Open access: "Information wants to be free"?

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Earlier this year I was invited to [discuss](#) with Georgia Institute of Technology librarian [Fred Rascoe](#) my [eBook](#) "Open access: Could defeat be snatched from the jaws of victory?" for [Lost in the Stacks](#), the research library rock and roll show he hosts.[1]

Prior to the interview, Rascoe sent me a list of questions. As we did not have time to discuss them all during the interview, I decided to publish my answers on my blog. With the greater space available I also took the opportunity to expatiate at considerable length in doing so. As can be seen, this turned into another eBook!

Please note that what I say below is built on an interview. It is not intended to be any kind of prediction of the future; it is more an extended reflection after 20 years reporting on the OA movement, coupled with a heavy dose of speculation. Who knows, perhaps this will be the last thing I ever write on open access. Maybe this will prove my swan song.

I would also like to stress up front that in the critique of the OA movement that follows I don't claim that my knowledge, or predictions, are superior to anyone else's. This is just what I have concluded after many years observing the movement and reflects my current view on where I think we are today. It does also include a lot of factual data, as well as links and footnotes for those who like them. Importantly, while I do not consider myself to be an OA advocate, I admit that I was as naïve as anyone else about what the movement might be able to achieve.

Finally, while what I say might be slightly overweight in European developments, it may not matter if (as I believe is possible) events in Europe end up determining how open access develops globally. I say this because it seems possible that European OA initiatives will reconfigure the international scholarly communication system, and in ways that OA advocates will not be comfortable with. I would add that the main focus is on science publishing rather than HSS.

In light of the uncertainty that has been created by the pandemic I have added a [postscript](#) to the end of the document.

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[1] I don't generally give presentations or do live interviews, for two reasons. 1. I am pretty damned bad at live performances. 2. I have always self-presented as an independent journalist. Given the charged atmosphere in which OA is usually discussed it is easy to be co-opted by a stakeholder group when invited to attend events, which I feel could compromise my independence.
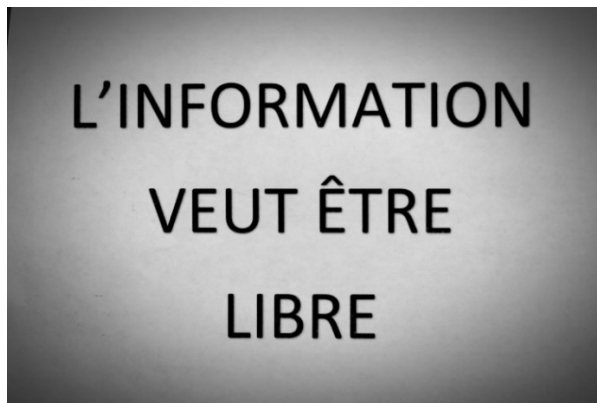
Below is a list of the main points I make in this document

- Internet mantras like *information wants to be free* misled OA advocates about what is possible in an online world. Amongst other things, these mantras led to the mistaken belief that publishing would be very much cheaper on the internet.

- BOAI was intended to achieve three things: to resolve the longstanding problems of *affordability*, *accessibility,* and *equity* that have long dogged scholarly communication.

- It now seems unlikely that the *affordability* and *equity* problems will be resolved, which will impact disproportionately negatively on those in the Global South. And if the geopolitical situation worsens, solving the *accessibility* problem may also prove difficult.

- OA advocates overestimated the wider research community's likely interest in open access. This led them to lobby governments and funders to insist that they force open access on their peers. This was a mistake as it opened the door to OA being captured by neoliberalism.

- The goals of the OA movement are out of sync with the current economic and political environment. This is not good news for scholarly communication, for library budgets or for OA.

- Populism and nationalism pose a significant threat to open access.

- The pandemic looks set to wreak havoc on budgets. This is likely to be bad news for OA.

- Rather than being a democratic force for good, the internet created power laws and network effects that saw neoliberalism morph into neofeudalism and paved the way for the surveillance capitalism and data extractivism that the web giants have pioneered. These negative phenomena look likely to become a feature of scholarly communication too.

- Today we see a mix of incompatible strategies being pursued by libraries, funders, and OA advocates – including unbundling, transformative agreements and the adoption of publishing platforms, as well as experiments with scholar-led and "collective action" initiatives. There appears to be no coherent overarching strategy. This could have perverse effects, which has in fact been an abiding feature of OA initiatives.

- OA advocates have unrealistic expectations about diamond open access and the possibility of the research community "taking back ownership" of scholarly communication.

- While publicly funded OA infrastructures would be highly desirable there currently seems to be little likelihood that governments will be willing to fund them, certainly at the necessary scale and with sufficient commitment.

- OA advocates have probably overplayed their claim that publishers are engaged in price gouging. Nevertheless, the industry consolidation we have seen has led to a publishing oligopoly that now dominates scientific publishing in a troubling way. And as these companies develop ever larger and more sophisticated platforms and portals, we can expect to see more worrying implications than high costs emerge. Unfortunately, governments and competition authorities currently seem either not to understand the dangers or are unwilling to act.

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Contents

Pre-internet world

Q: You describe yourself on your website as a journalist. How did you get interested in issues around scholarly publishing and open access?

A: First, a little background: In the 1980s, I was working as a High School English teacher in Leicestershire. It was not a career I was enjoying, so when in 1981 the BBC launched a branded microcomputer – and began a series of TV shows designed to educate the public about microcomputers – I purchased one of the micros and tuned into the shows. While I was inherently interested in the incipient microcomputer revolution, I also thought it might assist me make a career change.

Around the same time, British Telecommunications (BT) launched an online Viewdata service called Prestel. Envisaged as a business service, Prestel initially catered mainly to the financial services and travel industries. However, the growing interest in home computers raised the possibility that Prestel might be able to reach a wider audience. Seeing an opportunity here, in 1982 a company called Telemap set up as a Prestel information provider and launched a service called Micronet 800.

Prestel and Micronet were of particular interest to me as I found the notion of being able to connect a home computer to remote information services (at that time dialling up over the phone line using a modem) compelling. So, I took out a Micronet subscription and became an "online user". Others clearly also saw the appeal and Micronet was soon recruiting large numbers of home computer users.[2]

To provide some further context, while this was a pre-internet world there had been a number of proprietary online services ("online hosts" as they were then called) since the early 1970s. These were created to provide dialup access to expensive databases containing value-added financial, business, legal, patent and trademark information. I am talking about hosts like the US-based Dialog and LexisNexis, the French Questel-Orbit, the German GENIOS and the UK's FT Profile.

Keen to get into this market as well, in 1982 BT launched a service called Telecom Gold. This offered gateway access to business information databases like Kompass and Jordans,

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[2] In addition to the BBC Micro there were by now a number of other popular microcomputers available in the UK, including the Z81 and the Commodore 64.

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legal information from Justis, and online news from the *Wall Street Journal* and *Financial Times*. It also provided professional email and telex services and encouraged businesses and communities of interest to set up closed user groups (CUGs) on the system in order to communicate with one another and share information online in a private setting. The UK's Trading Standards Offices, for instance, had a CUG on Telecom Gold.

New chapter

What was new and interesting about Micronet was that it succeeded in creating a consumer market for online information in the UK. It helped that, in contrast to the dull scrolling ASCII interfaces of online services like Dialog and Telecom Gold, Prestel offered a graphical interface. Admittedly the graphics were crude and limited in scope, but they did allow designers to present information in a creative and pleasing visual manner.

And while Micronet was initially developed for home computer users its ambitions grew with its expanding user base. In addition to news and information about microcomputers, for instance, Micronet began to offer general news services, book reviews and online lifestyle magazines.

Importantly, it also introduced a number of interactive services, including email, chatlines and (often off-the-wall) interviews where users could post questions and follow the interview in real-time. Two of the more notable interviews I recall were with the singer Fergal Sharkey and the brothel-keeper "Madam Cyn", who in 1978 had been imprisoned for 18 months for running "the biggest disorderly house" in British history.

There was another online service for micro users in the UK called MicroLink but, since it had started as a CUG on Telecom Gold, it did not have the visual appeal of Micronet. After it relocated to a cheaper host, MicroLink also lost its connection to the Telecom Gold email service (despite promises to the contrary) which led to its closure. CompuServe UK, meanwhile, did not launch until 1995 and was primarily marketed as an ecommerce platform, providing online space to major UK retail and catalogue companies. This emphasis was evident from the start, with the launch of the service marked by the online purchase of a (print) book from UK retailer WH Smith.

In short, Micronet was innovative and different and, as a result, quickly became the most successful information provider on Prestel.

Another of Micronet's distinctive features was that it encouraged users to contribute to the service, which created a real sense of community. As I did not want to be merely a passive user I started submitting software reviews, stock market commentary, and other such scribblings to Micronet's editorial team – including an account of the year I had spent at Moscow State University when Leonid Brezhnev was leader of the Soviet Union, during which time I married a Russian artist.

My efforts were rewarded when, in 1985, I was invited to join Telemap as a full-time employee and moved south to work in Micronet's office at 8 Herbal Hill (Horrible Hill as it was called) in London's Farringdon district. There I was tasked with setting up a business information service called Bizznet (second screenshot here). In addition to business information this included interactive services that answered users' questions about legal, tax

and medical matters (see here). It was at that point that my teaching career ended, and a new chapter began.

Micronet's success[3] did not escape the notice of BT, and in 1989 the telecoms company acquired Telemap and relocated Micronet's staff from central London to a BT office in Hemel Hempstead.

The plan was to leverage the combined strengths of Prestel and Micronet to replicate the success of the French videotext service Minitel.[4] BT's strategy was a good one and I think it could have worked. But the best-laid plans of mice and men often go awry. Two things served to sabotage BT's plans.

First, the kind of issues that now bedevil the web soon began to surface on Prestel. When in 1990 a series of articles were published in the UK press detailing instances of abuse and predatory behaviour on the Prestel chatlines, for instance, the newly privatised (and thus sensitive to criticism) BT was forced to acknowledge that it could not operate them "free from any abuse" and promptly closed all its chatlines down.

Second, in a hurry to monetise its new acquisition as quickly as possible, BT took the reckless decision to double Micronet's annual membership fee and increase online usage charges. Customers responded quickly and dramatically – practically overnight a quarter of Micronet's users closed their accounts, and as the annual renewal bills began to go out the cancellations escalated. Unable to stem the flood, BT pulled the plug on the entire Micronet service, announcing that it was going to refocus Prestel on the business market. Without Micronet, however, Prestel struggled, and in 1994 BT sold off what was left of the service, having never acquired more than 90,000 users.

Of course, like other pre-internet services Prestel would soon have had to face the onslaught of the web, but the experience and expertise that Micronet had acquired in developing innovative online services could have been leveraged on the internet and I believe the company could have gone on to do interesting things in the new online world.

Anyway, the closure of Micronet led to my being reassigned to a role marketing the value-added business databases on Telecom Gold. As this was not the change of career I had envisaged, I moved on again, becoming a freelance journalist – writing, for instance, for the technology page of the *Financial Times* and for newspapers like the *Wall Street Journal Europe*. I also became freelance editor of *Information World Review* (*IWR*) a monthly print publication covering the "online industry". This was widely read by academic and corporate librarians.

Open access

That preamble over, let me address your question: How did I become interested in issues around scholarly publishing and open access? At *IWR* I spent a lot of time writing about the online hosts I mentioned. As these services were very complex and difficult to search (and

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[3] This article, published the year before I began working for Micronet, gives some further background to the service.

[4] In 1986 Minitel had 1.4 million terminals connected to it, and by 1999 over 40% of the French population was using the service

incurred costly time-based charges) using them required specialist skills in, for instance, Boolean searching, the use of controlled vocabularies and the intricacies of patent searching. It was generally librarians (or "information professionals") who acquired these skills and did the searching on behalf of "end users". Librarians were usually also the people responsible for paying the online usage charges.

I also began to find myself reporting on the migration of scholarly journals to the internet. In 1996, for instance, I did a news story for *IWR* about the launch of ScienceDirect, when for the first time Elsevier made the full text of 1,200 of its journals accessible via a web browser.[5] The year before (1995) Stanford University Libraries had founded HighWire, a journal hosting platform that allowed journals to make their content available online.[6] The first to sign up was the *Journal of Biological Chemistry (JBC)*.[7] At that time publishers like Springer-Verlag were also starting to experiment with incorporating multimedia into online journals.

Librarians were watching these developments with particular interest and in writing for *IWR* I spent a lot of time talking to them and listening to their concerns. This was the time, for instance, when librarians were starting to become restive about costs, both the costs of online databases and the costs of journal subscriptions.

It was concern about the latter that led to the creation in 1998 of the Scholarly Publishing and Academic Resources Coalition (SPARC) – an alliance of academic and research libraries. SPARC's initial plan was to partner with learned societies to create new low-cost journals able to compete with the increasingly expensive journals of commercial publishers. This had mixed results – e.g. SPARC's partnership with the American Chemical Society (ACS) to found the journal *Organic Letters* attracted some criticism at the time, not least (counterintuitively) for its high costs.[8] It also became clear that this was not a solution that could scale. In addition, SPARC co-founded the BioOne scholarly publishing platform as an alternative to commercial publishers.

SPARC's focus changed with the Budapest Open Access Initiative – when, instead of trying to create new alternative non-commercial journals and services, librarians began to focus on calling for all research papers to be made freely available on the internet.

BOAI emerged from a 2001 meeting held in Budapest and organised by philanthropist George Soros' Open Society Institute (OSI).[9] That meeting is viewed as the birth of the open

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[5] I reported on Elsevier a lot over the years. In 2013, however, the company objected to what I had written about its foot-dragging response to open access and decided that henceforth none of its employees could do interviews with me. I learned how controversial a topic open access can be!

[6] In 2014 HighWire became a private company, moved out of Stanford, and private equity firm Accel-KKR took a majority stake. On 1st July this year HighWire was acquired by MPS Limited. Today HighWire hosts 2 million articles.

[7] Earlier this year, the American Society for Biochemistry and Molecular Biology (ASBMB) announced that the society would cease independent publication of *Journal of Biological Chemistry* (*JBC*) and would be moving the journal, along with other ASBMB titles, to Elsevier in order to better manage a shift to open access. In the context of what I will say below about legacy publishers increasing their power in an OA environment I think this is significant.

[8] As then Princeton librarian David Goodman put it in 1999, "The subnet policy is bad in general, and the relative prices for electronic access outrageous, but my immediate concern is the SPARC sponsorship. SPARC is supposed to, I thought, both reduce costs and promote good practices. I consider it inappropriate for its sponsorship to be given to a journal published in this manner."

[9] Later renamed the Open Society Foundations.

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access movement and the 16 people who attended (including the then SPARC director Rick Johnson) subsequently published the seminal [BOAI Declaration](#). BOAI proposed two forms of open access (known today as [green](#) and [gold](#) OA[10]), and to kickstart the movement, OSI agreed to provide a grant of $3 million. I [reported](#) on this in 2002 for the US equivalent of *IWR, Information Today*.

In short, in reporting for publications like *IWR* and *Information Today* I was alerted (amongst other things) to the growing *affordability* problem that confronted scholarly communication and the ways in which librarians (and some researchers) were starting to respond to it. I had also been well tutored in the issues of open access the year before BOAI, when I [interviewed](#) the garrulous and ebullient OA advocate [Stevan Harnad](#) for the *Financial Times*.[11]

It helped that I found these issues inherently interesting. What I found particularly interesting was the way the OA movement had tapped into the internet mantra "*[information wants to be free](#)*" – a phrase coined at a 1984 hackers conference by [Stewart Brand](#), an early online aficionado and founder of the iconic virtual community [The Well](#).

Used to writing news stories about proprietary online information services that [charged hundreds of dollars per connect hour](#), plus display, print and image fees, I found the notion that the internet would allow information that normally costs a lot of money to be made freely available intriguing. Nor did it seem so far-fetched in some cases – around the time of BOAI the major patent offices were starting to [make patent information freely available on the internet](#), leading critics to complain that this would destroy the information industry.

But it was in the context of scholarly journals that the idea seemed most plausible. As OA advocates repeatedly point out, most research published in scholarly journals has been funded by taxpayers, and the papers produced as part of the research process are freely given by the authors to scholarly publishers. Other researchers willingly (and without payment) review these papers and publishers then bundle them together and sell them back to the research community in the shape of scholarly journals – a model OA advocates maintain is inherently predatory.

Initially, the main focus of the open access movement was on exhorting researchers to share their papers with one another by posting copies of them online (green OA) – on their personal web sites, on preprint servers like [arXiv](#) and later in institutional repositories.[12] Since green OA offered an alternative (and free) way for people to access research papers, it was argued, publishers would face sufficient competitive pressure that they would have to downsize their operations to the management of the peer review process alone, and their prices would fall significantly as a result.[13] In the event, researchers proved surprisingly reluctant to self-archive their papers and publishers discouraged it by imposing long embargoes. As a result, green OA began to look an unlikely solution to the problems BOAI aimed to solve.

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[10] Green OA is where authors or librarians provide free access to scholarly works by posting copies of them in repositories (i.e. repository-based OA); gold OA is where publishers make research papers freely available on their web site at the time of publication (i.e. journal-based OA). The latter does [not imply pay-to-publish](#), but many people assume it does, and indeed pay-to-publish is fast becoming the norm. Since then, we have also seen terms like [diamond/platinum](#) OA, [bronze OA](#) and [black OA](#) appear.

[11] Harnad retired [from the field](#) of OA advocacy in 2016, disappointed at the way open access was developing.

[12] This proposal was first made by Stevan Harnad's 1994 [Subversive Proposal](#).

[13] See Harnad's 2007 [article](#) for details of this.

BOAI did, however, also call on publishers to themselves start making the papers they published open access (gold OA). It was assumed that in order to do this, they would develop new business models, and new OA publishers would emerge as well. Importantly, since it was assumed that the costs of publishing would fall dramatically on the web, these new models were expected to solve the *affordability* problem. In the event, the model that has come to dominate is pay-to-publish gold OA, with authors or their funders required to pay article-processing charges (APCs). This has simply moved the cost from the reader side to the author (or her funder) side and ported legacy publishers' prices into the OA environment. As a result, gold OA has also begun to look an unlikely solution to the problems BOAI aimed to solve.

True, BOAI did not claim there were no costs. Rather it said, "experiments show that the overall costs of providing open access to this literature are far lower than the costs of traditional forms of dissemination."

Either way, as publishers began to develop open-access journals the "*information wants to be free*" mantra began to look a little jaded. It became clear, for instance, that in addition to *managing* the peer review process, publishers are also needed to edit, produce, publish and archive the scholarly papers that are submitted to them.[14] And it turns out that this is not a costless process, even in an online environment.[15]

Today some argue that online publishing is actually *more* costly than print (and that there is an inverse economy of scale, as complexity increases and coordination becomes more complicated).

This has left the OA movement with several abiding and seemingly intractable challenges: how can the research community establish what a fair price for publishing a research paper and/or journal is? How can it make sure it gets value for money from publishers? How are these costs to be paid, and by whom?

These remain contested issues today, not least because no scholarly publisher has convincingly demonstrated what the true costs of publishing a paper are. It may even be that it is not practically possible to do so. Nor is it clear how publishers can be compelled to provide this information.[16]

In short, despite 20+ years of discussion and debate, we still don't know whether publishing research online is cheaper than in the print world and, if so, by how much. That in turn means

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[14] In 2018 Kent Anderson listed 102 things that publishers do. While some may quibble with some of them, it goes give a good sense of publishers do.

[15] For a sense of how monograph publishers view the necessary things they do see this from Richard Fisher.

[16] Last year a group of European funders called cOAlition S commissioned *Information Power* to produce a framework for price transparency. Most oddly, however, earlier this year we were told that this would not be a "cost accounting exercise" but simply a way of validating journals by capturing the views of customers – in the manner of Trip Advisor. What this had to do with price transparency was somewhat of a mystery. Ironically, a service like this – the Quality Open Access Market (QOAM) – has existed since 2013. Also odd is that QOAM's current Chair (Johan Rooryck) is the Open Access Champion for cOAlition S. Either way QOAM has had to give up on some of its objectives True, when the final price transparency report was published the scope appeared to have widened a little, but we must doubt that anything meaningful will emerge from the initiative. More on this later. (**P. 50**). It is hard not to conclude that, for all the lip service funders pay to the need to contain costs, a lot of money is being spent to little purpose in the open access space.

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that we do not know what a fair and reasonable price for publishers to charge for their services is. I will say more about this later.

Three tests

The question of pricing is particularly important because librarians (who were, and remain, the most active and committed OA advocates) joined the movement primarily in the belief that it would reduce the costs of scholarly publishing and so ease the pressure on their budgets.

More worrying, perhaps, is that there remains no consensus on how best to achieve open access – despite all the years of arguing over it. I believe this is partly because discussions about OA tend to lack sufficient focus on the *purpose* of open access. Rather, we tend to see general assertions made along the lines of how, in an online world, research can and should ("*wants to*") be free, that open access is (or ought to be) cheaper, and that open access is ontologically an unmitigated good.[17]

It would have helped if the interminable discussions had always been anchored to a clear sense of why open access is necessary and the specific advantages it can bring – beyond the previously mentioned broad assertions and (generally unsubstantiated) claims that paywalls cost lives and that open access will save them and "speed up science".[18] [19] (Which, as the pandemic has shown, comes with its own set of problems).

If there had always been a clear focus on the goals of open access when new OA initiatives were proposed and discussed, and had these proposals been subjected to critical examination

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[17] Moreover, anyone who raises doubts about open access, or suggests that the subscription system has advantages, can expect to be met with a barrage of criticism on social media deploying the full panoply of virtue signalling techniques. As Philip Mirowski put it in 2014, "These days, being against 'openness' is akin to being against motherhood or cute Internet kittens, almost by definition." Alternatively, they may simply be ignored.

[18] If you consider the practical case here you might want to conclude that what speeds up science is not so much open access as open data.

[19] OA advocates argue that OA will allow the public, unfunded researchers, and researchers in the Global South to benefit. As I shall suggest, this is only partially true. Moreover, OA seems likely to make the situation worse for these three groups. To strengthen their case, and for PR advocacy purposes, OA advocates have been keen to adopt anyone outside the research community who expresses an interest in OA. Often, however, it transpires that these OA adoptees are not entirely reliable witnesses. In 2013, for instance, the OA movement adopted Jack Andraka, a citizen scientist and self-professed OA advocate who as a 15-year old claimed to have developed a novel cancer-detection method by searching for articles on the internet. Initially widely lauded by the OA movement he was later criticised for not publishing his discovery openly so that others could build on it (also here). Instead, Andraka sought to obtain a patent. This failed when the patent office threw it out for lack of novelty. In another case, in 2015, the chief medical officer of Liberia's Ministry of Health complained that a paper published in 1982 that had predicted Liberia was susceptible to an Ebola outbreak had been published behind a paywall and so was not available to Liberian doctors and health experts. This meant, he said, that they did not know about the risk of an outbreak, and so were not able to protect the country when it suffered an Ebola outbreak in 2014. Again, it turned out that the story was more complex than presented. It was pointed out, for instance, that the paper in question *was* freely available via the Research4Life program. What this last incident demonstrated was not so much that open access is essential but that there are greater hurdles to accessing research in the Global South than paywalls – not least a knowledge of available resources, online searching expertise and bandwidth.

before being introduced (including considering whether they might have unintended consequences), I believe open access would be in a different place today.[20]

Of course, this would have required having a clear set of goals. But in addition to proposing two types of open access, the 2001 Budapest Declaration made the far more important contribution of setting down the goals of the movement. True, these could have been better signalled as distinct goals, but BOAI justified its call for open access on the grounds that it would achieve them.[21] Importantly, while there has been constant wrangling over the details and *means* of achieving open access, I know of no OA advocate who would disagree with these goals.

What I am saying is that while everyone in the OA movement agrees with the *ends* of open access outlined by BOAI, these *ends* have too often been lost sight of in heated discussions about the *means*.

What are the BOAI goals? A reading of the BOAI declaration makes it clear that open access was expected to solve *three long-standing problems* of scholarly communication. And this was now possible, it was asserted, because the internet allows the free and frictionless exchange of information on a global basis.[22]

I hope in what follows it will be clear why I believe it would have helped if more attention had been paid to these *ends*.

What are the three problems BOAI promised to resolve? They can be characterised as the problems of 1) *affordability* (the OA movement has consistently argued that the subscription system is far too expensive, and ultimately financially unsustainable; BOAI asserted that OA would be much cheaper[23]); 2) *accessibility* (subscription paywalls often prevent researchers from accessing the research they need; BOAI asserted that OA would free scholarly papers from these paywalls and so enable researchers to access everything they wanted[24]) and 3) *equity* (researchers in less affluent countries and institutions who cannot afford many journal subscriptions are disproportionally impacted by the first two problems. BOAI asserted that

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[20] Speaking to me about the 2012 Finch Report (which led to a pay-to-publish gold OA policy being introduced in the UK), UCL Vice-Provost David Price said, "Finch is certainly a cure to the problem of access, but is it not a cure which is actually worse than the disease?"

