of day that electricity is used for reading, especially via mains power, must be factored into determining environmental impacts. Current research suggests that reading on line for half an hour equates to ninety minutes watching television or the printing of a newspaper (Maxwell and Miller 2013).

Conclusion

So where do my provocations leave us? Our publishing political economy is a strat-ified domain that is structured in dominance, and the utopic promises of new tech-nologies for publishing are outweighed by a dystopic reality.

As a consequence, we need to confront the following factors:

- the governmentalization and commodification of scholarly life
- the trends set by science; and
- the environmental impact of what we do

We must rethink the interaction of for-profit publishers and professional associa-tions, create independent not-for-profit alternatives[3], and address the interests of junior scholars—give them pragmatic advice at the same time as we urge them to transcend it. This is part of the idea of *gestión cultural*—tough to translate, it is a blend of cultural policy, administration, activism, and development.

If we don't do such things, the bright promise of open access, the proliferation of ideas, and democratized publishing will drag us down a very dismal alley, in fact a narrow *cul-de-sac* that leads to an array of goggle-eyed Anglo bureaucrats armed with energy-gorging measuring sticks, licking their unproductive lips just as their counterparts in corporate publishing do. Should we refuse a golden age of expres-sion and its explosion of outlets if it is tied so tightly to an increasing governmen-talization, Anglicization, and commodification of academic life?

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Notes

[1] I do so via the culturalstudies podcast http://culturalstudies.podbean.com/ and publication in the *bourgeois* and activist press. I also edit journals and books and write scholarly articles, chapters, and monographs. Many of these works are available freely and many are not. Apart from books, I put all of them that I can up on my personal website http://tobymiller.org/, with the implied copyright claim that this constitutes a body of work comprised of my writings. I have never selected an outlet or a topic to benefit my career.

[2] Now known in English as the Thomson Reuters Web of Science.

[3] Thank goodness for projects like *Culture Unbound*.

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