[21] It is worth noting that on the 10-year anniversary of BOAI the original Declaration was reaffirmed. In addition, it was stated, "we reaffirm the *ends* and *means* of the original BOAI." [My italics]. The word "*ends*" does not appear once in the original declaration, but the 10-year reaffirmation makes a point of stressing the need to address them, including the problem of *equity*. In doing so it cited from the original declaration the need to "*accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge*."

[22] Of course, a reliable internet connection is also needed. But that this could be an issue has never been fully appreciated by the leading advocates for open access, who were initially invariably based in the Global North. Interestingly, the pandemic has drawn attention to the fact that a digital divide still exists in the US, where 18 million Americans don't have access to high-speed internet access.

[23] BOAI said, "*Experiments show that the overall costs of providing open access to this literature are far lower than the costs of traditional forms of dissemination.*"

[24] BOAI said the internet would allow, "*the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds.*"

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OA would level the playing field and create a fairer and more equitable scholarly communication system.[25])

My point is that before any new OA initiative, policy or mandate is introduced those proposing it should be duty bound to demonstrate a high likelihood that it will resolve *all* three problems outlined by BOAI, and to do due diligence on the dangers of it creating new problems or having perverse effects. That is, before any OA policy or initiative is introduced it should be expected to pass what I call the three tests of open access.[26]

To be clear, I am not saying that BOAI's three goals were and are never discussed. In some ways, one could argue that they are over discussed. However, they are rarely *adequately* discussed, and too often proposed by advocates in the Global North with little or no understanding of the needs of, and likely impact on, those in the Global South. If one considers that one of the promises of BOAI was that it would provide greater *equity* this last failure represents a serious shortcoming of the movement. Above all, however, the three goals are never considered in a holistic manner, and discussions about open access usually consist of a cacophony of discordant voices and conflicting views, with consensus rarely if ever reached.

More specifically, most discussions about open access get bogged down in (often angry) disagreement over things like green versus gold OA, gratis vs. libre OA,[27] and the necessity and nature of open access mandates, often regardless of whether the OA policy or mandate being proposed is likely to address the problems of *equity* and *affordability* or whether it might have unintended consequences.

As a result, time and time again OA policies have overreached themselves, failed to have the desired effect and/or had undesirable side effects. And while they are later usually adjusted on the hoof, this often only creates new problems while still failing to achieve the objectives of the policy. As such, they sometimes make the situation worse rather than better. I think the European initiative Plan S, announced by a group of funders called cOAlition S in 2018, is a case in point.[28] More on this later.

To repeat: in most discussions about open access the desired *ends* often get lost sight of, or obscured, in the smoke of disagreement over the *means*.

The history of open access tells us that if you don't keep your eye on the ball you will miss the net! Or to put it another way, if you lose sight of the end game, you are in danger of losing the game itself.

It does not help that when debating open access, the different stakeholders tend to make exaggerated and/or inaccurate claims to support their argument/interests. For their part,

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[25] BOAI said open access would, *"accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge".*

[26] In other words, to solve all three problems: *affordability*, *accessibility*, and *equity*.

[27] One of the problems with open and free movements has been the ambiguity of the word "free" in English. It can mean "free as in free beer" (gratis) or free as in "with free or no restrictions" (libre). It was only in 2008 that the OA movement tried to clarify this.

[28] As I shall discuss later, Plan S began as an ambitious but unrealistic initiative. The funders who launched it (cOAlition S) have therefore had to make one concession after another, even before it has gone live.

publishers regularly talk up their contribution to the process of scholarly communication – implying, for instance, that it is *they* who peer review scholarly papers rather than researchers, and even sometimes giving the impression that papers are essentially the product of publishers, and that researchers contribute little or nothing![29]

On the other side of the debate, open access advocates routinely exaggerate the problems of the traditional subscription model and the benefits of open access. And they consistently underestimate (and often seem to want to airbrush away) the inevitable costs of scholarly publishing. Above all, they assert (or give the impression) that the natural state for all research information and data is to be freely available to anyone. In making their case for this they often cite[30] Brand's phrase "*information wants to be free*", or at least talk as if Brand's assertion is a truism in an online world.

Moreover, when Brand is cited his words are rarely if ever contextualised. According to Wikipedia the full quote reads: "*On the one hand information wants to be expensive, because it's so valuable. The right information in the right place just changes your life. On the other hand, information wants to be free, because the cost of getting it out is getting lower and lower all the time. So you have these two fighting against each other*".[31]

In fact, even Wikipedia does not cite the quote fully. What Brand actually said was, "On the one hand information *sort of* wants to be expensive … on the other hand information *almost* wants to be free because the cost of getting it out *in many respects* is getting lower and lower all the time…" [my italics]

But what is most striking is that open advocates (of all stripes) ignore (or simply do not know) the fact that when Brand first uttered these words (during a conversation with Apple co-founder Steve Wozniak) he was not talking about the costs of making information available online but responding to Wozniak's complaint that companies cling jealously to all the intellectual property they generate even when they have no intention of using it. In other words, Wozniak and Brand were talking in the context of sharing ideas not content. As far as

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[29] Of course, once an author has signed a copyright agreement with a publisher the paper does (in practical effect) become the property of the publisher. But to imply that all or most of the intellectual input came from publishers is downright disingenuous.

[30] See also the strapline here. And the deliberate use of the phrase in this column by prominent advocate for open access James Boyle.

[31] One problem with Brand's mantra is that the word "free" in English is ambiguous. It can mean free as in no charge, or free as in little or no restriction. Richard Stallman expressed it this way, "Think free as in free speech, not free beer." In 2008, Peter Suber used this distinction to talk of two types of open access: gratis and libre. "I've decided to use the term 'gratis OA' for the removal of price barriers alone and 'libre OA' for the removal of price and at least some permission barriers." I think Brand was talking exclusively of the first type (gratis). One consequence is that OA advocates have often assumed that free means at no cost to the reader or anyone else as the there are no real costs to distributing information over the internet and so no costs now in publishing research.

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I can establish the distribution of information online was not at issue in that initial exchange.[32] [33]

All of which is to say that by 2004 I had become sufficiently intrigued by the whole open/shut/free/charged debate that I started my blog *Open & Shut?* Implicit in all I have written on my blog since then, and in the interviews I have conducted, has been a desire to explore the many complex and contested issues surrounding open access, primarily (but not exclusively) in the context of scholarly publishing.

Looking back

Looking back at my experiences with pre-internet online systems today and thinking about what I have learned from writing about the OA movement, the following thoughts occur to me.

First, as the internet becomes increasingly bogged down in a swamp of spammers, scammers scallywags, and sham newsmongers, and as awareness grows that something needs to be done about it, I have to conclude that these issues were pre-figured in the problems BT faced in the 1980s. But where BT was able to resolve the situation by simply closing down its chatlines (and subsequently the whole Micronet service) as a straightforward business decision, the internet is now so embedded in our lives and in our social and business processes that resolving these kinds of problems on the web is much more complex – although it is perfectly possible that at some point governments will take equally drastic decisions in relation to the internet as BT did with Micronet.

Certainly, we seem to be moving in that direction: Most if not all governments are now intervening in the online world. One way they are doing this is by introducing new online harms[34] and cybercrime laws and online copyright legislation like the proposed US Online Content Policy Modernization Act (OCPMA) (OCPMA) and the EU's Directive on Copyright in the Digital Single Market (DSM). Unfortunately, these new laws often have unintended consequences. Designed to protect citizens from the bad actors that now prey on anyone and everyone online, for instance, the online harms legislation will likely have collateral damage – not just by interfering with the frictionless movement of information[35] that is viewed as inherent to the internet, but by censoring free speech and undermining the democratic values considered essential for a healthy society (certainly in many countries).

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[32] That said, Brand did later adapt his statement to broaden its meaning. For instance, three years later, in *The Media Lab: Inventing the Future at MIT*, he wrote, "Information Wants To Be Free. Information also wants to be expensive. Information wants to be free because it has become so cheap to distribute, copy, and recombine – too cheap to meter. It wants to be expensive because it can be immeasurably valuable to the recipient. That tension will not go away. It leads to endless wrenching debate about price, copyright, 'intellectual property', the moral rightness of casual distribution, because each round of new devices makes the tension worse, not better." The point is that Brand's meme emerged from a conversation about companies not sharing their ideas, not about distributing information online. It is likely that Brand expanded his meaning in response to the way others had begun using it, in the kind of dynamic process by which the meaning of words and expressions changes over time.

[33] We should also note the off-stage comment in that exchange (by Wozniak?) that information should be free, "but not your time".

[34] The UK law is now not now expected to come into effect until 2023 or 2024. See also. An Australian disinformation law is also in the works.

[35] This is the kind of discussion we are now seeing with regard to the mooted UK Online Harms legislation.

The same issues arise with OCPMA and DSM. There are also concerns that the EU's proposed Digital Services Act (DSA) could impact negatively on the research community.

The truth is that legal solutions are blunt instruments. As well as stemming fraudulent activity, the circulation of illegal content, and disinformation, these new laws could end up suppressing and blocking legitimate material, including content published in scholarly journals.[36] And since the free flow of scientific information is fundamental to the global research endeavour, this might seem to be bad news for scholarly communication and for open access.

Moreover, as much of this undesirable content is believed to originate in other countries[37] if legislative attempts to remedy the situation come to be viewed as inadequate or failing, governments are likely to start taking more extreme measures. National and/or regional digital borders are likely to be erected, for instance, causing the internet to start to fracture and break up. This is not just speculation: Already we see countries like Russia (which is currently focused on creating its own "sovereign internet), China, Iran and North Korea starting to detach themselves from the global network.

This suggests to me that the internet could face the kind of disruption that confronted MicroLink when its email connection to Telecom Gold was cut, a development that led to its demise. I will return to this topic later.

Second, as I have said, producing and distributing information is never a costless process, even in an online world, and even where it is publicly funded information that is being distributed. This means that online services – however useful and innovative they may be – inevitably require a long-term sustainable and sufficient source of funding.

Anyone who gives this last point a moment's thought will surely agree that it is obvious. The problem is that repeated mouthing of internet memes like *"information wants to be free"* (and simplistic arguments about *rival vs nonrival goods*)[38] tends to feed fantasies that everything on the internet can and should be free of charge.

One consequence of this is that OA advocates are inclined to view those who illegally take and distribute scholarly works – e.g. as Alexandra Elbakyan does with Sci-Hub – as Robin Hoods rather than the law breakers they really are. We also see them applauding the actions of activists like Aaron Swartz when they illegally download entire databases[39] and publish

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[36] There are also fears that the new laws will encourage state censorship.

[37] *The Economist* reports, for instance, that Cabells lists only a few reliable Nigerian journals, "but 1,100 predatory ones. India's figures are 300 and 4,400. Another 5,800 blacklisted titles claim to be based in Europe or North America but do not provide evidence, such as a valid address." This is a difficult and controversial topic but predatory publishing is often debated in terms both of the country in which the predators are based and the countries where researchers are most at risk of their activity, primarily by being targeted with spam email.

[38] Advocates for openness frequently make a distinction between rival and nonrival goods. In doing so, they often quote Thomas Jefferson's words on the nonrival nature of ideas. While this distinction certainly has some value (not least in the context of information whose production has been funded by the taxpayer) it tends to overlook the costs necessarily incurred in the management and distribution of scholarly information. (A fuller version of Jefferson's thoughts is available here).

[39] That said, Swartz's story is a tragic one and the authorities clearly overreacted. The Wikipedia page about him says, "In 2011, Swartz was arrested by Massachusetts Institute of Technology (MIT) police on state breaking-and-entering charges, after connecting a computer to the MIT network in an unmarked and unlocked

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controversial documents like the *Guerilla Open Access Manifesto* (2008). The latter, *inter alia*, says: "We need to buy secret databases and put them on the Web. We need to download scientific journals and upload them to file sharing networks." We have even seen those who work for funders linking to illegal copies of paywalled papers hosted on Sci-Hub.

To justify their support for such actions OA advocates will sometimes argue that sharing research papers illegally is justifiable civil disobedience. As one researcher put it, "when human rights ('Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.') are at stake, civil disobedience of the kind Sci-Hub is a great example of, becomes a societal imperative."

While there can be very good reasons for engaging in civil disobedience, I do not see such justification when it comes to the mass release of paywalled research papers or routinely linking to Sci-Hub.[40]

We also see some – including librarians (who normally self-present as the guardians of copyright) – directly linking Sci-Hub and the actions of Swartz with the "*information wants to be free*" mantra[41] and in a way that encourages the civil disobedience train of thought. I suspect when doing so they fail to think through the logic of what they are saying. One librarian (and open access advocate) has called her blog "*information wants to be free.*"

What encourages people to take an unrealistic view about the costs of online information is that the internet is awash with free information services whose funding is to a great extent invisibilised. With so much free content and so many free services available internet users tend to be oblivious to how these services are financed, and whether they can persist over time as free services. Moreover, some of the implications of using these services are only just now beginning to be fully understood.

We all realise that free online services make money from advertising, for instance, but many of us do not appreciate (or simply overlook) the fact that in order to sell those ads, online services track everything we do when we use their platforms. We have also seen the companies who run the services seeking to monetise and share personal information without users' knowledge,[42] or without being transparent about the extent of the tracking they do, how they monetise the resulting data, and the potential consequences that this has for users.[43] Only recently has the degree to which free services invisibly track and profit from our online

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closet, and setting it to download academic journal articles systematically from JSTOR using a guest user account issued to him by MIT. Federal prosecutors later charged him with two counts of wire fraud and eleven violations of the Computer Fraud and Abuse Act, carrying a cumulative maximum penalty of $1 million in fines, 35 years in prison, asset forfeiture, restitution, and supervised release. Swartz declined a plea bargain under which he would have served six months in federal prison. Two days after the prosecution rejected a counter-offer by Swartz, he was found dead in his Brooklyn apartment, where he had hanged himself. In 2013, Swartz was inducted posthumously into the Internet Hall of Fame."

[40] Some OA advocates have expressed disapproval of Sci-Hub.

[41] And while they usually make it clear that they do not endorse his actions they show themselves to be ambiguous about the matter, and I would say the OA movement has generally sought to turn Swartz into a victim.

[42] E.g. with Facebook's Beacon system (subsequently closed following litigation).

[43] As the saying goes, "if you're not paying for the product, you are the product."

activity, and compromise our privacy while psychologically manipulating us, been fully explored.[44] [45]

While we might assume this to be only relevant to consumer services, as companies like Google, Microsoft and Facebook take an increasing interest in providing services (and funding) for the research community, similar activities and models are likely to emerge in the world of scholarly communication. In fact, services like Academia.edu and ResearchGate have been tracking researchers for some years. Unsurprisingly, they have been criticised for this, and for having values "in sharp contrast with the idea and the ethics of Open Access." Yet they are very widely used by researchers, who may not understand the implications or simply don't care. I shall discuss this more later.

As the extent of the tracking of users and the monetisation of personal data has become evident, so governments have begun to intervene here too – by, for instance, introducing new data protection laws like the EU's General Data Protection Regulation (GDPR),[46] the California Consumer Privacy Act, South Africa's Protection of Personal Information Act and India's Data Protection Bill.

Like the "online harms" and fake news legislation, the new data protection laws can also interfere with the free flow of information.[47] Many news sites in the US, for instance, have (over two years after the law was introduced) yet to comply with the GDPR, and some clearly do not intend to. As a result, many US news sites that were once freely available to all are no longer accessible from Europe – even on a subscription basis.[48] The brave new online world that promised the global frictionless exchange of information could turn out to be a short-lived phenomenon.

With such legislation proliferating – and courts beginning to order online services to curb their collection of user data – at some point free online services can expect to face loss of revenue. As a result, they may conclude that they have no choice but to start charging users. Google is already driving users mad with its constant invitations to subscribe to the YouTube premium service[49] and next year will impose a storage limit of 15 GB for Google Photos, with an option for paying for more. There has also been speculation that Twitter plans to launch a subscription service (see also). Faced with growing antitrust pressure (see also), and demands that they change the way they do things, some web companies will at some point

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[44] As one of those interviewed in the Netflix film "The Social Dilemma" suggested, online users are manipulated as if lab rats.

[45] For a thorough discussion of the issues I recommend reading Shoshana Zuboff's book, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*.

[46] It seems that the GDPR may in fact have failed to address the issue of privacy, certainly in terms of obtaining consent from users – see this article. The UK Competition and Markets Authority has also complained the services like Google and Facebook are using the GDPR to their own advantage.

[47] Note also what Sarah Kreps has said with regard to the GDPR, "The European Union has drawn a virtual boundary around its member states to keep personal data from leaving the EU." Is that not evidence that the internet is fracturing?

[48] At the time of writing (over a year after the GDPR came into effect) over 1,000 such sites are inaccessible in Europe, including the *Chicago Tribune*, the eighth-largest newspaper in the United States by circulation. Even some pages of the *Los Angeles Times* (the third-largest circulation among United States newspapers) are inaccessible to European users.

[49] It is also closing its free Google Music app and asking users to switch to YouTube Music. This not only pesters users to sign up to a subscription service, but users have to subscribe if they want the level of functionality that was available the free Google Music app.

have to start charging users for the content and services they provide, if only by introducing freemium and premium services.

Will this see a gradual shift back to a world of subscriptions? Perhaps. The decline in advertising (see also here) as a result of the pandemic appears to be accelerating an already existing trend for news media to move content back behind paywalls.[50]

Both the *Financial Times* and *Wall Street Journal* (*WSJ*) have been operating paywalls for some years. And this year *The New York Times* (*NYT*) – which has been operating a paywall for nine years – saw its subscriptions grow to six million, encouraging the paper to increase its prices for the first time since its paywall went up. This in any case became inevitable for the *NYT*, says the paper's CEO, due to the pandemic causing a fall in advertising revenue of between 50 percent and 55 percent compared to the year before. He added that he anticipates there will be "limited visibility beyond that".[51]

Moreover, new sites that have emerged have been demonstrating that charging for content can offer both a superior experience for the user and healthy profits for the service provider. To get a sense of this one could do worse than read Kent Anderson on the success of Substack. (See also this opinion piece in *The New York Times.*)

Might we also see the trend for moving scholarly journals from a subscription model to open access start to reverse?[52] Again, perhaps. The once free service Academia.edu (which allows researchers to freely share their papers with one another) has already moved to a position where most of its features are now only available to paying subscribers.

We should also note that the cost of scholarly journals has also historically been invisible to end users, since the bills are paid by librarians on behalf of researchers in the form of centrally paid subscriptions and/or so-called "big deals" (in which subscriptions to thousands of journals are bundled in one agreement). While this provides free-at-the-point-of-use access to scholarly content, it means that most researchers have little or no idea what their information needs are costing their institution.

Today, librarians are spending a lot of time trying to persuade faculty that subscription costs are unsustainable. It has not helped their cause that these same librarians historically signed non-disclosure agreements with publishers that limit what they are able to say publicly about journals costs. If scholars are not aware of the access costs that they are incurring for their institution it is hard to persuade them that there is an *affordability* problem.

OA advocates long argued that pay-to-publish gold OA (in which authors are required to pay an article-processing charge when they publish a paper) would force researchers to make

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[50] Where they do not, we are seeing closures. Just recently Murdoch announced that as a result of the pandemic those local or regional papers not thought to be sufficiently profitable to be made digital only will be closed – 36 in total.

[51] Although we could note that in August the *NYT* subsequently announced that "ad revenue fell 32 percent in the digital part of the business and 55 percent in print compared with the equivalent period last year. Total ad revenue fell to $67.8 million, from $120.8 million, a 44 percent drop. That figure fell short of the 50 percent to 55 percent decline forecast by Times executives in May." The paper added, "The company added 669,000 net new digital subscribers, making the second quarter its biggest ever for subscription growth. The Times has 6.5 million total subscriptions, a figure that includes 5.7 million digital-only subscriptions."

[52] In fact, this is already a thing, and has been characterised as a "reverse flip".

price-sensitive decisions about where and with whom they publish. This, it was held, would commodify publishing services, as journals vied with one another to attract authors.[53] It was expected that this would exert downward pressure on the costs of scholarly publishing. It turns out, however, that the theory was wrong.

What we have learned is that researchers view cost as less important than other factors when choosing where to publish, not least the prestige and/or impact factor of a journal. In addition, we are now seeing traditional subscription big deals being replaced by new-style OA big deals called transformative agreements (TAs).[54] With these, once again, the costs of scholarly publishing are invisibilised. And so once again, researchers have to take no responsibility for the costs they incur for their institutions (or funders).

As it has become evident that open access is unlikely to be any less costly than the subscription system we have seen calls for the research community to "take back control" of scholarly communication. The assumption is that publishers consistently overcharge for their services, and so the research community could do the job at a much lower cost. This has led to new scholar-led initiatives being established, particularly in the Humanities and Social Sciences (HSS). These include the Open Library of Humanities (OLH), Open Humanities Press, Lever Press, TOME, Open Book Publishers (OBP), Punctum Books, Mattering Press and so on. What these initiatives inevitably discover, however, is that while "*information wants to be free*" is a great slogan the reality is that it is not a costless process to provide publishing services. And even if OA advocates are right to argue that the research community could provide publishing services at a lower cost than legacy publishers, it is unlikely they could do so at scale.

Either way, those running scholar-led initiatives soon learn that the nitty gritty of operating a publishing service can be both time consuming and tedious. The necessity to "have a business model" seems a particular frustration. In a blog post earlier this year OLH co-founder Martin Eve concluded: "running a business model is expensive in terms of time and money … Once you start taking money, you need to set aside a portion of that income just to sustain the revenue-generating activities, rather than using the revenue to perform the original publishing activities that you wanted to do."

In short, researchers who decide to run a publishing service discover that it is not a simple thing to do and that there is no such thing as a free lunch, even on the internet. This truth became apparent last year to those researchers who had set up a preprint server using the infrastructure provided by the Center for Open Science (COS). In February, COS announced it was going to have to start charging those who use its infrastructure.[55] [56] More recently it has had to face the wall over storage costs too.

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[53] The unspoken (and incorrect) assumption here was that it does not really matter which journal a research publishers in. With megajournals like PLOS ONE emerging the notion that there is a need for discipline-specific journals was also challenged.

[54] Here is a description: "Transformative agreements are those contracts negotiated between institutions (libraries, national and regional consortia) and publishers that transform the business model underlying scholarly journal publishing, moving from one based on toll access (subscription) to one in which publishers are remunerated a fair price for their open access publishing services." It seems likely that the assumption that these agreements will transform the journals concerned may prove erroneous.

[55] See also here and here.

[56] And in September it was announced that the capacity of private projects and components utilising COS's OSF Storage to 5 GB and public projects and components to 50 GB.

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The cost issue is particularly pertinent when it comes to publishing OA monographs, which is an inherently more expensive process. Publishers have started to levy Book Publishing Charges (BPCs) of around $15,000 (see also) to cover the publication costs. Again, those running scholar-led initiatives argue that they can do it much more cheaply – at, say, £5,000 ($6,550).[57] The reality is, however, that even if it were possible to operate at these prices over the long-term authors get what they pay for (especially in terms of marketing)[58] and I expect most OA books will be published by legacy publishers who charge at the higher level. True, there are other business models for OA monographs (a recent report lists 14 different types) but they all face the same fundamental challenge: how do you fund an OA book publishing business outside of a for-profit environment over the long-term?

Again, it does not help that book publishing costs have also traditionally been invisible to authors. Conscious that OA advocates continue to insist that open access publishing is significantly cheaper than the traditional method (but that it may not be) some OA advocates have found themselves in the ironic position of arguing that it may be necessary for OA publishing costs to be hidden from authors, by using "the same invisibilising cost structure" that legacy publishers use.[59] Some might feel this is akin to libraries agreeing to invisibilise the costs of big deals by signing NDAs.

Be that as it may, what we learn is that the internet has not changed economic reality. And we learn that the time-consuming and complicated business of running a publishing operation is not something researchers generally enjoy. That should not surprise us (or them): if they had wanted to run a business, they would not have become academics!

The fact is that no information service can hope to persist over time absent a sustainable revenue stream (be it traditional subscriptions, pay-to-publish OA, covert monetisation of users' online activity, invisibilised costs, crowdfunding, grants, or something else). And if the source of revenue dries up (as grants almost inevitably do), services can disappear overnight – as Micronet discovered nearly 30 years ago.

That open access is no more immune to economic reality than traditional publishing first became evident back in 2007, when the editors of the OA journal *Biomedical Digital Libraries (BDL)* were confronted with the consequences of its publisher (BioMed Central) concluding that in order to continue operating it would need to hike BMC's article-processing charge from $525 to $1,400 (and increase its membership fees). Submissions to *BDL* quickly dried up and the journal had to close.[60]

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[57] See also this.

[58] In November the British Society for the Philosophy of Science (BSPS) announced a new program to publish open access philosophy of science monographs. It turns out that this will not include a print service or any distribution.

[59] Martin Eve, wrote, "The danger for new OA offerings is that … to meet demands from OA advocates and others who see declining library budgets that OA should be cheaper, they operate on a cost-driven model that focus on minimizing such costs." In other words, good quality publishing costs money and if you shave the costs you have to reduce the quality or (more importantly from authors' point of view perhaps) marketing and distribution of books.(See 8 and 9 in this FAQ, for instance).

[60] BMC founder Vitek Tracz had anticipated APCs would fall to zero over time. Today we see them constantly rising.

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And when in 2016 the same threat hung over the UK-based non-profit Knowledge Unlatched (KU), it only managed to avert a similar fate to *BDL* by undergoing a stealth conversion from a non-profit to a for-profit concern and selling itself to a German company. In its new guise, KU then set about developing business models that dismayed OA advocates.

Open access was initially viewed as a no-brainer. Today we see that what was once held to be so simple turns out to be considerably more complex, and somewhat more expensive, than anticipated.[61]

More pessimistic

Q: Have you learned anything that surprised you in the years of doing the Open and Shut interviews? Have your views changed in any way, big or small, since starting the blog?

A: I am surprised that, despite 20+ years of debate and discussion, most of the issues around OA remain to a great extent unresolved. Indeed, there still seems to be no consensus even over what exactly open access is. Oddly, we even seem to be moving to the point where some OA advocates appear inclined to deny that there is such a thing as an OA movement! (On this, see Richard Fisher's comments on **Page 95**).

I have also found it striking that discussions about open access are often circular and appear to take little regard of the fact that the geopolitical landscape has been changing, most noticeably – but by no means exclusively – as a result of the growing tension between the West and China and Russia.

This has made the issues around open access considerably more challenging. For instance, I do not believe the BOAI goals can be achieved without a high degree of global *collaboration*, *co-operation* and *sharing*. Likewise, it seems to me that OA cannot succeed unless *academic freedom* becomes a global norm. These things are, in my view, the "necessary conditions" for the success of open access. Yet right now they are under growing pressure as the geopolitical environment worsens and cancel culture intensifies. The rise in populism we have seen is a particular danger. There are other issues to consider here too, which I shall come on to later.

To this we now have the uncertainties introduced by the pandemic. We will have to wait and say what impact COVID-19 has over time, but I find it surprising when I read claims that the virus will see legacy publishers evicted from the Garden of Eden, to be replaced (presumably) by a publicly funded scholarly publishing infrastructure controlled by the academy, and that a new age of universal open access will unfold as a result. These claims seem to me to be somewhat over optimistic.

As I see it, the pandemic has been exacerbating global tensions, particularly between the US and China. And if the world's two largest producers of research papers are increasingly at loggerheads it is hard to see how OA can triumph, or the global research endeavour grow and flourish. Rather, I would expect it to have negative implications, both for scholarly communication and for open access.

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[61] See here for an interesting explication of how apparently simple things are in fact complex.

One worrying consequence of the international tension is that it could increase the likelihood that the internet will start to fracture. If this were to happen the very *raison d'être* of open access would begin to look moot. I will come back to this too.

What has also surprised me is the way in which OA advocacy quickly succumbed to the "true believer" effect (although in retrospect perhaps it should not have been a surprise).

What I mean is that quite early on many OA advocates seemed to stop being objective in their advocacy, as the "cause" began to take precedence over rational discussion, objective weighing of facts and clear headed assessment of the advantages and disadvantages of open access.[62] This has led many to ignore or dismiss the fact that OA advocacy has had unintended consequences. So, for instance, advocates at first denied, and then downplayed, the problem of predatory publishing that pay-to-publish OA introduced, and which (despite continuing demurrals from OA advocates) seems likely to have serious and long term negative consequences.[63]

Likewise, OA advocates failed to anticipate – and then for too long ignored – how their advocacy was allowing legacy publishers to co-opt open access, and in ways that work as much against the goals of BOAI as for them. And they have often downplayed the negative consequences that OA policies and initiatives developed in the Global North will have for those in the Global South.

What appears to have happened is that OA advocates became so fixated on *accessibility* that they are now willing to support and promote almost any initiative that promises to increase the number of papers available on an OA basis, regardless of whether the *means* used will pass all three BOAI tests.

Today, for instance, many are obsessed with counting how many OA papers there are[64] (and librarians spend weeks doing this). This has seen them applauding efforts to rank universities by a rough calculation of the number of papers deposited in their institutional repositories, while roundly condemning the ranking of universities using more traditional metrics.[65]

So, have my views changed? Yes, they have. I have become more pessimistic as to whether the open access movement can succeed. More specifically, I cannot see how, on its current trajectory, OA will achieve the three BOAI goals.

Let me say more about this:

1) OA advocates generally failed to win the hearts and minds of researchers. When this became apparent, they began to lobby governments and funders to demand that OA be made compulsory. In doing so, they did not anticipate that this would take open access in a different direction, one that has ended up subverting the BOAI goals and having adverse effects on scholarly communication and research more generally.

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[62] A somewhat non-scientific way of proceeding.

[63] See also this.

[64] And this is done without paying too much attention to the quality of the papers or their *discoverability*, which might seem to be the ultimate test of *accessibility* after all.

[65] True, in light of this some are trying to come up with more complex OA indicators to, for instance, better account for "the disciplinary specificities and the specialization of institutions makes comparisons based on the shares of OA publications biased." This way madness lies.

So we have seen the plethora of OA mandates that have been introduced (especially in Europe) increase the bureaucratic scrutiny and managerial control that researchers are subject to. These mandates have in many cases turned open access into something that resembles an administrative power grab more than a principled researcher-led movement focused on sharing research so that (*inter alia*) less advantaged researchers (especially those in the Global South) can join the "*common intellectual conversation and quest for knowledge*" that BOAI promised.

These mandates, and the hectoring and overly emotional moral tone that OA advocates sometimes deploy, tend to alienate more than convert scholars to open access. The mandates are also serving to further proletarianise researchers, eroding their independence, and chipping away at their *academic freedom* – which many consider to be a prerequisite for effective and innovative research to occur. The sometimes aggressive attitude of OA advocates has also led many researchers to avoid speaking publicly against open access[66] – which I cannot help but think is an odd outcome for a movement that emerged in a profession supposedly committed to collegiality and rational discourse.[67]

2) We are also seeing legacy publishers' grip on scholarly communication tighten rather than loosen as we move to an OA environment. This will not only see the Big 5 scholarly publishers (the "oligopoly") continue to charge for their services at levels librarians say are unsustainable but it will increase the power these companies have over the global research endeavour – for reasons I will explain later.

A study published in June concluded thus: "Our analysis of journals registered with the DOAJ Seal reveals a remarkable concentration of ownership. The four biggest commercial publishers are responsible for 63% of the titles indexed with the DOAJ Seal. If we add together the figures for all publishers owned by Springer (BioMed Central, Springer Open, and Nature), we find 35% of journals and 65% of articles in just one company … If we consider the other commercial publishers that have titles in OA, the concentration of the [scholarly publishing] oligopoly is even denser than the general publishing market."

3) In short, the OA movement looks as though it is being (or will be) derailed by forces outside its control: By publishers and funders for instance, but also by geopolitical forces. And many OA advocates seem either to be in denial about this, or have no adequate response.

One possible outcome is that greater *accessibility* will be achieved at the cost of both *affordability* and *equity*. I shall come back to these issues.

Bottom-up or top-down?

Q: The internet was originally viewed as a politically democratizing force. This has parallels in the scholarly publishing field. As you said in your eBook, "Open access advocates viewed OA as a no-brainer in an online world, and it was assumed that OA

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[66] Some OA advocates also attack their own, which saw the term #bropenscience coined.
[67] It has also led some researchers to attack open access advocates.

23 Open access: "*Information wants to be free*"?

would be a bottom-up revolution in which researchers voluntarily made their research papers freely available to all [.].” You are saying this is not the future that has come to pass. Is it mainly because the transition is proving slow, or because we are moving in a different direction?

A: It is both. The transition is proving very slow and open access is moving in a different direction to that envisaged by BOAI. Both these things are in large part due to OA advocates failure to win the hearts and minds of their peers. Herein lies a conundrum: We should not doubt that all scholars want free access to research, and they want as many people as possible to read their own research. Why would they not?

When asked, therefore, researchers have generally said that they support open access. In one early survey the vast majority (81%) even said that they would *willingly* make their papers freely available if they were mandated to do so. Subsequent events, however, have shown this to be a promise most were not prepared to keep.

That researchers at institutions with subscription big deals get free-at-the-point-of-use access to most of the journals they need has clearly not helped. Many do not understand the issues of *accessibility* and *affordability* that librarians keep banging on about. And I suspect that in today's hyper-competitive research environment, when push comes to shove, few are really concerned about *equity*. Anyway, for whatever reason most researchers have shown themselves to be surprisingly reluctant/unwilling to make their own research open access, especially if it requires any real effort on their part and/or the need to give up publishing in the journals they value.

This latter issue has led many OA advocates to conclude that the main obstacle to open access is that researchers are evaluated, judged and promoted not on the intrinsic value of their research but on the prestige and/or impact factor (IF) of the journals in which they publish. It does not help that most of the journals researchers want to publish in are subscription or hybrid journals[68] and, in the main, now belong to legacy commercial publishers – the companies that for so long resisted open access and who charge for their services at levels OA advocates believe to be unjustified and unsustainable.

In 2012, in order to try and weaken the grip that impact factors (and legacy publishers) have on the research community, the San Francisco Declaration on Research Assessment (DORA) was launched. DORA asks researchers and institutions to commit to no longer using "journal-based metrics, such as Journal Impact Factors, in funding, appointment, and promotion considerations." Research, DORA says, should be assessed "on its own merits rather than on the basis of the journal in which the research is published."

Eight years later 1,600 individuals and some 2,000 organisations have signed DORA. However, the number of universities that have signed appears not to be very high and very little seems to have changed in practice (as two of those involved in DORA seem to be acknowledging here). Moreover, some of the institutions that signed up, have been called out for not abiding by the commitment they made.

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[68] Hybrid journals are subscription journals in which articles can be made open access on payment of a publication fee

It has also been pointed out that DORA does not abjure metrics as such but mainly those metrics that favour legacy publishers.[69] For instance, it asks that publishers "Make available a range of article-level metrics to encourage a shift toward assessment based on the scientific content of an article rather than publication metrics of the journal in which it was published."[70]

True, DORA's aim here is to move assessment from journals to individual articles,[71] but as OA advocate Jean-Claude Guédon has noted, "numbers lend themselves to rankings, and rankings exacerbate the competitive dimension of research for reasons that are not always related to research, or may even be inimical to the design of optimal research processes." Others have suggested that DORA is based on a logical fallacy.

The larger problem here is that evaluating research papers on their intrinsic merit is a cost- and time-consuming activity, particularly in certain disciplines.[72] And in today's increasingly specialised research environment it can be difficult to find suitably knowledgeable people within an institution to judge a colleague's paper in an objective and unbiased way. In any case, people will always seek short cuts and using numbers and ranking systems is the quickest and easiest way to measure anything in today's scaled up and massified research environment.

The problem here is well expressed in Goodhart's Law, which says: "When a measure becomes a target, it ceases to be a good measure."[73]

We could also note that even though the UK's Research Excellence Framework (REF) instructs its evaluation panels not to make use of journal impact factors when assessing researchers and departments for QR funding, the journal IF continues to be widely used in research institutions as a proxy measure of the quality of papers and it surely influences the decisions of the REF evaluation panels, regardless of whether or not they are told to ignore it.[74]

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[69] In a ten-year anniversary report on altmetrics it was noted that while the initial focus was on the need for better filters, in practice, "altmetrics has primarily been seen as a way to get at measurements for other forms of impact or even just measuring faster forms of scholarly impact."

[70] There has been a protracted discussion about the relative merits of the IF (and similar measures) vs. altmetrics as ways of measuring the quality of individual articles. The argument is that the IF is a journal-level indicator and that it therefore tells us something about a journal as a whole, but not about an individual article in a journal. OA advocates generally castigate the IF and promote altmetrics instead. But as always, the issue is more complex than advocates will allow. A recent paper published on F1000Research discusses this and argues that at least some of the criticism levelled at the IF could be misplaced. The article concludes, "the use of the IF at the level of individual articles is often rejected based on incorrect statistical arguments. We believe it is time to develop a more nuanced perspective on the IF and on journal-level indicators more generally."

[71] This is a complex area. The *h*-index, which was developed in 2005 as an author-level alternative to the IF, is intended to provide a measure of both the productivity and citation impact of the publications of a scientist or scholar. It too, however, is widely criticised today.

[72] As the authors of this piece point out, the biomedical sciences is a field where the massive number of publications "makes any serious qualitative assessment of researchers' work almost impossible."

[73] There is a school of thought today that says that when it comes to awarding grant money a lottery system is as good as any method and can reduce bias and application costs. This is a sound thought!

[74] Science Europe acknowledges that "declaration signing does not in itself produce change, and [a 2019 study] highlights that some organisations that reduce or eliminate journal-based metrics (such as journal impact factor) still assess where research is published, for example by creating approved/reputed journal lists for cross-checking."

The REF is problematic for other reasons too of course, some of which problems open access was also intended to address. Oxford professor [Dorothy Bishop](#) has [complained](#), for instance, that the REF has created what she calls, "a distortion of incentives that has led to a focus on the production of 'world-leading research' and a consequent devaluation of more specialised research activities, and of teaching."[75]

It has also to be acknowledged that researchers will always seek out prestigious journals when choosing where to publish. How that prestige is perceived, and how it is measured, may not really be the issue. If journals ceased to be judged by their IF, for instance, they would be judged by some other metric(s) or value-based signifier(s) – perhaps the journal's name, perhaps the editorial board, perhaps the perceived brand of the publisher etc. etc. Since most of the journals that researchers value belong to legacy publishers, and are expensive (both in terms of subscription fees and APCs), the *affordability* problem seems unlikely to go away in an open access environment.

That researchers are not willing to give up publishing in the journals they and their colleagues and disciplines value (either because they have a high IF or because they are considered prestigious in some other way), or prepared to devote much time and effort to making their work OA, was confirmed by a [poll](#) of 12,000 French researchers undertaken last year by [Couperin](#), the French academic consortium.

With regard to open access moving in a different direction: as I noted, unable to persuade researchers to make their works open access, OA advocates started demanding that institutions, funders and governments compel their colleagues to do so by introducing OA mandates. These mandates have not only taken OA in a different direction but have become an (increasingly oppressive) burden on researchers. I don't believe that the level of scrutiny and compulsion they impose on researchers is good for them, for the wider research endeavour, or for science and scholarship more generally.

Even some OA advocates now worry about the use of OA mandates. In response to demands from fellow advocates for even stricter funder mandates OA advocate [Bjorn Brembs](#) [said](#) earlier this year: "why [are] individual researchers (the least powerful entity in academia) [proposing] policies that strive to cement their status as powerless policy recipients, rather than trying to empower researchers as the ultimate driving force of scholarship, worthy of the best support tax-funds can pay for?"

Elsewhere, [Egon Willighagen](#) has [pointed out](#) that the emphasis today is on "regulating what we do rather than providing rights."[76]

In any case, most authors remain unwilling to self-archive their papers in their institutional repository even when mandated to do so. As a result, librarians have had to take on the task for them, making the term "self-archiving" somewhat oxymoronic. And librarians have discovered that doing this is an expensive, time-consuming and difficult task for them, not

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[75] Another word constantly used by university evaluators and funders is that of "excellence". But as the authors of [this](#) article argue, the term has "no intrinsic meaning in academia".
[76] Rick Anderson has [suggested](#) that the movement is at a crossroads in which it will either remain pluralistic or become monocultural and authoritarian. As things stand, it seems to me that, as a result of funder and government intervention, the latter is a more likely outcome.

least because they don't generally know what, when and where researchers are publishing.[77] Indeed, in many cases the task is nigh impossible.[78] Obtaining the necessary information, and then doing the deposit work on behalf of authors, has therefore exacerbated the problem of *affordability*.

For their part, publishers – who have always resisted green OA – responded to self-archiving by imposing embargoes on the papers that they publish before they can be made freely available.[79] This not only increased the difficulties libraries face when depositing and managing papers in repositories[80] but it delays the point at which papers can be made open access (by between 6 and 48 months) – even supposing librarians can navigate the multitude of different publisher rules on self-archiving.

True, two publishers *have* agreed not to impose embargoes, but two is a drop in the ocean. Moreover, in making this decision these two publishers were doubtless heavily influenced by the fact that we have seen a gradual shift in emphasis from green OA to pay-to-publish gold OA (certainly in the Global North).

In fact, pay-to-publish gold OA might seem to have reached its apotheosis today with the trend for libraries and consortia to sign "transformative agreements" (aka read-and-publish, publish-and-read or transitional agreements) with legacy publishers. What is evidently attractive to librarians and institutions about these agreements is that by signing them they can offload the hard work of OA compliance to publishers. They also allow for immediate embargo-free open access.

Another attraction is that (in theory) these agreements allow universities to use the money they currently spend on journal subscriptions to pay for *both* access to paywalled content *and* OA publishing costs – in one bill. The hope is that this will allow scholarly publishing to shift ("transform", or "transition") from a world of paywalls to one of universal open access, without universities having to pay both subscription fees and APCs for the same journals during the transition (i.e. avoid double dipping).

One problem is that these agreements lock legacy publishers into the new OA environment without providing any more effective way of containing prices than was available in the subscription model.

A further problem is that in moving from subscriptions to pay-to-publish, research-intensive universities – those institutions that have been most active in advocating for OA – have

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[77] See here for a sense of the complexities and the way that transformative agreements are making the situation worse.

[78] See this for instance.

[79] The thinking is that green OA is "unfunded" and that if it is successful it will destroy the subscription business model. As Springer Nature put it recently, "the best way to ensure that full research results are shared freely and quickly is by publishing them via a Gold OA publication model. This is the only sustainable model that guarantees immediate and perpetual access to the final version of record (VoR)." Or as Cambridge University Press put it, "Our chosen route is to focus on the final published versions (Gold OA), because we see that as financially sustainable. Making pre-final versions open access without embargo (Green OA) is not sustainable because of its dependence on subscriptions to closed journal content."

[80] It means, for instance, librarians have to check the journal's embargo policy every time they deposit a paper.

discovered that they can expect to have to pay _more_ not _less_ towards the costs of scholarly publishing in an open access world.[81]

This is because where the traditional subscription model shares the costs of publishing more evenly across institutions,[82] in a pay-to-publish OA world a higher proportion of the costs logically falls on the shoulders of those institutions that publish most scholarly papers (i.e. research-intensive universities).[83] A librarian at the University of Washington estimated that if the university signed up to the ACM's transformative model its costs would increase from $7,000 per annum to $100,000.

Elsewhere, a 2016 analysis by the University of California (UC) found that the total outlay by a single research-intensive institution could more than double, to more than $10 million annually."[84] And the University of Cambridge estimated that signing a transformative agreement would mean a more than a 3-fold increase in costs.

In short, in an OA world those universities who publish most of the world's research papers can expect to face an _increase_ in costs, not a _reduction_.[85] This has clear implications for _affordability_.

Attempts are therefore being made to adapt the pay-to-publish model so that those institutions who publish fewer papers (_read_ institutions) subsidise the costs of research-intensive institutions (_publish_ institutions).[86] [87] There is here a danger that some might feel it fails the _equity_ test. It could certainly be controversial and some _read_ institutions will resist.

For this reason, University of Illinois at Urbana-Champaign librarian Lisa Hinchliffe has expressed some scepticism as to whether publish-and-read and transformative agreements offer a stable and sustainable model. Speaking to _Wired_, she pointed out that as more major universities switch to pay-to-publish deals more work will be freed from paywalls. If enough big institutions sign such deals, she added, smaller teaching institutions – the places where scholars mainly want to _read_ research, not _publish_ it – will be able to cancel their contracts since most of the research they will need will become freely available.

Why would _read_ institutions want to subsidise _publish_ institutions? Hinchliffe asked. "I assure you they won't be sending their money to the big research university so they're able to publish." Consequently, she added, either the big universities and their research funders are going to have to pay more, or the publishing industry is going to have to earn less.

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[81] This is the quandary the University of California faced in its standoff with Elsevier. It claims to publish 10% of all US research papers yet expected Elsevier to reduce rather than increase what it charges the university in an OA environment.

[82] That is, costs are borne by both readers and authors, not just the authors (or their institutions).

[83] The issues are well explain in this interview with ACM's Scott Delman.

[84] A comment submitted to OSTP from Cambridge University Press argued: "America is a large producer of research and therefore the publication of America's research output has been, to some degree, subsidized by subscriptions paid by the rest of the world. The move to open access will require America to pay the full costs of its research publishing."

[85] Of the 6,000 institutions subscribing to American Chemical Society's journal packages, between 300 and 500 produce 85% of published papers.

[86] As we shall see later, PLOS has announced what it calls its "Community Action Publishing" model.

[87] These issues being mulled over in many venues today.

"Eventually, this is going to be a major problem, and I think the major publishers are quite aware of that."[88]

For research institutions this introduces the classic free rider problem, where people are able to use a product or service without paying for it, or paying what those who bear the bulk of the costs may view as an unfairly low price. As we shall see, this is an issue that continually crops up in discussions about open access.

In an attempt to spread OA publishing costs more evenly across the research community, in October PLOS launched its Community Action Program (CAP), which I will say more about later.

Understandably, publishers want to try and manage the transition to OA in a way that protects their current revenues and profits. OA advocates, by contrast, want to see publishers' profits fall. But if prices fell too far publishers might go out of business or exit the market. While some OA advocates would welcome that, it is far from clear that the research community could take over – as I shall discuss later. Again, a central problem is that no publisher has convincingly demonstrated what a fair price for publishing a research paper is, and since the research community is not able to establish that for itself, many are convinced that publishers overcharge universities. This tends to complicate many conversations about open access.

Realising that it could end up paying a lot more in an OA world, the University of California has come up with what it calls a "Multi-payer Model". Here UC aims to sign transformative agreements with publishers in which the university only pays the first $1,000 of any APC, with authors expected to pay the remainder themselves, utilising any research funds available to them. If a researcher has no external funding to draw on UC will pay the full cost. This raises the possibility that rather than *publish* universities paying more, or publishers receiving less, some of the costs could be transferred to funders. Since this would reduce the money available for research it has consequences.

The multi-payer model was central to June's loudly trumpeted deal between UC and Springer Nature. However, since authors are able to opt out, we might wonder whether many will prefer to continue publishing their papers using the traditional subscription arrangement. This would allow them to avoid having to rummage around looking for funds or spend time convincing UC that they do not have access to other funds. What seems clear is that researchers don't generally want to spend their precious grant money on publication charges.

Meanwhile, publishers are increasingly focused on developing new products and services to sell to the research community that will earn them revenue in new ways. Their hope is that they will be able to augment, or even greatly increase, what they currently earn from the research community – as I shall also discuss later.

Fracturing

Q: You say in your eBook that a geopolitical fracturing of the internet would inhibit OA efforts across borders. For example, China and the US would not agree on a "Plan S" type

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[88] As a document produced by SPARC in June, notes, "Every [transformative] deal signed lowers the value of '*read*' subscriptions at all other institutions (because more of the content is available OA)"

publishing strategy even now, and in the future the internet connections between the two might be closed entirely. If the internet fractures in such a way across the globe, is open access worth pursuing within respective nations that support it?

A: I will say something about China below, but I have seen no convincing evidence that it intends to sign up to Plan S.[89] But let's first consider the situation in the US. Late last year, rumours began to circulate that Trump was planning to sign an executive order (EO) that would require publicly-funded research papers to be made immediately open access.

The assumption was that this would be an update to the green OA policy introduced by Obama in 2013 (which permits publishers to insist on a 12-month embargo before papers are made open access). This led some to conclude that the US was moving to a position in which its OA policy would be conformant with Europe's Plan S and a couple of tweets from the US Office of Science and Technology Policy (OSTP) at the start of the year encouraged this view.

In February, however, OSTP said that it had decided to consult further with stakeholders and released an RFI seeking more input. This could be interpreted as a sign that the administration had had second thoughts. At the end of March, the deadline for the RFI was extended until May 6th, and the responses are now available here. We will have to wait and see what develops once Biden takes office. There has certainly been a lot of lobbying going on – from both sides.

If the US green OA policy does change in this way, it could have a similar effect as Plan S is having in Europe and accelerate the uptake of transformative agreements in the Global North. After all, it is possible to comply with any green OA mandate by publishing in an OA journal and, as noted, gold is a much easier option for researchers, for librarians and for universities. A number of US universities have signed transformative agreements this year, including the University of California (also here, here, and here), Iowa State, MIT, Michigan State, Louisiana State, Montana State, Carnegie Mellon, Ohio State, the University of Florida and California State etc. We are also seeing a trend for universities to sign "pure play" (or pure publish) OA agreements with open access publishers like PLOS (also here, here and here), Frontiers and JMIR.

In any case, it is possible that we have reached the point (in the Global North at least[90]) where transformative agreements are acquiring a momentum of their own and the market is beginning to take over. If this does happen, it seems unlikely that the three BOAI goals will be achieved. Certainly, it is hard to see how either transformative or pure-OA agreements can solve the *affordability* and *equity* problems.

That said, there is a separate trend in the US that might point to a different future, and the pandemic could accelerate this – as I shall discuss later.

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[89] True, some Chinese librarians did at one point express an interest in both Plan S and OA2020, but these were librarians, not the Chinese government or a government funder. When one of those librarians was asked if China was going to sign up, he replied, somewhat gnomically, "Whether or not you sign up to Plan S is not a test."

[90] Although it seems that the transformative model is beginning to gain traction in the Global South too, not least in South Africa and Brazil.

As to the likely consequences for open access of an internet fracture (which seems increasingly possible): I think they would inevitably be negative. We could see a **physical** fracture, or what one might think of as a **virtual** fracture. In both cases, access to research could be restricted by country, region etc.

With regard to a **physical** fracture, we have in recent years seen predictions of what is being called a "splinternet." The scenario here is that today's single continuous global network could at some point split into a series of national or regional intranets that would cease to be connected to one another; or connected on a much more limited basis than today. In fact, many say this is already happening. As I noted, countries like China, Russia and Iran seem bit by bit to be detaching themselves from the global network; and I shall suggest later that both Europe and the US could be moving in this direction too.

One possible consequence of this could be that the core standards, protocols and technologies that make the internet interoperable would start to drift, with different parts of the network ceasing to be able to work together, perhaps drifting to the extent where it would no longer be possible to reconnect the different parts at a later date, even if there were a desire to do so.

Current moves to ban or limit use of Huawei's 5G technology – which is central to the next generation internet – could lead to this. This trend was started by the US, which is also coercing other countries into following its example. In July, for instance, in response to pressure from the US, the UK government undertook a U-turn on its previous policy and announced that, out of security concerns, all Huawei 5G kit will have to be removed from UK network by 2027.[91] This policy was further strengthened in November.

In the meantime, China has been trying to get the International Telecommunication Union (ITU) to agree to what has been dubbed "New IP" – a Huawei-driven initiative aimed at replacing the current bottom-up laissez-faire internet with one that permits top-down control. Amongst other things, this would enable countries to achieve "cyber-sovereignty" whereby control of the network, both its development and its operation, is passed to centralised telecommunications powers that, in many countries, are run by governments. One big attraction of New IP for China and other authoritarian states is that it would make it much easier to crack down on dissidents.

It is not anticipated that China will succeed in getting its New IP proposal passed by the ITU. But the increasing gulf between authoritarian countries, who desire a top-down internet, and those who prefer the current decentralised, self-governing network, seems set to take the world in the direction of a splinternet. As C|Net points out, whatever happens to New IP we can expect to see countless small steps being taken away from today's internet norms in the name of digital sovereignty. "Those steps could accumulate to cause major incompatibility problems." In other words, adds C|Net, today's internet may "die from a thousand cuts".[92]

I will come to the possibility of a **virtual** fracture in a moment. But let's first apply the three BOAI tests to the mooted splinternet.

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[91] The UK's turnaround came after the US Commerce Department on Monday announced in August that it was imposing fresh sanctions designed to restrict any foreign semiconductor company from selling chips developed or produced using US software or technology to Huawei, without first obtaining a license to do so.

[92] See also this background article in the *Financial Times*.

If there were a splinternet, works that were open access on one part of the internet would likely not be freely available to those on a different part of the network. In other words, researchers not connected to the part of the network where a work has been made OA would not have access. How this might work technically I leave others to ponder over but it might seem to suggest that in order to read papers that are open access on a different part of the network it would be necessary to pay access fees (assuming paid access was available). This would seem to fail the *accessibility* test.

In addition, if they wanted (or were required) to make their own work open access, researchers (or their institutions or funders) would likely have to pay a publishing fee. But if this only made their papers open access on a limited geographical basis it might seem to fail both the *accessibility* and the *affordability* tests and could be viewed as a new type of double dipping.

Due to their disadvantaged financial situation a splinternet would impact unfunded researchers, and those in less affluent countries, disproportionately. Researchers in the Global South are already seeing paywalls replaced by publication walls (if they want to publish in an international journal). With a splinternet they could face national firewalls too. If this were to happen, they would continue to experience all the problems that BOAI was intended to solve – i.e. those of *accessibility*, *affordability* and *equity*.

If we turn to the possibility of a **virtual** fracture, we are confronted with what can only be described as hypocrisy on the part of the Global North, and Plan S would seem to demonstrate this well. As noted earlier, Plan S is the initiative of a consortium of primarily European research funders called cOAlition S. Announced in 2018, the stated aim of Plan S is to ensure that from 2021 all scientific publications resulting from research funded by members of the coalition will be made open access in compliant open access journals or OA platforms.

As a European project, most of the cOAlition S funders are based in the Global North, although the coalition has consistently sought (somewhat unsuccessfully) to persuade funders in the Global South to sign up as well.

An important part of the sales pitch for Plan S is that it will enable researchers in the Global South to get free access to papers in international journals that they cannot currently afford to subscribe to. What cOAlition S apparently did not consider is that the pay-to-publish model that Plan S looks likely to make universal will see publication walls become ubiquitous, and since researchers in the Global South (or their institutions) cannot generally afford to pay thousands of dollars per paper in publication fees they will remain at a significant disadvantage.[93]

This has seen countries in the Global South understandably shy about joining Plan S. Even some of those who expressed initial interest – e.g. India – later changed their minds.[94] When this reluctance became evident cOAlition S funders' altruism appeared to evaporate.

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[93] For a sense of the challenges that African researchers face over pay-to-publish see this article.
[94] Two other funders, from Sweden and Italy, changed their minds. As did the European Research Council in July.

This at least was the conclusion many reached when last year – frustrated at the low number of funders signing up to Plan S – the then member of the cOAlition S Executive Steering Group (and open access envoy for the European Commission) Jean-Claude Burgelman suggested that Europe might need to adopt a "geo-specific access model". As he put it, "we can't wait for the whole world to be open access at once."

Burgelman appeared to be saying that those national/regional funders who do not join cOAlition S – or make their research open access in the same way as cOAlition S members plan to – could see their researchers blocked from accessing research funded by cOAlition S members, even where it is technically OA. Access would presumably be restricted by IP address or some similar non-physical barrier. This is what I mean when I talk about a **virtual** fracture. In effect, however, it might seem little different to a splinternet.

For me, the take away point here is that the way open access is developing (driven by Europe and the Global North, which has greater power and financial clout, and whose current actions seem destined to create a pay-to-publish world for everyone) means that rather than being able to join in "*a common intellectual conversation and quest for knowledge*", those in the South could see paywalls replaced by a combination of geowalls, publication walls and, in time, possibly a technical (**physical**) wall as well.

It is also worth noting that in a balkanised internet the current drive to agree transformative agreements with legacy publishers might seem little different to signing a national licensing agreement, except that instead of paying subscription fees, research institutions would pay publishing fees.

A national licensing model was, by the way, first tried in the UK 24 years ago (1996) – when HEFCE[95] (now part of UKRI) agreed a licensing deal with Academic Press (now part of Elsevier) to allow all UK researchers to get free-at-the-point-of-use access to AP's entire journal portfolio.[96]

This approach subsequently fell into disfavour, mainly I think because the costs of the HEFCE agreement were paid centrally by the government (top-sliced), rather than by individual institutions.[97] Universities felt this gave them less control over their budgets and reduced their freedom to manage their own affairs – even though by being able to negotiate on a UK-wide basis, HEFCE was (in theory) in a position to get a better deal and exert downward pressure on prices.[98]

Nevertheless, this model became the template for the widely adopted but increasingly controversial big deal. The main difference is that big deals are not normally national deals

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[95] The Higher Education Funding Council for England.

[96] So far as I am aware, this was the first big deal ever signed, and at time when journal licensing deals were signed by individual institutions not consortia, and certainly not on a country-wide basis.

[97] Such a model would be more difficult in the US because its university system is far less centralised.

[98] Today, Jisc Collections plays a similar role but, as I understand it, universities decide whether or not they want to take advantage of the deals that Jisc negotiates (and then they pay from their own budgets). It is also not clear that Jisc has ever successfully leveraged the collective bargaining power it has at its disposal to exert downward pressure on prices. Certainly, it has been criticised for failing to do so. We have learned that the licences negotiated by Jisc for UK universities saw them pay big publishers £1 billion in the past decade. As things stand, we can expect to see the same £1 billion paid in APCs rather than subscriptions.

paid for by the government but deals between a publisher and a university or consortium where the fees are paid by individual universities.[99]

What is striking today is that as the emphasis in the Global North has shifted from green to gold OA, so the idea of a national agreement has re-emerged. For instance, in 2015, in the wake of the Finch Report (which for the first time proposed gold OA as the primary route to open access[100]), UCL Vice-Provost David Price called for what he specifically characterised as a "national licence".[101]

Explaining why he thought it was necessary, Price said that if the UK opted to pay for gold OA when other countries were not doing so, it would give researchers in other countries "better access to UK research while doing little to improve the access of those within the UK to research produced elsewhere. That is not in the national interest."

Then in 2017, when Elsevier concluded that a gap was opening up between those countries pursuing a gold OA approach and those preferring green OA, the publisher suggested a geo-blocking approach to OA be taken.

It is hard not to conclude that if paying to make a paper open access only made it freely available on a national or regional basis, APC prices would be viewed as even more exorbitant than OA advocates insist they already are. It would certainly seem to make a mockery of the notion of open access.

Once again we bump up against the free rider problem that repeatedly arises in discussions about open access and which Hinchliffe was referring to when she suggested that *read* institutions would be unwilling to subsidise the publishing costs of *publish* institutions. This issue was also raised by UK Minister of State for Universities and Science David Willetts in a 2012 speech he made shortly before the Finch Report was published. "At the moment, American and Chinese libraries have to pay for journals containing the results of our scientists' research," he said. "In future we could be giving our research articles to the world for free via open access. But will we still have to pay for foreign journals and research carried out abroad? If so, would we not only have undermined a business model but an export industry too?"

Willetts proposed that in order to avoid this, international collaboration would be necessary. Eight years later international cooperation over open access continues to prove elusive, as cOAlition S has discovered.

In short, Burgelman's proposal was just the latest in a series of similar proposals designed to prevent other countries having free access to a nation's research unless they agree to make their research available on the same basis.

That this keeps cropping up in discussions about open access reminds us that – whatever people might say to the contrary – today's political and academic zeitgeist is not one of

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[99] But see the recent proposal in India for a "One nation, one subscription" arrangement which I discuss on **Page 149**.

[100] Finch recommended, "a clear policy direction should be set towards support for publication in open access or hybrid journals, funded by APCs, as the main vehicle for the publication of research, especially when it is publicly funded."

[101] More on this can be read here and here.

international *cooperation*, *collaboration* and *sharing*, but of intense competition. And the competitive attitude underlying this means that concerns about free riding keep recurring.[102]

Burgelman underscored just how competitive the world of research has become earlier in the year when he spoke at the APE conference in Berlin. In reporting on the conference, Roger Schonfeld characterised Burgelman's talk as "eye-opening" in the way it revealed Europe's obsession with having "competitive geopolitical influence". The talk, he added, was expressed "in deeply competitive terms about Europe's scientific sector."

To come back to China: I think we can also see signs of a potential splintering of the Northern-controlled international publishing system that emerged in the wake of WWII. For instance, China is now intent on restricting its researchers' use of the international system in order to prioritise Chinese solutions.

To this end, in 2018 it was announced that China had committed to spending $29 million a year for five years to improve the standards of some 280 Chinese journals. As *Nature* pointed out, one of the main aims is to boost China's own research-publishing industry, "which the government has wanted to do – but which is difficult if the best research is published internationally." [103]

And this year China signalled that it wants to move away from using the Western-based Impact Factor and Science Citation Index (SCI) as key indicators – in favour of its own (mooted) system. This too would lead to Chinese scientists publishing more of their research in Chinese journals rather than in international journals.[104]

The result could be a chipping away of the West's current dominance in scholarly publishing.[105] Alternatively (combined with the geopolitical tensions we see today), it could pave the way for the international publishing system to fracture and separate, much in the way that some believe the internet will.

Meanwhile, a group of revolutionary socialists in Canada are proposing that the Canadian scholarly publishing system be nationalised. The logical consequence of what they are suggesting might seem to be that Canada disconnect itself from the international publishing system and set up a "nationalized journal." Would any of this help achieve the BOAI goals?

Open science

To return to your question about whether – if we saw a fracturing of the internet – it would be worth pursuing open access in just one country: sharing research on a national intranet would

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[102] This issue is also raised by Fisher in the context of BPCs.

[103] *University World News* reports that in future, "Chinese scientists will still be encouraged to publish outstanding work in leading international journals (such as *Nature*, *Science* and *Cell*), but research that appears in less influential journals in the SCI index will no longer attract government funding."

[104] Under the proposal Chinese researchers would have to publish one third of their representative papers (papers considered for evaluation) in Chinese journals

[105] It is worth noting that China is now said to be the largest producer of scientific papers in the world. It is also said to publish around 500 science journals in English and 2,000 in Chinese. (A figure some say significantly understates the real situation).

doubtless still be desirable but, as I have suggested, it might seem little different to a national licensing arrangement. It would also seem unlikely to achieve the BOAI goals.

The questions I think we need to ask are these: Can geo-walled access really be described as open access?[106] Also, is there really a meaningful difference between a country, region or consortium signing a subscription (*read*) agreement that provides qualifying researchers with free-at-the-point-of-use access to all the publisher's content *plus* the ability to publish for free (with charges based on the number of readers) **but** with the papers published only freely accessible to those based in the nation, region or consortium that has signed the deal, **and** a country, region or consortium signing an OA transformative (*publish*) agreement that provides qualifying researchers with free-at-the-point-of-use access to the publisher's content *plus* the ability to publish for free (with charges based on the number of papers published) **but** with those papers only freely accessible to members of the country, region or consortium that signed the deal?

True, in the case of a virtual fracture, a transformative agreement might provide free access to a larger number of readers.[107] In addition, copyright in papers would likely remain with the author rather than be transferred to the publisher. But we need to remember that OA mandates like Plan S usually now *require* authors to attach a liberal Creative Commons licence (e.g. CC BY) to their papers so that they are available on a reuse basis (including for commercial purposes).

Since mandated CC BY deprives the authors of agency over how their work is made available (as the terms on which it is published are decided by funders), researchers might feel it is little different to assigning copyright to a publisher under a traditional publishing agreement (where the terms on which it is published are decided by the publisher). In both cases, it is not the authors who get to decide how their work is distributed and shared, but funders or publishers.

Liberal licences also raise a set of other concerns, not least the likelihood that commercial publishers will be able to continue appropriating and monetising publicly funded research in undesirable, and perhaps even more exploitative, ways than OA advocates say they do with the subscription system. More on this later.

Having said all that, I want to broaden our view and consider your question from the perspective of open science (which open access can be considered a subset of) and open data. Here our considerations might be different. Right now, for instance, the research community is in the grips of a "reproducibility crisis". This is associated with a rise in research misconduct, a fall in research integrity and a worrying increase in sloppy and dishonest research practices, including selective reporting, p-hacking (conducting repeated analyses

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[106] OA advocate and BOAI attendee Peter Suber said this in 2003, "'open access' to one country and not others isn't really 'open access'"
[107] Because presumably if a number of countries, regions or consortia agreed to make their research available on the same basis as each other they would allow each other's researchers to have access to each other's research, while barring others. However, due to the costs of pay-to-publish, those in the Global South would be unlikely to be able to provide open access on the same basis as those in the North if pay-to-publish becomes the norm – raising issues of both *affordability* and *equity*.

until a desired outcome is obtained, without sufficient statistical correction) and HARK-ing (hypothesizing-after-the-results-are-known).[108] [109]

Part of the problem here, of course, is the infamous "publish or perish" culture of academia (which in one case has led to a professor publishing a paper every 2 days!). Consider in this context a comment made by the authors of one recent paper (see footnote).[110] [111] The other problem we face today is that of "publication bias", where the outcome of an experiment or research study influences the decision whether to publish it, or put it in the drawer and forget about it As a result, only papers that show a significant finding tend to be published, creating a bias in favour of positive results.

Against this background, we are seeing demands that researchers pre-register the rationale and hypotheses of their research questions – along with their planned methods and analyses – prior to undertaking the work.[112] There are also calls for researchers to openly share their experimental data, along with the code to implement their methods and statistical analyses. The objective is to make research *processes* sufficiently open and transparent that other researchers can validate the results, not least by seeking to replicate them.

This is a very desirable development because it aims to create an environment in which the research community is better able to take an informed (scientific) view as to whether a piece of research can usefully be built on, or whether the authors' methods, interpretations and/or results are sufficiently unreliable (or plain wrong, or fabricated) that it would be better to park (or even retract) the research. This goes to Karl Popper's concept of "falsifiability", which is viewed as essential to the progress of science.

Or as Mackenzie Wilson puts it in the film *2036 Origin Unknown* "The cornerstone of science is repeatable results."[113]

We might, therefore, want to conclude that while signing a read-and-publish or transformative agreement may end up being little different to signing a national or regional subscription big deal, and so somewhat restricted in scope (certainly in terms of the BOAI goals) improving the transparency of research *processes* is highly desirable even if done on a more limited (e.g. a national or regional) basis. Open science, of course, is a somewhat larger topic than OA, and some might argue that right now greater *process* transparency is more important than the more limited openness envisaged by making the content of research papers

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[108] Note that reproducibility is not the same as replicability, and the growing use of machine learning models complicates the discussion. Note *also* that some believe there is an unhelpful confusion between the terms "open science" and "reproducible science".

[109] For a sense of how bad things have become one could do worse than read this review of a new book edited by Mario Biagioli.

[110] "It is difficult to convey just how low the standards are. The marginal researcher is a hack and the marginal paper should not exist. There's a general lack of seriousness hanging over everything – if an undergrad cites a retracted paper in an essay, whatever; but if this is your life's work, surely you ought to treat the matter with some care and respect."

[111] Dorothy Bishop talks of the four horsemen of irreproducibility.

[112] New rules are also being introduced that require sponsors of clinical trials to report their results on a public database within 1 year of completion

[113] I do not, by the way, recommend this film!

freely available. Indeed, some believe that open data is far more important and valuable than open access.[114]

However, it is clear that requiring open science and open data will further increase the costs of doing research. As Plan S Ambassador Sabina Leonelli has said, making research data available requires a lot of extra work, money and skills and researchers don't generally have these today. This suggests to me that the problem of *affordability* can only intensify going forward, leaving aside issues of *accessibility* and *equity*.

Populism and academic freedom

Q: How does the rise of populist political movements affect research in general, and scholarly publishing in particular?

A: I am no expert in these matters, but it seems to me that in populist eras we see greater authoritarianism and ideological narrow-mindedness. Populist movements also promote nationalism, and both phenomena seem to lead to politicians, nationalists and special interest groups seeking to interfere with science, scholarship and the research process in inappropriate and often irrational ways. This is not good for the research endeavour.

The Trump administration, for instance, sought to discredit, defund, ignore and even suppress and delete research it did not feel fitted with the Trump agenda. It also sought to control who in the research community can sit on scientific advisory boards – most noticeably in the context of the Environmental Protection Agency (EPA) and its Advisory Board. Trump's attitude to scientists, to science advisors and to science, along with his behaviour and the eccentric views he expressed during the pandemic, made him look decidedly anti-science.[115] Certainly, in the words of Science he "deliberately lied about science in a way that was imminently dangerous to human health and directly led to widespread deaths of Americans."

In addition, in populist times the public tends to be more sceptical of science, of scientists and of scholars.[116] That is, populism seems to be associated with a distrust of experts and perceived elites, and an anti-intellectual mindset. Amongst other things, this means that if their research or ideas conflict with the ideological and emotional prejudices of politicians – or of nationalist or special interest groups – scholars can find themselves criticised and attacked in sometimes very unpleasant ways. Apart from what we saw in the US under Trump, we see this today in countries like Brazil, Poland, Hungary and Turkey.[117] I would expect to see this kind of pressure on science and scientists intensify and grow in parallel with any rise in populism.

The key point is that these attacks appear to be undertaken not as a result of any scientific disagreement but for political and ideological reasons. Apart from anything else, this is not good for *academic freedom* since it assumes that politicians and lay members of society are

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[114] In fact, at a recent UNESCO webinar one presenter suggested that sharing research papers is not actually necessary. Researchers need only share their data, he suggested.

[115] The Silencing Science Tracker has been cataloguing this since the 2016 US election.

[116] It does not help that many scientific articles are full of overly technical language and jargon, that tends to alienate the public.

[117] The same issue appears to be emerging in the Czech Republic and Bulgaria, with clear implications for *academic freedom*.

free to interfere with the research process simply because they don't like the questions scientists and scholars are asking, or the conclusions they are reaching.

In terms of scholarly communication and open access, I said earlier that I don't believe OA can prosper without widespread (global) and routine *collaboration*, *co-operation* and *sharing*. Populism and nationalism seem inevitably to restrict these things, not least because the international perspective that is considered essential for scientific progress narrows, to focus on national interests alone. The director of the Coalition for Networked Information (CNI) Clifford Lynch has characterised this as "scientific nationalism".[118]

Populism (and the nationalism that accompanies it) also tends to lead to trade wars, trade sanctions and travel bans. This too is bad for research. Due to the US travel ban on Iran, for instance, visa denials and delays prevented many Iranian scientists and students from attending research conferences, or studying, in the United States. This clearly limits *collaboration*, *co-operation* and *sharing*. And the number of countries targeted grew over time – see here for some of the implications for Nigeria when Trump put the country on his list. The good news is that Biden has said he will lift the Trump travel bans.

Moreover, targeting one country can impact on researchers in other countries too. US action against Iran, for instance, affected European researchers' ability to *collaborate*, *co-operate* and *share*.

In addition, researchers in countries that have had sanctions imposed on them may find that they are unable to send money to the West and one consequence of this is that they are not able to pay APCs to make their work open access in international journals.

Those who say that health crises like COVID-19 inevitably increase scientific *collaboration*, improve scientific communication and enhance open access might want to reflect on the fact that Trump used the pandemic as an excuse to suspend immigration and to "gut the EPA".

We also saw Trump and Mike Pompeo claim that the Wuhan Institute of Virology in China was responsible for the emergence and global spread of COVID-19 (what Trump insultingly refers to as "Kung Flu"), without producing any credible evidence to support the claim. In response, China alleged that the US army brought the pandemic to China in the first place – again without any evidence.

Accusations like these are made for narrow political *ends* and it suggests to me that during periods of populism science is dangerously vulnerable to being co-opted by politicians and ideologues for political purposes. Add a pandemic to the mix and the situation is likely to be even grimmer.

Q: Can you say more about the threats to academic freedom you see?

A: I think the main threats that *academic freedom* faces today come from academic neoliberalism, including Taylorism[119] (which open access mandates are facilitating and

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[118] A term later used by *The Times* in connection with the response to the race to find a remedy for COVID-19.
[119] Otherwise known as scientific management, this is a theory of management that analyses and synthesizes workflows. Its main objective is improving economic efficiency, especially labour productivity. This is not without its critics in the context of industrial production; it is highly questionable that it has any place in academia.

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intensifying) and from nationalism and populism – which, as I have said, encourage politicians, special interest groups (and public pressure more generally) to interfere in the activities of researchers, of universities and the research process.

This interference erodes the independence of researchers not least because it can limit their ability to decide what research they undertake, and the way in which they conduct it. If one believes (as I do) that governments and countries should always make evidence-based decisions when choosing how to manage their country and how to govern, organise, support and protect citizens, this might seem a case of the tail wagging the dog. Either way, it erodes and constrains *academic freedom*.

The real danger is that when politics, or ideological predilections and prejudices, trump (apologies for the pun) science then wrong-headed, dangerous and even life-threatening societal decisions are likely to be made. The deletion and defunding of climate change research might seem a case in point. Perhaps the way in which studies about hydroxychloroquine were undertaken during the pandemic and then treated as a political football is another. And the way in which the US Center for Disease Control had its guidance documents on COVID-19 revised by political appointees in Washington to reflect administration goals is yet another.

The most egregious historical example of this was the phenomenon known as Lysenkoism, which emerged in the Soviet Union in the late 1920s. Trofim Lysenko was a Soviet agronomist and biologist who did not believe that genes or DNA existed. Amongst other things, Lysenko argued that in crop plants such as wheat environmental influences are heritable via all cells of the organism.

Lysenko's views were embraced by the Soviet authorities because they fitted with the ideology of Communism. They were likewise adopted in Communist China for similar reasons. This allowed Lysenko to engage in a campaign to suppress his scientific opponents and led to 3,000 mainstream biologists in Russia being fired or sent to prison, and some even executed. Widespread adoption of Lysenkoism also caused crop failures and extreme food shortages. Wikipedia estimates that as a result 30 million people died of starvation.

Worryingly, Lysenkoism appears to be making a comeback amongst fringe groups in Russia today, due I think to a misunderstanding of epigenetics, but also because of Russians' abiding distrust of Western science and a resurgence of Russian nationalism.

In China meanwhile, universities are being told to delete references to *academic freedom* from their charters and replace them with a requirement to promote the "thoughts" of the general secretary of the Communist Party China Xi Jinping.

And following the introduction of Hong Kong's new National Security Law there is considerable concern on the island about the way the law has criminalised what it describes as "secession, subversion, terrorism and collusion with foreign forces". Amongst other things, this is expected to stifle interaction between Hong Kong and overseas academics, as well as many other forms of international exchange.

A week after the law was passed, pro-democracy activist Benny Tai was fired from his tenured position as an associate professor of law at the University of Hong Kong (HKU). His arrest, said Tai, signalled, "the end of *academic freedom*" in the Chinese-ruled territory.[120]

In August, the *Wall Street Journal* reported that the new law is also impacting elite universities in the West, including Harvard and Princeton. (See also). The same impact is being felt at universities in the UK, including at Oxford University.

As I see it, this is at heart an issue of **belief vs. evidence**. In the worst-case scenario, we could see the world drift back to the closed mindset that existed prior to the scientific revolution, a world in which authority, ideology, religion, power and opinion take precedence over observable facts.[121] [122]

A question of trust

Q: If scientists are perceived as less trustworthy in certain political climates, does open access to research change anything?

A: One would certainly hope that open access would help educate the public about science and scholarship and, in doing so, reduce the amount of misinformation circulating in society. After all, one of the oft-repeated claims of the OA movement is that making research freely available will inform the public, and so presumably help reduce the level of ignorance, prejudice and faulty thinking amongst citizens.

But if scientists are no longer trusted then providing free access to their works might not have much, if any, impact (even if the underlying scientific data behind their research is made publicly available) – especially if it challenges or contradicts the beliefs, ideology and/or partialities of citizens.

The core issue here, as you indicate, is public trust and – for whatever reason – trust between the research community and the public is not what it was. A global survey published by the Wellcome Trust in 2019 found that, on average, only 18% of people around the world say that they have a high level of trust in scientists. I suspect any decline is related to the rise in populism we have seen. The pandemic may also end up reducing public trust – for reasons I discuss below.

Will making research on the benefits of vaccination freely available change the minds of antivaxxers? Will making research about the environment and climate change open access alter the thinking of climate change deniers? Personally, I doubt it. As this article concludes, "science skepticism cannot simply be remedied by increasing people's knowledge about science."[123]

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[120] See also.

[121] For an argument on how this might occur see the book *Cynical Theories* by Helen Pluckrose & James Lindsay. Interestingly, they argue that the current trend we are seeing for a rejection of reason and science has its roots in academia and postmodern studies but then spilt over into society at large. One characteristic of postmodernism, the book argues, is that it is sceptical of science, or any metanarrative that claims to a "truth".

[122] As the quote in this article puts it, "Over the last twenty years or so we have seen growth in the idea that science is just a belief like any other. This is very dangerous."

[123] See also this article.

Whether COVID-19 will increase the standing of scientists or lead to further scepticism remains to be seen. An editorial published in *Science* at the start of the pandemic said this: "If science can deliver answers, public trust in science could increase substantially (the high point for trust in science in the United States was at the end of World War II). But if the scientific community contributes to building up hope in the fight against COVID-19, but then does not deliver, the consequences for science could be dire."

Two issues that the *Science* editorial did not address are the negative consequences of a lack of agreement amongst scientists and the likely repercussions when scientists and politicians disagree over how to respond to major health dangers. When new threats like COVID-19 emerge, for instance, scientists inevitably give contradictory explanations and advice, not least because it takes time to reach a consensus on the problems and risks that the threat poses, and how to combat them. Faced with this uncertainty and lack of agreement Nick Hillman, director of the UK's Higher Education Policy Institute, has pointed out, people tend to agree with those whose explanations "chime with their own pre-existing thoughts." This, he added, "seems to be the opposite of being led by expertise."[124]

Above all, trust in science is eroded if the research community is seen to be publicly fighting over what the problem is and what needs to be done. In the case of a new virus, for instance, there is likely to be disagreement over how many people might or might not get infected; how many people might be asymptomatic; what medication might help; whether using face masks helps; when and how a lockdown should be imposed; what other precautions should be taken; how long the pandemic is likely to last; what its long-term medical, social and economic effects are likely to be etc. etc.

And when advice given by scientists subsequently turns out to be wrong and/or scientists are seen to be in disagreement with politicians over what to do the negative impact can be even greater – not least because it creates confusion and suspicion rather than trust. A STAT and Harris Poll survey undertaken in August found that 78% percent of Americans were worried the COVID-19 vaccine approval process was being driven more by politics than science. This issue was explored in the UK context in the BBC radio shows *More or Less* and "Led by the science".

That there has been so much misinformation about COVID-19 swilling around the internet has clearly not helped. Unfortunately, this misinformation has come not just from conspiracy theorists, cranks and fraudsters, but from scientists posting erroneous, premature, self-aggrandising and opportunistic research papers on preprint servers, presumably in the hope of being seen to be in the vanguard of the battle against the virus.[125]

Equally disappointing, some journals responded to the crisis by rushing peer review and failing to make adequate checks about the quality and provenance of the data underlying the research they published. As the authors of a letter published in *The European Journal of Clinical Investigation* in April complained: "Many articles [about COVID-19] are being hastily and non-critically published, contain repetitive or inaccurate information, illogical and non-evidence-based recommendations, and are highly biased."

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[124] The real problem, of course, is that the experts cannot agree (see this for instance. See also the resistance of some governments to following WHO advice.

[125] See also this.

This too appears to have been motivated by a desire of journals and their editors to be seen to be on the bleeding edge. Unsurprisingly, it has led to a number of high-profile retractions, and these have come at a cost to the reputations of some of the most prestigious journals and scientists.[126]

After reviewing the COVID-19-associated publications on PubMed and the Retraction Watch Database a study published in June in *Accountability in Research* concluded that the retraction record appearance rate for COVID-19-related research is "exceptionally high compared to other related research topics in viral epidemics/pandemics and surpasses the basal level of about 4 in 10,000 papers."[127] [128]

And a STAT article argued that the pandemic had led to a "huge amount of wasted effort and wasted energy when actually a bit of coordination and collaboration could go a long way and answer a few questions."[129]

The problems and dangers are that much greater because the public does not generally appreciate or understand that scientific knowledge is essentially a collection of hypotheses yet to be disproven. This not only means that when new health threats emerge there will be a period of uncertainty but there are inevitably times when scientific understanding may have to go through a radical process of self-correction.[130]

As an example of how public misconception about the way science works may be problematic, we could highlight a paper published in *Nature* in January that refuted the consensus view that tropical fish living in coral reefs are adversely affected by ocean acidification. The authors concluded that this is not supported by the data. If when other scientists test the authors' data they have to agree with the paper's conclusions, the scientific consensus will have to be adjusted to fit the new information.[131]

Unfortunately, since scientists maintain that ocean acidification is a consequence of climate change the *Nature* paper could end up strengthening sceptics' assertion that climate change is not the problem many claim it to be. Of course, this is faulty thinking, but because many members of the public do not understand how scientific ideas and theories evolve and change, they tend to view things in a black and white unsubtle way.

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[126] James Heathers, a research scientist at Northeastern University, describes this as a "gold rush for attention".

[127] Retraction Watch is keeping an updated list of COVID-19 retractions here. The scale of the retractions has been challenged by the founder of Retraction Watch here (behind a paywall).

[128] There is a belief that publishers are not learning from their mistakes here.

[129] The article adds, "the analysis found many of the studies are so small – 39% are enrolling or plan to enrol fewer than 100 patients – that they are unlikely to yield clear results. About 38% of the studies have not actually begun enrolling patients.

[130] As the *Guardian* put it recently, "Progress always involves making mistakes and then recognising them. That is because we are all struggling to understand why and how things are the way they are … In every century and every science there are brilliant blunders. The trick is to learn from them."

[131] Note also that a paper published in October challenged a 75-year-old theory about reptile evolution called adaptive radiation.

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In addition, sceptics with a cause are more than happy to exploit any doubts or apparent contradictions in the evidence base to shoot down the arguments of those they disagree with.[132]

What is particularly worrying today is that many researchers also seem inclined to behave as if science and its findings were binary. This can see them insisting that their research and conclusions are incontrovertibly right, and that the research and views of those who disagree with them are incontrovertibly wrong.[133] In the context of the pandemic, this has seen some scientists insisting that governments and wider society should do what *they* say, and that any colleagues who disagree with them should be ignored.

In March, the well-respected physician-scientist John Ioannidis published an editorial entitled "A fiasco in the making? As the coronavirus pandemic takes hold, we are making decisions without reliable data". Others quickly challenged his assertion, including PLOS blogger Hilda Bastian and epidemiologist Marc Lipsitch, who both insisted that while we may not have all the answers we know enough to act decisively against COVID-19.

Subsequently, Ioannidis and his co-authors posted a preprint arguing that the fatality rate of COVID-19 was far lower than other experts had estimated. Specifically, the paper said that the prevalence of COVID-19 antibodies in Santa Clara County indicated that the infection "may be much more widespread than indicated by the number of confirmed cases." This, the paper reported, was "50-85-fold larger than the number of cases currently detected", suggesting that the fatality rates due to the coronavirus were much lower than previously thought.[134]

This time the pushback was much more robust and very public. *Undark* reported that the Ioannidis paper, "quickly came under criticism from other researchers, who eviscerated its methods on Twitter and in an online forum."

Some scientists even called for Ioannidis and his co-authors to apologise for wasting everyone's time. And we saw assertions that the paper had been funded by a private investor who wanted the lockdowns to end.[135]

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[132] Indeed, they are not shy of using death threats too, or posting negative reviews from fake patients on the sites of doctors who are trying counter the false propaganda posted by antivaxxers and other "deniers".

[133] It has been suggested that it has always been thus. As a *Nature* article puts it, scientists are "far from being engaged in a disinterested activity, scientists are in the business of persuasion. They write narratives to convince colleagues of their claims, or to overthrow conventional wisdom. Evidence becomes a rhetorical device: scientists might torture their data to say the right things, fail to mention evidence that contradicts their claims or add circuitous arguments that spin their evidence. Put more positively, evidence is credible only when embedded in a persuasive story. It does not speak for itself." But if that is correct the world of social media has undoubtedly reinforced and exaggerated such tendencies.

[134] One of the scientific challenges with COVID-19 is that there appears to be a large number of asymptomatic cases. This makes it very hard to know how prevalent the virus is in a community.

[135] In mid-May Buzzfeed reported that an anonymous whistle-blower had claimed that the study was funded in part by David Neeleman, the JetBlue Airways founder and a vocal proponent of the idea that the pandemic isn't deadly enough to justify continued lockdowns. Ioannidis told Buzzfeed he was not personally aware of Neeleman funding the study. "I don't know exactly who were the people who funded the study eventually. But whoever they were, none of them really told us it should be designed in a given way or done in a given way or find a particular type of result or report a particular type of result." It is hard not to conclude that the problems scholarly communication faces are far bigger than open vs. closed. Incidents like this might also lead us to be somewhat concerned about the dangers of preprints.

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Following the criticism, Ioannidis and his co-authors posted an updated version of the paper in which their conclusions were toned down and more detail was given about the process and analysis that had been done. It also addressed at length many of the critiques the authors had received.

In another case we saw a group of scientists publish an open letter demanding that PNAS retract a paper about face masks. They also too took to Twitter to post what Buzzfeed called "eviscerating critiques of its assumptions and methods".[136]

While reaching scientific consensus inevitably requires a to-and-fro discussion, when that takes place in an uncivil and sometimes exaggerated and inaccurate way, and discourteous exchanges take place in full public view on social media, I think we need to worry that scientists are being sucked into the social media's black and white world of entirely right or entirely wrong. And we have seen disagreement over COVID-19 grow over time with often two opposing groups at loggerheads over what to do. In October, for instance, the Great Barrington Declaration was published which argued against the use of lockdowns (See also). This quickly attracted a competing petition in the shape of the John Snow Memorandum.

We should surely be concerned when scientists make overconfident claims about their research and are too quick to reach unjustified conclusions, often on too little data. The truth surely is that despite a mountain of papers and opinions having been published about COVID-19 not enough[137] was and is known about the virus for any researcher to go around eviscerating other researchers on Twitter because they disagree with a paper's conclusions?

Doubtless many of the papers that attracted these eviscerations did fall short in some way (as so many research papers do today), but public insults and social media attacks are not going to enlighten laypeople. They are more likely to feed conspiracy theories, paranoia and misinformation campaigns, and to further lower trust in science.

Subsequently, Ioannidis posted another paper (on the website of the International Institute of Forecasters) entitled "Forecasting for COVID-19 has failed." This time Bastian's response was even more robust. She tweeted: "I'm not going to comment on everything Ioannidis says/writes about Covid-19 (alone or with others) in detail: doing that properly would just about be a full-time job at this point. But this latest made me gasp – literally, gasp – at the audacity of criticizing other Covid-19 forecasters for selective reporting, wrong data inputs &c while (a) not admitting he personally did the same & was more catastrophically wrong than some he's now criticizing & (b) not admitting that some turned out to be pretty much right."

By way of contrast, two scientists wrote an opinion piece in STAT in which they said, "While neither of us shares all of Ioannidis' views on Covid-19, we both believe his voice – and those of other legitimate scientists – is important to consider, even when we ultimately disagree with some of his specific analyses or predictions."[138]

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[136] The article later had a correction attached.

[137] The article notes that "More than 60% of published papers on COVID-19 are opinion pieces not reporting original data."

[138] In this regard, see the opinion piece that Ioannidis published *BMJ* in October: "Scientific petitions and open letters in the covid-19 era."

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That seems a more productive approach to take.

Meanwhile, in Brazil a group of researchers became embroiled in a heated political dispute over a chloroquine study they had undertaken. The temperature of the discussion increased somewhat when the Brazilian president (who has been accused of virus denial) attacked them on Twitter and posted a link to an article in which the scientists were described as "left-wing medical activists."

Whatever one thinks about this kind of behaviour, it is not the way to increase the public's trust in science and scientists, or to fight a virus. It is no surprise, therefore, that the pandemic appears to have reduced public trust in science. And we should worry that the professional scepticism we expect researchers to display appears to be in increasingly short supply.[139]

It is also no surprise that a survey undertaken in August found that only 30% of the UK population said they would definitely take a COVID-19 vaccine and 1 in 8 believe the pandemic is a conspiracy to force people to get vaccinated. And in Sweden a recent survey suggested that 26% of Swedes do not plan to take any of the Covid-19 vaccines being developed, a reluctance based on a bad experience the country had with a vaccine against swine flu developed by GlaxoSmithKline ten years ago. (see also this).

Meanwhile in the US in October, the share of Americans who said they are likely to get a Covid-19 vaccine as soon as it's available was said to be dropping, a decline notably more pronounced among Black Americans.[140] Will these attitudes change with the news that there are now at least three potential vaccines? Can Biden win round US doubters when he takes the helm? We don't know, the jury is still out.

Plan S, transformative agreements

Q: How are open access initiatives like Plan S perceived? As a threat to academic freedom? As a measure against the corporate control of publishing?

A: I think it fair to say that when it was launched Plan S was presented as an initiative that would limit corporate control of scholarly publishing (and help address the problem of *affordability* as a result). Today, many commentators (including me) believe Plan S will *increase* corporate control.

And yes, I believe these kinds of policies are a threat to *academic freedom*. Indeed, when Plan S was first announced a group of researchers launched a petition that made just this complaint. Partly for this reason, and partly in response to push back from publishers, Plan S has (on a number of occasions) been watered down. The risk to *academic freedom* is therefore now not as great as it was, but I believe a threat still exists, as it does with all overly directive mandates.

How has Plan S been watered down? For a start, cOAlition S quickly had to conclude that the initial start date of 2020 was not achievable, so it delayed it until 2021. It has also relaxed the rules on hybrid OA several times. Originally hybrid was outlawed, which would have

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[139] See also this.
[140] See also this.

prevented researchers publishing in around 85% of journals, including influential titles like *Nature* and *Science*.

Faced with opposition over hybrid OA, cOAlition S adopted the concept of the "transformative agreement". This has seen the funders agree to continue to pay for hybrid OA until 2024, on the understanding (or hope) that publishers will transition their journals to open access in that time period.

The Addendum to the cOAlition S Guidance on the Implementation of Plan S published last November says this of hybrid OA and transformative agreements: "A fundamental principle of these transformative arrangements is that they are temporary and transitional:[141] where cOAlition S members provide funding to support publication fees of journals covered by such arrangements, this funding will cease on the 31 December 2024. cOAlition S urges individual researchers, research institutions, other funders, and governments not to financially support 'hybrid' Open Access publishing when such fees are not part of transformative arrangements."

When it became evident that publishers were not willing to include some of their prestigious journals in transformative agreements, and that many societies are not in a position to negotiate such agreements, cOAlition S also adopted the terms "transformative journal" and "transformative model agreement."

And when the initial rules for transformative journals were criticised by Springer Nature, cOAlition S again watered down the plan (dropping the obligation to flip to 100 percent open access by 2024). By this point some commentators were suggesting that the coalition had given into legacy publishers. Hinchliffe, for instance, commented, "The coalition continues to take actions that rehabilitate hybrid journals into compliance rather than taking the hard line of unacceptability originally promulgated."

cOAlition S has, however, continued to insist that hybrid OA is not acceptable, and it has continued to repeat that it will not pay for hybrid OA outside of a transformative arrangement.

The truth is that cOAlition S appears always to have been conflicted over hybrid OA. On one hand it says that hybrid is unacceptable (indeed the initially published principles directly said: "The 'hybrid' model of publishing is not compliant with the above [Plan S] principles". This was later changed).

On the other hand, the Plan S rules allow researchers to publish in both subscription journals and hybrid journals using the green OA model – so long as they pay any hybrid fees out of their own pockets/ budgets, and so long as the paper (the final Version of Record, or Author's Accepted Manuscript) is made immediately available on the internet with a default CC BY

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[141] Nevertheless, it is not at all clear that these deals will trigger an irreversible transformation to open access. As Didier Torny pointed out after reviewing the Springer/DEAL agreement, "If things go south, subscriptions could be back at the very heart of the next agreement."

licence attached (while there is a vague statement suggesting that exceptions on licensing can be requested, its vagueness is not encouraging for those looking for a waiver[142]).[143]

Concerned that not all publishers would allow researchers to comply with their rules when taking the green OA route (and perhaps feeling that they had given too much away), cOAlition S announced in July that – as a condition of receiving a grant from a cOAlition S member – researchers must tell publishers that they are obligated to attach a CC BY licence to their AAMs/VoRs. Referring to this as its Rights Retention Strategy (RRS), cOAlition S evidently hopes it will force publishers to comply with the Plan S requirements and ensure that all cOAlition S-funded papers are made immediately available on a reuse basis, however they are published. As noted, this was already a requirement, but some prestigious journals (e. g. *Science*) have been resisting it.

What will be the implications of the RRS? Will some publishers simply refuse to accept papers from authors funded by cOAlition S? Will large publishers redouble their efforts to convert the world to pay-to-publish gold OA? Will it reignite the green vs. gold debate? Will it further alienate researchers from open access? Will it, as Michael Clarke suggests, accelerate industry consolidation by driving "more society and other independent publishers into the arms of big commercial houses?" Right now, we can only speculate. However, Cambridge University Press (CUP) has said that it "cannot support" the RRS. I expect other publishers may follow suit.

Commentators have argued that as Plan S remains essentially a European initiative and not many funders have signed up to it, its scale and reach are too limited to change the scholarly publishing system in the way cOAlition S hopes. But that could prove a mistaken assumption. A more likely outcome could be that international publishers will respond by flipping most, if not all, their journals to pay-to-publish gold OA, if only to avoid the implications of cOAlition S's Rights Retention Strategy (and similar funder policies). Doing so would also reduce the growing complexity of trying to manage open access in a hybrid environment. Springer Nature, for one, has said publicly that it plans to "transition the vast majority of its Springer Nature-owned English language journals that are not already Open Access, including *Nature* and the Nature Research journals, to become Transformative Journals". (I will discuss this more later).

The fact is that zero embargoes are anathema to most legacy publishers. Faced with increasing threats from funders to outlaw embargoes and make CC BY licences mandatory, many now view pay-to-publish gold OA as the only realistic way of migrating to open access and most (if not all) legacy publishers believe transformative agreements are the best vehicle for doing so. With Plan S due to come into effect in January, therefore, they have been scrambling to sign such agreements with universities like the University of California, with consortia like Projekt DEAL in Germany and VSNU in the Netherlands, and with national negotiating agents like Jisc in the UK.

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[142] Plan S Implementation Guidelines say that CC BY is required by default, but "cOAlition S will, as secondary alternatives, accept the use of the CC BY-SA 4.0 license, and use of the public domain dedication, CC0. cOAlition S members may approve the use of the CC BY-ND license for individual articles, provided that this is explicitly requested and justified by the grantee."
[143] The consultation document put out by UK Research and Innovation in February suggests that the rules could be relaxed further in the UK, with both hybrid OA and licensing now apparently again up for discussion.

At the same time, they have been launching a flood of new pay-to-publish OA journals (and mirror journals).[144]

For their part, many researchers are likely to view the RRS and similar policies as a further attack on their independence and *academic freedom*. Partly for that reason perhaps, days after the RRS was announced the European Research Council (ERC) – an organisation that had supported Plan S from day one (but was never formally a cOAlition S member) – said that it was withdrawing its support for the initiative. It was doing so, it explained, because it believes the policy does not "respect researchers' needs".[145] More specifically, *Chemistry World* reported, the ERC was "concerned by Coalition S's decision to make research published in certain hybrid journals 'non-compliant' from January 2021."

As the Twittersphere pointed out, the latter is not strictly correct. The RRS has, however, surely muddied the waters. In its statement the ERC also said that its decision was informed by the need "to preserve equity among research communities and among European countries, with particular emphasis on countries with more limited national financial support for research."

Presumably, the thinking is that researchers in less affluent countries will be unable to afford APCs and that if we see publishers start to turn down papers unless an APC is paid (as CUP seems to be threatening) they would be disadvantaged (the *equity* problem).

The ERC announcement was described by the architect of Plan S as a "slap in the face".

Elsewhere, in November two Max Planck researchers described transformative agreements as just another version of hybrid OA and "unethical".

Costs, costs, costs

It might be useful at this point to explore in more detail the issue of publishing costs.

As I have suggested, one of the main reasons why the open access movement emerged and grew (certainly so far as librarians are concerned) was because it was widely believed that publishers are greedy price gougers and that OA would force them to lower their prices. In 2011, a *Guardian* article said of the scholarly publishing industry, "What we see here is pure rentier capitalism: monopolising a public resource then charging exorbitant fees to use it. Another term for it is economic parasitism."

But do funders agree that scholarly publishers overcharge for their services? Even if they do agree, are they able to do anything about it?

Initially, cOAlition S appeared bullish about reducing costs and it promised that APC prices would be capped under Plan S. It later rowed back on this and said instead that it would introduce a price transparency framework that would require publishers to provide a breakdown of how their charges are allocated to different parts of the publishing process:

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[144] Elsevier reports that in 2019 it launched 100 new OA journals (and six new subscription journals). And the launches have continued.

[145] In October, 15 biomedical societies signed a echoed the ERC's concerns in a public letter.

what percentage, for instance, covers the cost of different services such as proofreading, copy editing, and organising peer review etc.

As noted in **Footnote 16 on Page 9**, however, cOAlition S has said that this will not be a cost accounting exercise and there will be no auditing of publishers' data. We have therefore to wonder how effective it can be.

Commenting in *the Brief,* Joseph Esposito and Michael Clarke noted: "While framed as 'price transparency,' this is ultimately an exercise in allocation. To produce numbers that align with the categories, publishers either need to allocate costs (a significant undertaking as accounting systems are not designed to allocate costs in this way) and then retrofit a cost-based pricing veneer on a value-based pricing model, or to just make up pricing for *à la carte* services that they will never actually offer *à la carte*."[146]

Why does cOAlition S appear to have retreated on the issue of costs? Has it had to limit its aspirations out of concern that it could be accused of interfering in the market? That presumably is why it has said that data collected as part of the price transparency framework will be shared with funders and research institutions but not with other publishers.[147]

Another possibility is that cOAlition S doesn't actually believe that scholarly publishers overcharge for their services, and that their prices are not therefore unreasonable. At the APE conference in January, Burgelman told delegates that since university budgets devote less than 2% to publishing (on the supply and demand side combined), it is hard to argue that publishing is too expensive.

This figure of 2% (often less) has been regularly cited since Wellcome Trust commissioned a report in 2004 to look at publishing costs. The aim of the report was not so much to assess whether publishers overcharge for their services (although that may have been an implied intention), but to respond to critics' claims that pay-to-publish would be more expensive than the subscription system. The Wellcome report concluded that "an author-pays model offers a viable alternative to subscription journals … at a cost that is significantly less than the traditional model while bringing with it a number of additional benefits." On that basis, Wellcome said it was happy to pay the OA publishing fees for its fundees.

Three years later (2007) Wellcome's Robert Kiley (who was a key player in the founding of cOAlition S) was reported saying that Wellcome Trust expected the costs of paying for its fundees to publish their research open access would be between 1%-2% of the Trust's annual research budget.[148]

When I spoke to Kiley four years later (2011) he told me that Wellcome fundees were then publishing around 5,000 papers a year, and that during a three-month period at the end of

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[146] It is worth noting that F1000Research responded to cOAlition S's price transparency requirements by changing its pricing structure. Amongst other things, this means that its lowest APC band has increased from $150 to $800.

[147] It is not entirely clear how this will work. How will publishers be prevented from gaining access to the data – by word of mouth, for instance? It seems cOAlition S is also puzzling over this: in October it released an RFI to seek help!

[148] As he put it, "If every single one of those papers was published as an open access article, with an average cost of £1,650 [£2,200] per article, the total cost to the Trust would be £6.64 million; just over 1% of our annual research budget".

2010, the Trust had paid for the publication of 440 papers. This led him to conclude that Wellcome would pay around $12 million (£7.3 million) a year in a fully OA world, which was at that time about 1.25% of Wellcome's annual budget.[149]

In speaking to Kiley I cited a 2011 report that had said "if average APCs were set at a level equal to the estimated current global average cost per article (£2,634/$3,465), the UK universities' annual cash costs would rise significantly, leading to a high net cost to the UK relative to the other scenarios." Kiley replied by citing another report in which it was estimated that with an APC of around £1,457 ($2,200) the benefits cost ratio (BCR) was "very substantially positive, in the range 10.8-15.7."

In all these statements there seemed to be no great concern that publishers are price gougers. Rather the aim appeared to be to justify the pay-to-publish model and to argue that it would not be more expensive than the subscriptions system. When I pressed him, Kiley put it this way, "We believe that the benefits of maximising the dissemination of Trust-funded research findings, via our open access policy, outweigh the costs."

Fast forward 4 years (2015) and in a paper published by Germany's Max Planck Digital Library (MPDL) it was stated "All the available evidence that has been published or discussed in various reports points consistently to a predicted APC level of well below EUR 2,000 [$2,353.85] in a purely open access scenario." Given this, the paper concluded, "the transformation to open access can be achieved without any financial risks." I will come back to this paper later but will note here that the aim appeared again to be to demonstrate that OA would be no more expensive than the subscription system. There also appeared to be no real concern that publishers charge exorbitant prices. At worst, MPDL's "fact-based analysis" argued, pricing would be more or less equivalent.

In passing, we could note that more recent Wellcome figures indicate that the average APC in 2018/19 was around £2,410 ($3,116). Separately, Cambridge University reported that in 2018 it was paying an average price of £2,147 [$2,776]. This suggests that OA costs are likely to be more expensive than funders anticipated.

But to repeat, I have formed the opinion that European funders do not view publishers as price gougers. Much of the thrust of their discussions about pricing has been to argue that costs will be no higher in an OA environment. Certainly, I am not aware of any claim from funders that publishers are engaged in "economic parasitism" as *The Guardian* put it.

That said, there have always been concerns about the cost of publishing in hybrid journals and of double dipping during the transition to OA – which is why funders are now so keen to outlaw hybrid OA.

In short, funders have consistently argued (or at least implied) that the costs of pay-to-publish will amount to no more than 1-2% of research budgets and that this is both reasonable and manageable.

Could it be, therefore, that in talking about price caps and transparency, cOAlition S's aim has been to get OA advocates to buy in to Plan S; that it was a way of marketing the initiative

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[149] Of course, if we calculated that 1.25% across all funders, we would be talking a great deal of money, and this would be money that would no longer be available to fund research.

to the open access movement? After listening to Burgelman's presentation at the APE conference Schonfeld concluded, "Europe does not think publishing is too expensive. Europe wants to *protect* its publishing sector by forcing it to innovate towards open." (As I shall later argue, it is important to bear in mind that the world's two largest scholarly publishers are European companies).

Alternatively, perhaps cOAlition S has simply had to conclude that its power to control what publishers charge is limited. Either way, it seems highly unlikely that Plan S and the flood of transformative agreements it has triggered will reduce the costs of scholarly publishing.

It makes sense here to ask: is there any *evidence* to suggest that publishers have routinely overcharged for their services? Puzzling over this question earlier in the year the consultants Delta Think crunched some numbers. Having done so they concluded that the *affordability* problem is not so much a product of publisher greed but a mismatch between rising global publishing output and a slow decline in library budgets over the years. As they put it, "The data suggest that the fundamental problems lie with flat library budgets, which are failing to keep up with increases in spending on R&D in the Higher Education sector."

Delta Think added: "Over the last twenty years, university budgets have almost doubled in real terms, while the proportion spent on libraries has almost halved."

I do not know if Delta Think's figures are accurate. But if they are it might seem to imply that publishers' annual price increases are a justifiable attempt to keep prices in line with the number of papers they are being asked to publish, rather than evidence of rentier capitalism or economic parasitism. Of course, if their prices were unwarrantedly high from the beginning then the annual price rises might more appropriately be viewed as an attempt to maintain them at an excessive level.[150] Either way, in light of Burgelman's comments we might want to doubt that funders are overly concerned about the costs of scholarly publishing.

For their part, OA advocates and librarians clearly remain convinced that publishers are exploitative and many of them worry that Plan S will allow legacy publishers to migrate what they view as exorbitant pricing levels to the OA environment.[151]

Responding to such criticism, cOAlition S Open Access Champion Johan Rooryck has said: "cOAlition S has been faulted for focusing primarily on an accelerated transition towards Open Access by legacy publishers and existing journals. But let us not forget that these existing journals are where the grant holders of the cOAlition S funders want to publish."

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[150] As OA advocates point out, this does not explain why the oligopoly has for many years enjoyed enviably profit margins. Bloomberg's Justin Fox noted in June, "Elsevier had an operating-profit margin of 37% last year, which helps explain the high valuation of its parent company. At Taylor & Francis the operating profit margin was 29%, at Wiley's research publishing arm 27% and at Springer Nature (as reported in the prospectus for a cancelled 2018 initial public offering) 23%. Just for comparison, the 2019 operating margin at famously profitable Google was 26%." Of course, to assume that the top 5 publishers are representative of some 2,000 scholarly publishers might be wrong. Perhaps the real questions are: how were 5 companies allowed to acquire such a large slice of the market and is anyone willing to do anything about it? As I shall argue, we might also want to be concerned that in forcing OA on the research community funders are likely to create worrying new problems.

[151] A recent article in *THE* argues that the problem the research community faces (part of the OA dilemma I will discuss later) is that "Most of the charge levied for making articles open access is driven by the market power of big publishers" and that this "inflates APC", especially with hybrid OA.

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Here again we see a gap between what OA advocates and libraries want and the wishes of the larger research community. However, it might seem that librarians have begun to reach a similar conclusion to Rooryck, since many are now signing transformative agreements. What will surely be encouraging them in this is that they have learned just how difficult and messy the business of managing green OA policies is. While green OA might put pressure on publishers to reduce their prices, the task of establishing when and where faculty have published, negotiating multiple publisher rules over when those papers can be made open access, and then depositing the papers in the institutional repository on behalf of authors has generally proved a nightmare for librarians. By contrast, if they sign a transformative agreement they can outsource the compliance work to publishers, while also avoiding double dipping (they hope), and enabling a faster transition to open access.

Moreover, if a university signs a transformative agreement many publishers are now willing not only to make the paper *immediately* open access on their own platform, but to post a copy in the author's institutional repository too.[152]

The problem, of course, is that libraries don't believe transformative agreements will be any more sustainable than the big deal. "From the library perspective, The big deal is typically seen as no longer sustainable," Lisa Hinchliffe has commented. "One must ask then if transformative and pure publish agreements will also suffer the same fate. In my view, it seems impossible that they will not."

It may also be that librarians have come to hope that if funders routinely start to pay for gold OA some or all of the costs of scholarly communication will be taken off their shoulders and so help to solve **their** *affordability* problem.[153] Unfortunately, this will not solve the wider *affordability* problem since it will reduce the money available to do research. In addition, a lot of research – especially in the humanities – does not receive direct government funding and so there may be no funder to pay the APCs. And since many governments in the Global South may not be in a position to pay APCs it has implications for the *equity* problem.

It might also seem that some OA advocates have themselves become sympathetic to transformative agreements, not least because they can see that they offer a faster route to open access. At the same time, however, like librarians they worry that these agreements will embed legacy publishers and their prices into the OA environment and make pay-to-publish gold OA the norm. But as I noted, many are now inclined to support any initiative likely to make more papers open access, even if it will not achieve the three BOAI goals. Yay to *accessibility*; farewell to *equity*; pity about *affordability.*

In other words, some OA advocates appear to have become so obsessed with seeing the number of articles that are freely available grow that they are willing to turn a blind eye to the *affordability* and *equity* problems. Some may also assume (unrealistically I believe) that these problems can be fixed at a later date. Apart from anything else, there will be the issue of what economists call "path dependence".

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[152] The University of California Declaration of Principles to Transform Scholarly Communication states, "Publishers shall make work by our authors immediately available for harvest or via automatic deposit into our Institutional OA repository or another public archive."

[153] But see Rooryck's comments in **Footnote 219 on Page 80.**

One can get a sense of the conflicted position OA advocates find themselves in by scanning the list of Plan S ambassadors: by agreeing to be an ambassador many long-standing and prominent OA advocates are directly supporting the initiative. Yet many of these same people frequently express concern about the kind of open access that Plan S is leading to.[154] [155] They can also see that this will only serve to strengthen legacy publishers – the very companies that the OA movement wanted to tame or eject from scholarly publishing – while posing an existential threat to native OA publishers and small learned societies, the organisations OA advocates say they want to strengthen and support.[156]

However you look at it, it is hard to see how transformative agreements can loosen the grip that legacy publishers have over scholarly communication, or reduce the costs of publishing. Instead, they and their pricing levels will become locked into the new environment.[157]

And while native OA publishers like Frontiers and MDPI are growing fast, they too use the pay-to-publish model and their prices appear to be growing even faster than those of legacy publishers. Like subscriptions, therefore, APCs can be expected to constantly increase in price. In a recent example it was reported that a third of the journals published by Frontiers in 2019 and 2020 (20 / 61 journals) increased in price by 18% or more (up to 55%).

When justifying their support for Plan S, OA advocates will often argue that compliance is possible by means of green OA. But since Plan S is triggering more and more transformative agreements, and publishers are increasingly converting their journals to pay-to-publish, this may be a misplaced assertion. In any case, green OA itself cannot be viewed as a sustainable long-term strategy since it is parasitic on subscriptions. As I noted earlier, legacy publishers also strongly resist zero embargoes and CC BY licences unless they have been paid an APC (i.e. gold OA). Publishers' objections to green OA will only have become stronger in light of cOAlition S's RRS. If many funders introduce such a strategy, publishers may (like CUP appears to be threatening) refuse to accept papers funded by these organisations unless the authors agree to pay for gold OA.

A further problem with transformative agreements is that – as part of such deals – publishers offer discounted APCs to the institution's authors. Not only does this discriminate against smaller publishers unable to offer transformative agreements but it will – as the authors of a recent *Science* article point out – "influence where researchers opt to publish their work, contravening basic principles of *academic freedom*."

I can only conclude that many OA advocates feel that if we are to see OA become a reality before the *next* 20+ years passes they have no choice but to support initiatives like Plan S, even though they know that they are highly unlikely to adequately address the problems of *affordability* and *equity*.

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[154] One of the Plan S ambassadors is Martin Eve. Last November he wrote a blog post expressing concern about Burgelman's geo-blocking proposal, and bemoaning the growing scientific nationalism and underlying regional exceptionalism it demonstrates.

[155] Eve has also expressed growing concern about the implications transformative agreements will have on *affordability*.

[156] True, we are seeing native open access publishers like PLOS, Frontiers and JMIR also signing large publishing agreements ("pure" open access agreements) in response. These are problematic for many of the same reasons as transformative deals and we don't know how successful they will be over time.

[157] As some OA advocates have acknowledged.

Either way, as noted, it may be that pay-to-publish transformative agreements have gained sufficient traction that the market has begun to take over. As James Milne, the president of ACS Publications (which is hell bent on signing as many transformative agreements as possible), puts it, pay-to-publish and transformative agreements are now viewed as "the direction of travel" for scholarly publishing. In what might seem to support this view, it was announced in October that the Howard Hughes Medical Institute (HHMI), the largest private biomedical research institution in the United States, along with The Templeton World Charity Foundation, are joining Plan S and are prepared to pay their fundees' APC costs. The possibility, therefore, is that cOAlition S will change the whole scholarly publishing system and we will see all international journals flip to pay-to-publish (unless the pandemic changes the direction of travel, a possibility I will explore later).

In any case, with funders and publishers now firmly in the driving seat, OA advocates can do little more than watch helplessly from the side-lines as a*ffordability* and *equity* are sacrificed on the altar of *accessibility*.[158]

However, if Hinchliffe is right to argue that the transformative agreement will be no more sustainable than the big deal, it may prove only a temporary phenomenon, particularly if as a result of the pandemic universities find themselves struggling to afford *either* big deals or transformative agreements.

Puzzling over the likely future for read-and-publish (AKA transformative) agreements earlier this year, the European University Association (EUA) commissioned a survey and report to consider how they might develop. This concluded that such agreements should be viewed as "an intermediary phase on the way to a different scholarly publishing market – not as an endpoint."

The report went on to suggest two possible future scenarios, both of which posit the emergence of a scholarly publishing system based primarily on publishing platforms,[159] either for-profit platforms like F1000Research or community-owned platforms like the Open Library of Humanities. As the report puts it, "it seems that the scholarly publishing market is most likely to move toward OA platforms over the long-term. Whether these are publisher-owned or community-owned may largely depend on the actions of stakeholders in the market (ambition and organising power of the scientific community, for instance)."

It added, however: "For now, the publisher-owned platform scenario is perceived to be most realistic. In this scenario, current journals and their distinguished brands could be maintained. Both publishers and scholarly stakeholders seem to benefit from this scenario. Moving beyond the current journal format will require a departure from the current researcher performance assessment mechanisms of institutions."

How realistic a picture of the future is this? I believe it is a very likely scenario, not least because funders have already started to outsource the publication of their funded research to for-profit publisher platforms like F1000Research. And perhaps mega journals like PLOS ONE, Scientific Reports and Heliyon could be viewed as first generation platforms (although

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[158] Or perhaps they are allowing hope to triumph over experience (not least over the likelihood of continuing price inflation). They also have a misplaced belief that less wealthy researchers are able to obtain APC "waivers". But as this article suggests, such waivers could be viewed as little more than "a charity band-aid on a broken system."

[159] What this might mean in practice is not entirely clear, but I shall suggest a possible migration path later.

they are less innovative than F1000Research). I have to doubt, however, that publishing platforms can any more successfully address the *affordability* or *equity* problems.

On the issue of costs, *The Brief* notes that neither the authors of the EUA report nor those it surveyed acknowledged that the prices European institutions (universities and funders) are currently paying for their transformative deals "are only possible because institutions in the rest of the world continue to pay for subscriptions." If the whole scholarly publishing system were to shift to open access, *The Brief* added, "the costs for research-intensive regions, such as Germany, France, The Netherlands, and elsewhere in Europe, would likely increase. The report implies that, to the contrary, there would be no cost increase in a shift to OA – or that costs would even *go down*."

I think we can also assume that moving to a system based on for-profit publishing platforms – particularly platforms offered by legacy publishers that maintain current journals and distinguished brands – will not change the pricing dynamics. A scholarly publishing system based on for-profit OA publishing platforms would also raise a number of new and worrying issues that go beyond pricing. I will discuss this later.

Unbundling

But first I want to look at another trend we are seeing, one that can surely only serve to further confuse a confusing situation. That is, we are seeing large universities like the University of California (UC) and MIT very publicly cancelling their big deals and walking away from publishers. Others have been cancelling their big deals in favour of signing much smaller *à la carte* subscription deals with publishers.

Neither of these practices are new,[160] but as the power struggle between publishers and librarians intensifies both strategies are attracting a lot of attention right now. What particularly captured people's imagination were the recent decisions by a number of US universities to "unbundle" their big deals with Elsevier and subscribe to a smaller number of hand-picked journals instead. These include UNC Chapel Hill, Iowa State University and the State University of New York (SUNY) – a system of 64 institutions. (It seems Purdue will be the next to unbundle).

Explaining UNC's objectives in unbundling, librarian Nerea Llamas told SPARC that the decision had been informed by "four values": sustainability, *affordability*, transparency and open access. This last value is striking if you consider that those universities unbundling and/or choosing to cancel their big deals do not as a result seem to be progressing the open access agenda, although they are saving a lot of money.

By reducing the number of Elsevier journals it subscribes to from nearly 2,000 to just 395, UNC has slashed its subscription costs by $1 million (from $2.6 to $1.6 million). These savings, explained UNC librarian Elaine Westbrooks, will be used in part "to provide on-demand, free access to the publisher's other journals through interlibrary loans [ILL] and a third-party expedited delivery service." (There is only one token mention of open access in this explanation).

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[160] Big deal cancellations date back to at least 2008. (See also this from 2011). Indeed, it seems that as early as 2004, Harvard cancelled its big deal with Elsevier in favour of a subscribing to individual titles selectively.

In fact, neither ILL nor third-party services are free of charge. In 2015 it was estimated that the cost of using the ILL system is between $8 and $10 per item. And since libraries will want to keep researchers onside when they cancel or unbundle, we might expect expedited services to be preferred. While commercial document delivery services will deliver papers more quickly, they are more expensive than ILL.[161]

When it cancelled its big deal with Elsevier in 2018, Florida State University used Reprints Desk as its document delivery provider. As the university's negotiations team explained to SPARC earlier this year: "Faculty wanted that guarantee that they could receive articles near instantaneously, so we added an expedited article service from Reprints Desk to get articles instantaneously for a fee ($30 per article)."

When I spoke to Chief Operations Officer at Reprints Desk, Scott Ahlberg, he clarified the pricing, saying: "The overall average copyright charge for an article to academic customers is about $30. But since each publisher sets their own rates, and each customer may order what they want, the average for any individual customer may vary from this."

He added: "In addition to the copyright charge there is also a service fee for each article. This can range from under $5 to over $10 depending on the customer's account and the details of what is ordered."

This suggests to me that the average cost of obtaining an article via a document delivery services is probably around $35. These costs could start to add up.

When the Swedish Bibsam consortium walked away from its big deal with Elsevier in 2018 a number of the universities in the consortium signed up to article delivery services. By September 2019 (15 months into cancellation), the estimated spend on alternative access was €40,000 per month (which had grown from €26,000 per month in March), with research-intensive universities paying somewhat more than the others.

Before unbundling, therefore, a university would be advised to try and calculate the likely cost of sourcing the papers that faculty will still need but that will now be behind a paywall. Part of that calculation will include estimating how many of the papers faculty will need may be freely available by other means – because they are open access, for instance, or because the paper is accessible courtesy of a post-termination agreement (PTA) with the publisher. In the latter case, papers may be freely available because when taking out a big deal, libraries often now add a provision to allow continued access to papers that were published prior to the contract being cancelled (or not renewed). All the papers published after the date of cancelation, however, will be behind a paywall, so the number of inaccessible articles will grow over time.[162]

So an important preparatory task to unbundling ought to be to estimate how much a university is likely to have to pay to ensure access to articles in journals that the university no longer has a subscription to (and so are now paywalled) and are not OA. To assist libraries make this calculation, a new service called Unsub has been developed. This helps them

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[161] I am talking about services like Reprints Desk, Subito, Get It Now, RightFind, the Copyright Clearance Center, the British Library and other national libraries.
[162] It is estimated that the number of new articles published each year is around 2 million, with Elsevier publishing 470,000 articles annually in its 2,500 journals.

decide which journals to cancel and which to retain, [explain](#) Unsub founders Heather Piwowar and Jason Priem.[163]

One of those to use Unsub prior to unbundling was SUNY, which [says](#) it has saved $7 million by cancelling its $9 million big deal and [reducing](#) the number of Elsevier journals it subscribes to from 2,200 to 248. Unsub [estimated](#)[164] that 30% of the papers SUNY faculty would be likely to need access to would be open access, [reported](#) *Science* in July, and a further 25% would be freely available thanks to a PTA with Elsevier.[165]

Presumably, the accuracy or otherwise of Unsub's calculation will only become evident over time. Speaking to me in July, Shannon Pritting, Shared Library Services Platform Project Director at SUNY, [said](#) "there was a lot of scepticism about the reliability of Unsub data and modelling in predicting costs post-cancellation".

A key question, therefore, will be how much of SUNY's savings will need to be used to source paywalled articles by other means. Interestingly, Pritting told me he did not know how much SUNY faculty spend on document delivery. When I pressed him, he estimated that the SUNY system had been requesting 100,000 documents a year, of which about 16,250 are supplied via document delivery services. Using these figures, I calculate that this is costing SUNY around $568,750 a year. In addition, some 83,750 items are supplied via ILL, which I calculate will cost SUNY about $670,000. This suggests that the total cost of fulfilling individual article requests within the SUNY system prior to its unbundling decision was around $1.24 million a year.

What we don't know is how much this might increase as the effects of the unbundling unfurl. As such, we don't know how much of the savings SUNY has made will be needed to source individual articles via ILL and document delivery services, although clearly there is a lot of headroom in the case of SUNY. Strikingly, Pritting told me that he is confident cancelling subscriptions will not lead to a rise in the use of such services.

This view is widely-held by librarians and is based on what universities who have cancelled big deals have [self-reported](#). However, a recent [survey](#) undertaken by Primary Research Group suggests that 37% of faculty who are affected by subscription cancelations turn to interlibrary loan as their first choice in replacing content to which they have lost access. In a separate study Primary Research [noted](#), "For research universities, the range of the percentage of times librarians are able to satisfy requests for content from recently cancelled journals is extraordinary with one participant able to satisfy library patron needs only 7.5% of the time, another, 90% of the time."

Clearly the situation is somewhat confused at the moment and will inevitably vary from institution to institution. In fact, Pritting told me, SUNY's decision was "based on the simple equation of whether 2,200 journals was worth the amount we were paying for the Big Deal,

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[163] Libraries pay a subscription fee of $1,000 a year for Unsub (suggesting subscriptions still have a role to play in the library world!).

[164] SUNY Library Senior Strategist Mark McBride [told](#) *The Scholarly Kitchen* "Unsub was instrumental in SUNY's decision-making process that led to us cancelling the 'big deal' with Elsevier. Their efforts resulted in us saving our campuses nearly $7 million."

[165] Unsub's Heather Piwowar [informed me](#) by Twitter that the 25% via backfile is the average over the next 5 years, more than that to start, less than that at the 5 year mark.

and not the fear of what the costs would be for guaranteeing the same type of access to the 2,200 journals as we had when we subscribed to the bundle."

Presumably, other expenses will also need to be factored in when calculating the financial implications of unbundling. SUNY libraries have indicated, for instance, that they will take out further individual subscriptions if they discover it is necessary to do so. We don't know how much of the savings will need to be used for this purpose.

In addition, there will be the management costs associated with operating a document delivery service, particularly if the library offers a mediated service in which the tasks of receiving article requests and then ordering and supplying the document are undertaken by a librarian. To reduce these costs some universities now offer an unmediated service (UNC appears to be one of those). The potential downside here is that members of the university (sometimes even including students) may run up a large bill before the library is aware of it.

"Our service can get expensive if you over-use it," points out Ahlberg. "We aren't an appropriate replacement for a subscription if you think demand will be high. But where demand is too low to justify a subscription, we believe we offer a demonstrably better user experience than the other non-subscription options."

He adds: "The challenge for a library is to make those choices wisely, in terms of which content to acquire through our service, and what user groups will have access and how. We've had libraries open the doors wide and quickly run out of budget, and others that spend probably too much staff time mediating the workflow to control costs. The sweet spot for most seems to be somewhere in the middle."

We might also wonder whether the money that libraries save from unbundling will be available for them to spend on other things (not least OA), or whether university administrators might insist on clawing it back from their budgets. Speaking to me, Pritting said: "The savings from the change from the big deal to an unbundled deal provided campuses with the ability to weather drastic cuts, and many used the savings to help meet the need to quickly cut spending and budgets." Some of the savings SUNY has made would therefore appear to be lost money so far as the libraries are concerned.

Speaking about unbundling at a recent Webinar, Tyler Walters, of Virginia Tech said, "We're all facing budget cuts and some of the savings ought to be used towards that. One mode of access we will use quite regularly will be some form of commercial document delivery system, and that does cost, so some money needs to be set aside for that."

Another consideration is that if more and more universities unbundle then fulfilling article requests by means of ILL will become more difficult over time, perhaps leaving libraries with little choice but to buy all their articles from paid-for document delivery providers – at $30-$40 a time.

It might be worth here comparing the per-article costs charged by third-party providers – circa $35 [£27.90] – with the per-article costs the then CEO of Elsevier cited to UK politicians back in 2004. The big deal, he argued, was seeing the cost per article fall on a constant basis. In 1999, he said, the average per-article cost was £8 [$10.08]. "In 2003 the cost per article download averaged £1.69 [$2.13]. We think this it will go down below a pound."

A more recent [survey of libraries](#) undertaken by Primary Research Group suggested that "The median cost per download for the highest cost 'Big Deal' from the libraries sampled was $15.00."

Of course, the per article costs of big deals are not directly comparable to the costs of document delivery. The comparison is nevertheless interesting. What is also interesting is that while libraries have put a lot of effort into measuring the usage of articles (e.g. by using [COUNTER](#)), only recently have they started calculating the access costs they might incur if they unbundle or cancel (or perhaps I was just not aware of such activity prior to Unsub). Either way, some universities are apparently taking a somewhat haphazard approach to unbundling. One library dean has been [reported](#) saying that their library managed the process in the following way: "[W]e ranked the journals according to our criteria, and then went down the list until we reached what we could spend and that was it."

Unbundling also needs to be considered from the perspective of the larger research community, as an unbundling decision (especially at a large university) could have a negative impact on other institutions. A [paper](#)[166] published earlier this year looking at Virginia's academic library consortium ([VIVA](#)) pointed out that to date studies have focused on near term impacts. The impact over the longer term, the authors noted, could be greater, especially for smaller institutions that rely on their larger peers to supply ILL requests.

The VIVA paper suggested that unbundling could also have a negative impact on the perception of a library's usefulness. "Studies have shown that interlibrary loan often does not increase following journal cancellations, but rather than being good news, this may represent a decrease in perceived library value by researchers."

In addition, the authors added, "As more groups within Virginia and across the country cancel big deals, interlibrary loan turnaround time and costs have the potential to grow."

Those contemplating unbundling will doubtless be following developments at universities who have unbundled with great interest. To help them in this, in March [Ithaka S+R announced](#) an initiative to explore the impact of big deal cancellations on users, strategies for accessing content, and perceptions of the library's role in providing access.

We might also wonder whether those universities cancelling their big deals are doing so because they can no longer afford them, or whether the aim is to pressure publishers into lowering their prices, particularly if they are looking to negotiate a transformative agreement in place of their big deal. For some, cancellation does seem to be part of a bargaining process. When the Swedish Bibsam consortium cancelled its big deal with Elsevier in 2018 it appears to have been a negotiating tactic. After [signing](#) a new (transformative) agreement with Elsevier a year later Bibsam [said](#) that the cancellation had been successful because, "It is highly unlikely that Elsevier would have offered an improved agreement without cancellation." (I wonder if Elsevier would agree with this).

My impression is that this may also have been UC's strategy when it walked away from Elsevier last year. (We recently learned that formal negotiations with the publisher [restarted](#) in October).

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[166] *The Impact of Big Deal Breaks on Library Consortia: An Exploratory Case Study* (paywalled [here](#)).

60 Open access: *"Information wants to be free"*?

Such a strategy might seem to make sense because everyone assumes that the cost of big deals will inevitably fall over time. As Pritting puts it, "It's clear that the value of big deals is declining, so future deals should only be more advantageous. If SUNY does find it more cost effective to enter into another big deal or 're-bundle' what it recently unbundled, future deals should be better than the deal we had, which was based on historical metrics."

Some OA advocates believe libraries should instead be simply cancelling all their subscriptions with legacy publishers and walking away for good (e.g. here). In advocating for this, they argue that there is in fact no longer any *accessibility* problem, since any paper can be freely obtained elsewhere today, not least via ResearchGate or Sci-Hub.

However, both these services are subject to legal action from publishers,[167] and no library would surely want to be seen making licensing decisions based on an assumption that faculty will obtain the paywalled papers they need via illegal services like Sci-Hub. Moreover, the litigation against Sci-Hub is likely to continue and to intensify going forward; and it could eventually succeed. We know that ISPs that link to Sci-Hub are now also being targeted – e.g. last year French ISPs were ordered to block Sci-Hub. And we know that courts are willing to take increasingly broader measures, including dynamic blocking. True, many researchers will simply use a VPN service to get around such blocking, but in some parts of the world VPN costs appear to be prohibitive (see also).

More recently, we have seen heightened concerns about cyber-security in universities, including claims that Sci-Hub is a cyber-security threat. With an eye on these threats, publishers have created a new organisation called Scholarly Networks Security Initiative (SNSI). This has led to claims that publishers aim to get spyware placed on university servers in order, for instance, to monitor researchers' keystrokes and mouse movements to check if, say, bots are harvesting papers. At an SNSI online meeting a security officer at the University of Utah suggested that publishers could offer universities discounts on publisher prices in return for setting up a "risk sharing program" (and, conversely, penalise them for "infractions").[168] Apart from anything else, the potential surveillance implications here might seem to be considerable. SNSI is certainly controversial and after some Twitter exchanges the security officer published a clarification in which he stressed that he had not suggested libraries share data with publishers. Whatever the truth about Sci-Hub being a security risk,[169] and whatever the legal issues, no one can assume that Sci-Hub offers a long-term sustainable solution for accessing paywalled articles.

When speaking to Pritting, I asked if he felt that by unbundling its big deal SUNY was encouraging faculty to use illegal services. He replied, "The proposition that unbundling will lead to more use of illegal access and that this is a problem that the library or libraries should solve isn't one that is fair to libraries. It's not that libraries are seeking to offer less content to their users; they just can't afford increasing prices."

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[167] Although Springer Nature has taken a different approach with ResearchGate and entered into a partnership agreement.

[168] A transcript of the seminar is available here.

[169] Kent Anderson has claimed that this was "a bad-faith effort to distort the words of a university cybersecurity person in order to foment a conspiracy theory about publishers seeking to install spyware on university systems."

He added, "We hope that, instead of illegal services becoming more common, open access and open science becomes more prevalent and shifts the readership models to open access rather than Sci-Hub or models that aren't connected to legitimate organizations."

This, however, invites an important question: how will unbundling help the world transition to open access? If the aim is to persuade publishers to move from a subscription model to an open access model is it not more logical for a university to simply cancel its big deal, let the publisher sweat for a while, and then go back later to negotiate a transformative agreement, as Bibsam appears to have done, and as I suspect UC hopes to do?

When I asked UNC's Westbrooks on Twitter how unbundling would help move the world to open access the answer she gave was not entirely clear to me. The strategy seems to be to focus on advocacy within the university. However, one is bound to point out that despite the OA movement's 20+ years of advocacy most researchers still prefer to publish with legacy publishers,[170] and they will generally only pay an APC if the university or their funder mandates them to do so and/or provides the money to pay for it. And as we have seen, researchers are not particularly motivated to make their papers available in their institutional repository.

We might also wonder how researchers in unbundled universities will react if their access to research starts to degrade. Will it make them more or less sympathetic to the attempts to force open access on the world?

The question as to whether unbundling will aid the OA cause might seem all the more relevant for those university libraries who have never created an OA subvention fund (or subsequently closed it) to help faculty pay APCs. Currently, for instance, SUNY libraries do not operate OA funds. One consequence of this is that they have little idea of what their researchers are paying in the way of OA fees. As Pritting explained to me: "These costs are paid directly by the author or the department, and payment data is not centrally managed."

Again, however, we can estimate the figures. Pritting knows, for instance, how many OA papers SUNY faculty are publishing, and so we can use the real-life costs incurred by Cambridge University[171] to make a rough calculation. Pritting told me that SUNY faculty publish on average 1,361 gold open access articles per year and 565 hybrid open access articles (giving a total of 1,962 papers). Using the Cambridge figures, we can estimate that SUNY authors are incurring annual fees of over $5 million in APCs.

If the costs of OA are deducted from the savings a university can hope to realise from unbundling, and if we assume there will be new costs arising from increased document delivery services, it is not immediately apparent that the overall costs of scholarly publishing are being reduced or that much is being done to resolve the larger *affordability* problem.

Since SUNY libraries do not pay any APC costs, one could argue that SUNY libraries are in effect offloading some of the costs of scholarly publishing onto others, either individual university departments, or perhaps funders. While this might ease library budgets it does not reduce the costs of scholarly communication but redirects some of them. This might seem to

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[170] And as the conversation about open access has become increasingly complicated so librarians are struggling to explain things!

[171] As noted earlier, the average APC price paid in by Cambridge in 2018 was £2,147 ($2,690)

put unbundling in a different light and, as the Virginia authors cited above warn, could see the perceived value of libraries start to wane.

More importantly, if the ultimate goal is to achieve universal open access, is not unbundling likely to prove a distraction? Might it even be a counterproductive strategy?

A blog post published by the Elsevier negotiators at Iowa State after the university unbundled conceded, "Although we anticipated greater progress toward open access in this agreement, we are committed to carrying the discussion forward in 2020." Again, we might want to ask: has not the last 20+ years been sufficient for that?

Elsewhere, in April, Virginia Tech's Publishing Director in the University Libraries Peter Potter said of unbundling: "Few if any librarians would argue that such an agreement is a long-term solution to the problem posed by the big deal. One might even call these 'little deals' because, although they address the immediate problem of escalating costs, they fail to deal with what most would agree is the bigger and more entrenched problem – that of opening access to a growing body of scholarly research that currently sits behind a paywall. In short, they are not transformative."

Also in April, the authors of the annual Periodicals Price Survey noted: "Many libraries are cutting continuing expenditures by cancelling or breaking up journal packages and buying only those titles for which use or demand justifies the price. Others are aggressively renegotiating contracts with publishers to reduce ongoing costs. Still others are turning to Open Access (OA) to freely distribute research outputs to all. Of the multiple OA models that have taken root, none offer a solution for content costs that outpace library budget increases."

What I do not see here is any collective joined-up strategy. This is in contrast to publishers, who seem to have clear goals and coherent strategies for achieving them.

We also need to note that – just because a university cancels its big deal, unbundles, or signs a transformative agreement – does not mean that its faculty stop submitting their papers to subscription journals. And every author who submits in the traditional manner is placing one more paper behind a paywall, which amongst other things might be expected to help keep the value of the big deal stable.

Commenting on the decision by MIT to end its big deal with Elsevier, Esposito noted, "established journals live on the economics of submissions, not of access. What happens if the top 25 research libraries end their Elsevier agreements? What happens then? Do submissions from Yale faculty decline? Does a member of the Yale faculty continue to edit an Elsevier journal that the library doesn't purchase?"

Elsewhere, Head of communications at RELX Paul Abrahams pointed out: "The number of open access pay-to-publish articles is growing fast, but so too is the number of subscription articles."

Researchers' continuing addiction to publishing in prestigious journals, and their apparent indifference to (or even continued ignorance of[172]) open access, combined with the confused mix of strategies being deployed by libraries and funders – signing transformative agreements, walking away from publishers, or signing "little deals" etc. – does not suggest to me we are likely to see a transition to OA anytime soon or an immediate solution to the *accessibility* problem.

In the meantime, it is far from clear that the PAR/transformative agreements being signed in Europe are [delivering](#) on the expectations of those who sign them (see also [here](#), [here](#), [here](#) and [here](#)). One response to this has been for those who signed them to [water down](#) their objectives retrospectively.

In short, it would seem we can expect both pay-to-read and pay-to-publish to continue to coexist into the future, unless Plan S causes most or all journals to flip to open access. Either way, the so-called "[publishing oligopoly](#)" looks set to continue to dominate scholarly publishing.[173]

It is also possible that as the financial implications of the pandemic play out "little deals" – combined with per-article pay-to-read services from document delivery companies – will become as common a strategy as signing a transformative agreement, making the process of publishing increasingly complex (and thus expensive to manage) and taking the world no nearer to universal open access. Indeed, it could see the number of papers going behind paywalls start to climb again.[174] And if in the meantime universities continue to pay publishing fees to make their own papers OA it is hard to see how any of three BOAI goals will be achieved.

In light of the mess that OA seems to have got itself into it is unsurprising that some OA advocates appear tempted to deny that they are part of something called the open access movement.

Strangely unscientific

As I have said, I have over the years become increasingly sceptical about what the open access movement is likely to achieve. And as I have expressed this in my writing I have attracted what seems (to my eyes) some rather unscientific [responses](#) from OA advocates, many of whom appear to have concluded that I am "anti-OA" (which is incorrect). But perhaps it is the nature of advocacy that those who support a movement prefer to have their cause boosted rather than subjected to critical examination, especially when it is being done by an outsider – or a "[boring man with blog](#)", as one of my critics put it. One of the things I am [taken to task](#) for is talking about the OA movement as if it were a homogeneous group of people. I cannot recall ever having said that the movement is homogeneous.[175] However, it is worth examining the claim.

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[172] A [paper](#) published in September looking at the situation in Finland concluded, "the majority of the academic staff seems to be either unaware of open science or unwilling to implement it, due to the fact that incentives and career advancements still support the traditional way of conducting research."

[173] Consider, for instance, the way in which some societies are viewing Elsevier as the best [partner](#) when flipping to open access. See also [this](#).

[174] More on this on **P. 149**.

[175] What I have [complained](#) about it is a) that the internet has a homogenising effect and b) that OA advocates assume the entire research community wants and needs to convert to open access, and to do so in the

One could point out, for instance, that OA advocates themselves used to *present* the movement as a cohesive group with a unified purpose. While this may be less common today, it reminds us that they too are instinctively inclined to want to characterise the movement as homogeneous. Indeed, since the aim of the movement has been to convince the world of the desirability and/or necessity of open access, and to get wide buy-in to their vision, why would they not want to portray the movement as being a unified and cohesive phenomenon?

In reality, of course, OA advocates have spent the last 20+ years arguing ferociously with one another. And as it became apparent that OA was being co-opted and subverted by others it is understandable that some OA advocates began to distance themselves from "the movement". One way of doing that is to push back against suggestions that they are part of a homogeneous group and to criticise anyone who implies as much. Perhaps homogeneity is embraceable when it is viewed as a positive thing, but not when it is viewed as being problematic?

The point is, of course, that it is very hard to talk about open access without implying some homogeneity. After all, how could open access have emerged in the first place if there had been no movement and no overarching vision and purpose amongst open access advocates? The point of the BOAI declaration after all was to articulate a common set of shared values and goals. Open access certainly did not emerge spontaneously, by means of some organic process;[176] and publishers were certainly not pushing for open access in the beginning – they were actively fighting it.

Clearly, however, it is problematic if disagreement becomes the defining feature of a movement. Today one might be tempted to suggest that the only thing OA advocates can agree on is that making all research open access is highly desirable and that OA is an unmitigated good. I would argue, however, that we can also say that all OA advocates support the BOAI goals. This too might seem to imply some homogeneity of purpose.

The truth is that life is complicated. The OA movement is both heterogeneous and homogeneous. So, while I may speak of "OA advocates" as if they were a homogeneous group, I also frequently point out that there is little consensus within the movement and that this is problematic.[177] [178] (Indeed, that is the thrust of much of what I have to say in this document).

(homogeneous) way prescribed by them. I also worry about the homogenising way in which the publishing oligopoly is eroding bibliodiversity.

[176] If that were the case, of course, we would not have seen open access mandates being imposed on researchers, and OA advocates would not have had to engage in so much advocacy and lobbying.

[177] I first raised this issue in 2003. Subsequently, in 2006, I suggested that an Open Access Foundation be created to prevent OA being co-opted by publishers. As I put it, "OA advocates have failed to claim ownership of their own movement; and they have failed to do so out of fear that they might unleash a wave of self-destructive infighting (as if infighting didn't already take place). But unless they do so soon, they risk the greater danger that opponents and foot-draggers will appropriate the movement, and emasculate it in the process."

[178] As I say, life is complicated. There are some, like Peter Suber, who have long talked of the need for a Big Tent approach. This, however, has created its own problems, not least a longstanding unwillingness to create the official OA organisation I proposed. We could note that Christian Fuchs, the editor of the journal *tripleC: Communication, Capitalism and Critique* (the publisher is a member of the Radical Open Access Collective), has described Suber's views on open access as "libertarian".

In short, however heterogeneous OA advocates may be as individuals, or as factions, it is hard to deny that there is such a thing as "the OA movement" or that there is a common purpose. I think we can also say that many (if not most, or all) OA advocates believe that there is such a thing as "true open access"[179] and that there is a state of being "*truly* open", even if they disagree over exactly what that might mean.[180] One is tempted to conclude that OA advocates want a homogenised world of (their version of) open access, but not any other version. Perhaps we can describe the OA movement as a heterogeneous group of people all seeking to impose their own form of homogeneity on everyone else!

What has become painfully eclear is that the movement is no longer in control of how open access develops (about which I will say more below). One could therefore argue that most (if not all) factions and flavours of the movement (and the individuals that make up these factions) face the same (homogeneous) dilemma: they started a hare running over which they now have little or no control. The analogy that comes to my mind is the recent history of the UK Labour Party, which for the past ten years has been so riven with factionalism[181] that it has failed to be elected. As a result, it has had little power to control events over the last decade. OA advocates face the same dilemma.

Frustratingly, consensus is no closer today than it ever was. Consider, for instance, that in April two new (but unrelated) OA initiatives were launched within days of one another (A Call for Action and Plan A). It quickly became apparent (click "next message" and "previous message" to read through this exchange on the GOAL mailing list to see why I say this) that these two groups are not only focused on different *means*, but may even have different *ends* in mind (see also here).[182]

Tellingly, both the research community and the larger OA movement greeted these initiatives with indifference, suggesting that a degree of OA fatigue has set in. Funders also appear to have ignored them, I assume because they now view themselves as the caretakers of, and prime movers in, open access, not OA advocates or the wider research community.

Whatever the reason, neither of the two new initiatives seem to have attracted much mindshare. Indeed, at the time of writing (some eight months after its launch) Plan A, had only two or three more signatories than it had on launch – giving it an ignominious total of seven organisations and 13 individuals who support it.[183]

But how did OA advocates lose control of their own movement?

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[179] Last time I tried, a search on the term "true open access" on Google I received about 468,000 results.

[180] It does not help that there is no official OA body, as I pointed out in 2003.

[181] Factionalism, it seems, that has not gone away with a new leader, not least by his suspending the former Labour leader from the Party and then denying him the Labour whip.

[182] Glenn Hampson, the founder of the Open Scholarship Initiative (OSI), and organiser of Plan A, has for several years now sought through OSI to bring all the disparate OA voices who take an interest in open access together, including publishers, librarians and OA advocates – in the belief that a unified voice and approach is possible. During the GOAL conversation cited above Kathleen Shearer said, "You will never get everyone in the world to agree about anything. There are still people who don't agree that climate change is real. But that should not stop us from doing what is right and is now, so obviously, a moral imperative. I'm not going to get into a protracted discussion about whether open access is worthy goal, because for me, I know that it is."

[183] The Open Scholarship Initiative does say that one of its partners is UNESCO. I am not sure that there is any formal relationship but OSI has had funding from UNESCO in the past.

66 Open access: *"Information wants to be free"*?

The unexamined life: neoliberal capture

Socrates famously said "The unexamined life is not worth living." I think the same can be said of movements, and I would argue that a consistent problem with the OA movement has been a failure to be sufficiently analytical and self-critical. This is partly a result of it having succumbed to the true believer effect, which I guess is a common failing of movements.

It may also explain why there has been a consistent lack of joined up thinking, or indeed any serious or sustained attempt to provide an adequate intellectual framework to support the rationale for open access. This is a point made by the authors of a recent book called "Open Access in Theory and Practice". The authors conclude that to this day there remains a striking gap between theory and practice in the OA movement, with a particular deficit of the former. As they put it, "What is clear is that principles supporting OA are often used rhetorically without much explanation of their bases …It is clear from our research that many of its advocates and implementers prioritise 'doing stuff' rather than building theoretical justifications for their actions."[184]

This goes to my earlier point that the movement has repeatedly failed to keep the *ends* of open access in mind when proposing different *means* for achieving it. In arguing that there has been a notable failure to articulate a theoretical basis for open access, however, I think this book goes further.

I believe it is their obsession with "doing stuff" that is partly responsible for OA advocates losing control of their own movement. That said, there have been some attempts to question the way that funders and publishers have set about "doing stuff". In 2015, for instance, the Radical Open Access Collective was formed to "provide a "radical 'alternative' to the conservative versions of open access that are currently being put forward by commercially-oriented presses, funders and policy makers."

Perhaps unsurprisingly, the pushback comes more often from those in the humanities and social sciences. This is partly because attempts to force an OA template developed for STEM disciplines onto HSS has drawn attention to many of the weaknesses of the OA movement – not least its assumption that one size fits all.

My suspicion, however, is that this pushback came too late in the day. By the time the radical movement emerged, for instance, funders and publishers had got the bit well between their teeth and were already busy retrofitting open access for the needs of neoliberalism. Moreover, critics have struggled to get a hearing from decision makers, and dissidents like the Radical Open Access Collective seem, in the main, to have found themselves in a position of trying to shut the stable door after the horse has bolted.

How and why did OA get captured? I trace this back to 2012, when a group of OA advocates converted the then UK Minister of State for Universities and Science David Willetts to the cause. Having been persuaded that open access was "a good thing", and keen to position the UK as a leader in what Willetts anticipated would become a widespread trend, he commissioned Dame Janet Finch to produce what became known as the Finch Report. In

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[184] This book, by the way, uses the term "OA advocate" 16 times and OA movement 7 times.

doing so Willetts did not ask Finch to consider the desirability or feasibility of OA, but simply to come up with a strategy for implementing it.[185]

Importantly, Willetts appears to have viewed OA primarily as a tool to allow UK companies monetise academic research, and by doing so to boost the UK economy. He evidently also concluded that this would require cajoling/persuading legacy publishers to develop new business models to ensure research was made open access. His motivations and expectations were outlined in a speech he gave in 2012, in which he described the UK research base as "one of our greatest economic assets", and quoted the US Committee on Economic Development as saying that "the costs involved [from introducing OA initiatives] are outweighed by the economic benefits derived from greater utilisation of research".

In explaining his conversion to OA Willetts said he had also been influenced by a book he had read[186] in which the author argued that the industrial revolution had been driven by "a rich network of learned societies [and] publications, [and] a lively literary life." He added, "I see that underlying argument as applying to open access today in just the same way." (Critics later suggested that Willetts should not have based such an important policy decision [introducing a gold open-access policy] on his "summer reading list").

True, Willetts did also say that the UK research base "enriches us in deeper ways. It enriches our cultural life to have such a range of intellectual activity here".[187] But it seems to me that it was the economic benefits that Willetts anticipated open access would provide that was key for him. In short, he seems to have viewed open access through the lens of neoliberalism.

That the UK set off down the "gold road" to open access was surely in part because the Finch committee was top heavy in publishers keen to preserve their profits. When the report was published, therefore, it recommended (for the first time) that pay-to-publish gold OA be the preferred strategy.[188] [189]

Willetts immediately accepted Finch's "excellent report" and all but one of its recommendations[190] and the report went on to become highly influential, both in Europe and beyond. It was at this point I think we can say that power and control over the OA movement passed from OA advocates to publishers, funders and governments.

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[185] As Dame Janet Finch explained in her report, "We were charged with recommending how to develop a model, which would be both effective and sustainable over time, for expanding access to the published findings of research."

[186] Namely, a book entitled, *The Gifts of Athena: Historical Origins of the Knowledge Economy* (2002) by Joel Mokyr, professor of economics and history at Northwestern University in the US.

[187] He also cited his own experience of being an independent scholar faced by paywalls.

[188] The first recommendation stated, "a clear policy direction should be set towards support for publication in open access or hybrid journals, funded by APCs, as the main vehicle for the publication of research, especially when it is publicly funded."

[189] True, in 2009 the EU had funded the "Study of open access publishing" (SOAP), which by it very title was viewed as prejudicial by OA advocates, since it implies gold rather than green OA. OA advocates were also concerned about the involvement of publishers in the study (see here and here). And it is worth noting the involvement of the Max Planck Society, suggesting that that organisation was committed to gold rather than green OA from the beginning (of which more later).

[190] Willetts rejected a recommendation that VAT not be charged on electronic journals on the basis that EU rules did not allow him to do so. As Willetts put it, "Reference was made to the issue of VAT being applied to e-journals but not printed books and journals. Consideration has been given to this, but, in consultation with Treasury it has become evident that current VAT rules agreed at EU level preclude a reduced or zero rate."

As with OA advocates, Willetts' adoption of the open access cause appears to have been more faith-based than evidence-based. We later learned that the UK OA policy he introduced was ultimately decided not on an analysis of the potential economic and social benefits of open access, or indeed of the best way to implement it, but on the "likely cost of the various options to the Exchequer."

Needless to say, the Finch report's recommendations where not what OA advocates had anticipated and most responded to the policy that emerged from it with some dismay. UK politicians were also disappointed,[191] not least because it upended the existing green OA policy in the UK, which had emerged from a 2004 Select Committee report[192] that had led to hundreds of institutional repositories being created whose purpose and role Finch had put in question.

Following pushback, green OA was brought back into the mix, but the country was by now firmly striding down the golden road – not least because Research Councils UK (RCUK) had been instructed to pay universities large annual grants to cover the costs of pay-to-publish gold OA.

In 2013, Willetts persuaded the G8 to sign a joint statement committed to collaborating "on global challenges, global research infrastructure, open scientific research data, and increasing access to the peer-reviewed, published results of scientific research."[193]

Willetts also invited European Commission representatives to visit him to discuss open access. Soon, mainland Europe was also marching down the yellow brick road. In 2013, the Dutch State Secretary for Education, Culture and Science Sander Dekker committed the Netherlands to making all its publicly funded research articles available free of charge by 2024. In announcing his decision Dekker said: "The current ambiguity needs to cease, and clear rules need to be laid out". What was needed, he added, was to take the "golden road", which means "that authors will pay for the publication of their scientific articles which will then become available for free. This as opposed to the 'green road' which leaves the current system of paid subscriptions to scientific journals mostly intact and also creates an Open Access channel of publication."

Meanwhile, Jean-Claude Burgelman was advocating for a Europe-wide policy on open science from within the EU's Directorate-General for Research and Innovation, where he was head of Research and Innovation Strategy Development.

These various government and funder streams came together in Europe in 2016 (during the Netherlands presidency of the EU), when Dekker helped push through a new EU principle

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[191] As a Committee of UK politicians noted, "almost without exception, our evidence has pointed to gaps in both the qualitative and quantitative evidence underpinning the Finch Report's conclusions and recommendations, most significantly a failure to examine the UK's Green mandates and their efficacy."

[192] One of the 2004 report's recommendations was, "We recommend that the Research Councils and other Government funders mandate their funded researchers to deposit a copy of all their articles in their institution's repository within one month of publication or a reasonable period to be agreed following publication, as a condition of their research grant."

[193] Note there is no real concern here about *affordability* or *equity*, just *accessibility*. E.g. "We endorse the principle that increasing access to the peer-reviewed, published results of publicly funded published research will accelerate research, drive innovation, and benefit the economy."

that "all scientific articles in Europe must be freely accessible as of 2020". This was dubbed The Amsterdam Call to Action, and we can see a direct line to this from Willetts, through Finch, Dekker, the EC Directorate-General, and onwards to Plan S.

In a recent interview, Burgelman said, "The EU open science policy was not top-down. We did not invent it; we took what was living in the community and aggregated and retranslated it." I do not know what "retranslated" means here, but I think I can guess.

Another important moment came in 2015, when the Berlin 12 Conference – an event held each year to follow up on a sister initiative to the BOAI (the 2003 Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities[194] [195]) – was made invitation only. As a result, high-profile OA advocates like BOAI co-signatory Stevan Harnad (who in 1994 had pioneered the idea of green OA when he posted his Subversive Proposal) were unable to attend.

Berlin 12 was organised by the Hamburg-based Max Planck Digital Library, and MPDL used the occasion to launch a new initiative called OA2020. The aim was to promote MPDL's vision of open access – which appears to have always been focused on gold rather than green OA, and about which I will say more later.

In the US, meanwhile, the government has remained focussed on green OA, or what the US National Institutes of Health (NIH) refers to as "public access". Over time, however, many US universities have become increasingly enamoured with pay-to-publish gold OA, both for the reasons given earlier but also because OA advocates had begun to insist that green OA is not "true open access" since it rarely allows immediate OA with a CC BY licence attached. This saw many US university libraries creating OA subvention funds to pay APCs for their faculty. More recently, however, there seems to be more interest in signing transformative agreements.

As I have suggested, a likely outcome of the increasing preference for pay-to-publish gold OA is that most if not all international subscription journals might convert all their journals to pay-to-publish OA – something that Springer Nature has already committed to. In October, we also saw Cambridge University Press announce that it now supports Plan S's transformative journals plan (see also) and the *BMJ* has said that it will apply for the majority of its hybrid journals to receive transformative journal status. If other legacy publishers follow suit, the only option available to researchers who want to publish in international journals may soon be pay-to-publish.

As the implications of what was happening became evident to the wider research community some began to express alarm and concern, particularly historians and other humanists. In 2013, for instance, Professor of Ancient History at the University of Cambridge, and a Fellow of the British Academy, Robin Osborne questioned one of the basic premises of the OA movement – the notion that research funded by the taxpayer should be freely available to all.

And in 2018 historian Philip Mirowski complained that open access and open science were part of an undesirable neoliberal agenda to "re-engineer science along the lines of platform

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[194] Organised by Max Planck in 2003.
[195] There were three seminal OA declarations: BOAI, the Max Planck declaration and the Bethesda Statement on Open Access Publishing of 2003.

capitalism, under the misleading banner of opening up science to the masses."[196] The end result, he said, would be, "One Platform to Rule Them All".

Elsewhere, Mirowski asked a question that far too few OA advocates appear to have given sufficient thought to. As he put it, "if 'openness' is the solution, what is the problem it is supposed to fix?"

Even long-standing OA advocates had by now began to have doubts, particularly over the implications that open access policies cooked in the Global North will have for the Global South. In 2017, for instance, BOAI co-signatory Leslie Chan said he was worried that OA would not be beneficial in the way he had expected. As he put it, "One of my confessions is that I have been giving a lot of advice around Open Access that has turned out to be bad. My intention has always been good, but it's only now that the nuances and repercussions of certain models have become apparent."

He added: "There is still too much emphasis on the access of information and not enough understanding of the power structures and dynamics of control."

Unlike Harnad, Chan did not give up and walk away but (with others) put together the Open Science Manifesto. This contains 7 principles and has a strong focus on the needs of the Global South. Today, Chan is a leading critic of the way in which the Global North is implementing open access and repeatedly warns of the negative consequences this will have for researchers in the Global South.

Others also critical of the implications that "European open access" will have for the Global South include Florence Piron, Dominque Babini and Arianna Becerril-García. And as concern has grown over the homogenising effect that the oligopoly is having on scholarly publishing – with more and more research published by fewer and fewer publishers and papers increasingly having to be published in English – we have seen calls for greater bibliodiversity. Apart from the obvious inequity of this lack of bibliodiversity, it means that researchers in the Global South are having to publish in a second language. As a result they face additional costs on top of any APC that might be levied when they publish in an international journal.

The urgency of the calls for greater *equity* has grown as it has become more and more apparent that the power of the oligopoly is likely only to increase in an open access environment. Unfortunately, getting the voices of those on the epistemic periphery into discussions about open access is extremely difficult. Even when their opinions are sought, they are not really listened to. Having their needs taken into consideration will likely remain a continuing and (I suspect) ultimately unsuccessful task.

For some, the pandemic has foregrounded concerns not just about the neoliberal turn that open access has taken but the implications of OA's technophiliac tendencies. The obsession with openness and technological solutions, combined with the capitalist objectives now embedded into open access, they fear, could have undesirable ethical consequences. As Benjamin Capps recently complained: "The current Open Science (OS) narrative potentially

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[196] He also says, "The irony of the situation is that although this petrification of the scientific enterprise could largely be attributed to previous neoliberal' reforms' in the first instance, the remedy proposed is to redouble neoliberal policies, now under the rubric of 'open science'."

underestimates the opportunities for surveillance capitalism during a pandemic. Enthusiasm for innovation, the open commons, and the 'right to science' continue to conflate ethical conditions for bona fides research with capital purposes."

Such analyses, and the growth in the number of critical voices, is a welcome development, and a much needed one. My suspicion, however, is that they will not succeed in changing the way open access is being implemented, certainly in the near term.

What is surprising to me personally is that some OA advocates who appear to have reached similar conclusions as me are nonetheless inclined to criticise me when I share my views with the world. And it is those on the radical wing of the movement – and people who run scholar-led initiatives – who primarily do this. The oddity is that while they seem to agree with my assessment of the problems of Plan S, the undesirability of OA mandates, the dangers of pay-to-publish and corporate control, and the way in which OA is being refashioned for a neoliberal agenda, they appear to object to my writing about these issues. Is this further evidence of the intractably factional and tribal nature of the movement, or is it rather that they feel I have ignored them and their efforts, or failed to boost them in the way they feel I should have in reporting on OA?

It is true that I could have acknowledged the activities of groups like the Radical Open Access Collective, COAR, COPIM, PKP, LingOA, OLH, OBP IOI, SCOSS and ScholarLed etc. etc. more than I have done. But much as I see the value and desirability of the aspirations and energy behind these initiatives, when I started my blog I set myself the task of chronicling the OA movement, not advocating for open access, or for any particular flavour of it.[197] What I have tried to do is record the movement's arc of development over time and comment on the extent to which it seems probable that it will achieve the BOAI goals.[198] On its current trajectory it seems to me it is unlikely to achieve its objectives. And I suspect that the scholar-led initiatives will not have a large enough impact on events to influence OA's overall direction either.

It has not helped that when I seek to engage with some OA advocates, and scholar-led and non-profit OA publishers, they have at times proved oddly reluctant to complete interviews with me, even after agreeing to do them. This has happened a sufficient number of times that on the last occasion I decided to post the unanswered questions on my blog and make the point that the interviewee had pulled out.[199] As I see it, my task has been to ask probing questions (of legacy publishers, of non-profits, of OA advocates, of whomever) not to boost anyone or any particular type of access, initiative or faction. It is certainly surprising to me when people agree to do an interview and then object to the questions I ask and even decline to answer them, particularly when they self-present as advocates for greater openness and transparency.

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[197] True, while I am not an OA advocate, I have often argued that green OA is a better strategy than gold OA, particularly given that the latter usually means pay-to-publish gold OA which, as I argue, is highly problematic.
[198] In 2009, Stevan Harnad described me as, the movements' "chronicler, conscience, and gadfly laureate". That suits me.
[199] As a result of my publishing my own questions the organisation concerned ceased sending me their press releases or posting them to the mailing list I moderate!

Be that as it may, I have come to believe that the radical wing of the movement, and the OA scholar-led initiatives that have emerged in recent years, are niche[200], and likely to remain so. For this reason perhaps, they appear to have decided to make a virtue out of necessity, by proclaiming the virtues of what they call "scaling small". Their efforts, they say, are therefore "predicated on an ethic of care, in direct opposition to the cookie-cutter economies of scale preferred by the larger commercial publishers". The problem here is that the cookie-cutter economies of scale that neoliberalism encourages and rewards, and that large legacy publishers are able to deliver, are sucking up an increasing proportion of the research community's resources, leaving just crumbs for the rest.

This focus on "scaling small", by the way, seems to be in contrast to OLH's mission, which, it says, is "to propagate a model of fee-free OA worldwide at scale." But I could be misunderstanding the concept.[201] Either way, the rub here is that if the goal is to achieve universal open access then OA advocates might seem to have little choice but to think in terms of all-encompassing global and industrial initiatives, rather than cottage industries.[202]

Anyway, it is my belief that when we look back in 20 years or so these initiatives will be seen to have had little impact on the direction that scholarly communication (or open access) has taken.[203] More importantly, I suspect that many of them will prove unsustainable over time and will by then have disappeared.[204]

Of course, I could be wrong and in 20 years or so I could look very silly for having said that!

But why do I think scholar-led initiatives are unlikely to prove sustainable? Because in the main they are reliant on money from libraries and funders. As we have seen, library budgets

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[200] For a sense of some of the problems these initiatives face one can read this paper published by the Open Library of Humanities.

[201] Elsewhere, Lucy Barnes has said scaling small "should support the activities of a large number of various types of presses operating at a range of smaller scales, rather than being built to serve only the large commercial players or established university presses."

[202] There does seem to me to be a contradiction inherent in this position. Consider this from punctum books: "We have no intention to grow or merge in any usual sense of the word … We are interested in finding ways in which we can share resources, knowledges, and infrastructures in such a way that everyone can keep doing their thing at their own pace." In the same interview, Open Humanities Press says, "We've long thought success would also be to get to a stage where, actually, we don't need to do what we're doing anymore. It would be to arrive at a point where enough other people are publishing open access books and journals of critical theory on a non-profit, scholar-led basis for us to be able to turn our attention elsewhere." Scholar-Led also makes it clear that it is opposed to homogenisation. But given the economic and political environment in which scale is everything, and the zeitgeist of academia is increasingly neoliberal, we have to wonder how Scholar-Led initiatives can do anything but tinker at the edges of the system. Perhaps that is all they want to do. But it won't change the system of scholarly communication that they disapprove of.

[203] It is worth noting that in March cOAlition S announced that it was initiating a call for a study (funded by Science Europe) to conduct an analysis and overview of collaborative non-commercial (aka "Diamond") publishing journals and platforms. This is clearly good, but there has been no shortage of studies into open access. Providing long-term funding for non-commercial solutions is what is needed, not more studies.

[204] That said, both arXiv and the Public Knowledge Project have survived and flourished since, respectively, 1991 and 1998. But as the 2017 PKP annual report notes any organisation that relies on grant funding for a large portion of its revenue is in a precarious situation. Likewise, any organisation that has a donate button on its site is in a precarious situation (I should know, I have a button on my site). And the more scholar-led organisations that are created the more precarious they surely all become. arXiv and PKP were the first out of the gate and have acquired a great deal of mindshare. But as plans for Next-Generation arXiv are rolled out, some are questioning whether it will prove sustainable in the future.

have been hard pressed for many years (which, after all, is partly why the OA movement emerged in the first place) and the likelihood that they will have much money available for scholar-led and OA infrastructure initiatives in a post-pandemic world seems remote at this point.

And we have learned that funders prefer not to support projects beyond an initial set up phase. This means that if a scholar-led publishing initiative has not established an independent source of revenue by the time the grant money dries up[205] it is likely to face the stark choice of either shutting up shop or, as both Knowledge Unlatched and the Royal Historical Society had to do, selling out to a commercial organisation. The latter option is likely to see paywalls introduced, or business models adopted that OA advocates deprecate (there is some commentary on the lure of instrumentalisation here). In short, absent a viable commercial framework, scholarly communication initiatives struggle to survive.

In passing, I would note that in August 4TU.ResearchData announced that after over 10 years using the open source repository system Fedora it had decided to migrate a significant part of its technical infrastructure to a commercial solution offered by figshare. It had had to do this, it explained, because it is not currently financially and operationally practical to continue to rely on an open source solution. "While we acutely appreciate, understand and wholeheartedly support the strategic preference for Open Source infrastructures at academic institutions and in information management in particular, viable alternatives to commercial products are not always available."[206]

We could also note that a recent study found that between 2000 and 2019, 176 OA journals vanished from the web. And these were only the journals the authors had been able to find evidence of. Many more can be expected to have disappeared. One publisher the authors did not know about, for instance, disappeared off the face of the web during the same time period and took with it nearly 70 journals, all of whom have disappeared without trace.

Also noteworthy is that more than half of the journals the study found to have disappeared were in the social sciences and humanities and 88 of them were affiliated with a scholarly society or a research institution – i.e. non-profit.

The study identified another 900 journals that are still online but seem to have stopped publishing papers. They too, the authors warn, are vulnerable to vanishing in the near future. Elsewhere, the Internet Archive has estimated that 2.4 million open access articles are currently at risk of vanishing from the internet.

It seems that natural history journals are particularly vulnerable right now as a result of the funding shortages and loss of revenue that natural history museums are experiencing due to the pandemic. Many of these are diamond OA journals (of which more later).

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[205] An EU report published earlier this year noted that few research infrastructures outside the European Intergovernmental Research Organisation forum grouping "are able to demonstrate the characteristics required to achieve long-term sustainability."

[206] This portrayal of the current environment for open source solutions was challenged here.

Co-opted

I said that OA advocates lost control of their own movement and today find themselves on the side-lines of open access developments. I have suggested that the Finch report was a key moment in this process, as was I believe the moment that Berlin 12 went invitation only.

I have also suggested that a fixation with "doing stuff", combined with the absence of a theoretical framework for OA, has helped in this, as has the movement's inability to reach consensus on so many aspects of open access. It failed to cohere as a group or agree on a common strategy. And having failed to convince the wider research community of the merits of open access it lobbied the powers-that-be to force OA on the research community. When the powers-that-be took ownership of open access OA advocates found themselves increasingly pushed to the fringes, as governments, funders and publishers set about "retranslating" (to use Burgelman's phrase) OA for different *ends*. Since these *ends* appear not to be sufficiently aligned with those of BOAI this has proved problematic. It has seen the movement subverted, and open access refashioned for the needs of neoliberalism.[207]

As a result, OA advocates could be said to have conspired in the process of neoliberal capture. Indeed, one could argue that they did this is a very direct way by themselves deploying neoliberal arguments in order to get the attention of politicians. For instance, they produced reports (e.g. this one from 2006) arguing that OA would significantly increase the returns to investment in R&D by allowing companies to commercialise research. This, they argued, would see "the emergence of new industries based upon open access content." They even made quite specific claims such as that if there had been open access to all OECD research circa 2003 it would have increased the returns to R&D "by some USD 36 billion." A later report made similar claims. And others have used this approach to predict the financial benefits that would be achieved if open access to research was extended in the US.

I am not saying that exploiting research for economic advantage is not a good thing per se (clearly it can be a very good thing). I am saying that placing undue focus on commercial exploitation as a justification for making research OA has served to subvert the more high-minded aspirations of the BOAI. I am also not saying that capitalism is inherently bad or that it has not delivered a great deal of social and economic good over the years (although it has also caused a huge amount of social and environmental harm). What I am saying is that a purely capitalist framework for funding, organising and incentivising research and the activities of the research community, and as a primary justification for open access, is not the best way of going about things. Feeding the needs of capitalism was not what inspired the calls for open access, and it does not feature as a reason for OA in the BOAI declaration – which talks in terms of publishing "for the sake of inquiry and knowledge", not for economic gain. Apart from anything else, such a narrow focus cannot address the *equity* problem.

Nor am I saying that those who refashioned OA for primarily capitalist purposes acted in bad faith. I do not doubt that they are all well-intentioned people. The problem is that today we are all trapped in a brutal neoliberal machine from which there appears to be no obvious escape route, and which limits our scope of action. But it seems clear to me that publicly funded research ought not to be entirely subject to the laws and requirements of capitalism if

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[207] In fact, the movement may always have been destined to fail, for reasons I shall explain. If that is right, the BOAI goals may have been unachievable from the start.

we want it to be maximally effective.[208] The academic neoliberalism that this gives rise to also leads to the demeaning and debilitating Taylorism that has become endemic in universities. And it feeds the obsession with trying to calculate "excellence" and impact, and minutely measure and quantify everything researchers do, that goes with it. As Jean-Claude Guédon says "rankings exacerbate the competitive dimension of research for reasons that are not always related to research, or may even be inimical to the design of optimal research processes." None of this is conducive to achieving the BOAI goals.

Academic neoliberalism also forces researchers to waste huge amounts of time and effort applying for research grants that (due to excessively high demand) they are unlikely to get; and it leads to absurdities like universities treating the support services they provide for faculty as profit centres. So we see farcicalities like faculty being required to use their own institution's (often second-rate) conference and catering facilities when putting on events, for which they are charged highly inflated prices. This might be construed as an attempt to generate extraneous external revenue by (in effect) plundering research grants.

More importantly, I do not believe the economic case for open access has been satisfactory demonstrated. At the very least, I suspect it has been overstated. A Gates Foundation-published paper published last year (13 years after the report cited above arguing that had OA to OECD research been required it would have generated $36 billion) might seem to acknowledge as much. As the authors puts it, "The economic and social influence of OS [open science] partnerships may take years to materialise and may be subject to a plethora of diverse influences."[209] Although it does not say so directly, the paper might seem to imply that open science may never provide the expected benefits.[210]

So if I am reading the Gates paper correctly, it is proposing creating tools to measure whether, and if so how, open access and open science can (at some point later) be seen to have delivered economic and social benefits. If my understanding is right this would seem to imply that the whole open access/open science project has ultimately been more faith-based than evidence-based. That the UK OA policy was decided on the basis of how much it would cost the Exchequer to implement the different policy options, rather than on whether those policies would provide the expected economic benefits, might seem to confirm as much.

Perhaps I *do* misunderstand, but in reading the Gates paper I found it hard not to conclude that open access is at heart a huge social and economic experiment whose outcome is assumed more than demonstrated.

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[208] Publicly funded research, for instance, is generally the only place where fundamental (blue skies) research takes place. Neoliberalism's obsession with short-term goal-oriented scientific research projects, with pressure being applied on researchers to demonstrate the future application of their work, is not conducive to this.

[209] The Gates article calls for the creation of an open toolkit and data set, "based on internationally developed and open measures, to provide an evidence base through which we can collectively determine if, how, when, and where partnerships based on OS principles and practices can contribute to social and economic welfare in general and research and innovation (R&I) in particular." It is not entirely clear to me what "partnerships" mean here, but this is what the article says: "Despite these successful partnerships, many public research organizations, government policy-makers, researchers, and firms remain uncertain about the costs and benefits of OS and their distribution among stakeholders." Either way, it seems to be an admission that no one knows what the economic and social benefits of open science are, or even if there are any.

[210] Consider the comment in this article for further context. "So far, we have found that scientific resources are currently used only by companies in certain R&D-heavy fields. Our planned follow-up inquiries and questionnaires will try to shed light on whether open access to research outputs could change this."

A cynic might be tempted to conclude that the whole OA project grew out of a misunderstanding of the causes of the library *affordability* problem and a too literal interpretation of internet mantras like *information wants to be free*.

What has not helped is that open access has acted like hot wax onto which different interest groups and stakeholders have been able to stamp their own desires, wishes and fantasies. Oddly, for some OA advocates this appears to have been deliberate policy. The book I cited earlier ("Open Access in Theory and Practice") argues that many OA advocates purposely sought to keep the theoretical underpinning of open access "fuzzy" in order to attract a wider audience. As the book's authors put it, "there was a consciousness amongst some participants that decision makers, such as those in the policy arena, were not interested in theory, but would be more likely to respond positively to rhetorical or 'common sense' arguments. The argument, for example, that 'publicly funded research should be publicly available' as a rhetorical slogan may be more effective in persuading policymakers or politicians if assumed to be self-evidently true, rather than as a result of unpacking its theoretical basis."[211]

The problem with this approach, the authors add, is that such slogans "could be linked to quite different theoretical underpinnings." What clearly caught the attention of governments was the "common sense" claim that open access would help boost the economy. Yet to this day this has not (to my knowledge) been satisfactorily demonstrated and may never since it may not be true! Either way, it is not what BOAI was focused on. The BOAI declaration was about education and the sharing of knowledge with other researchers and the public, not driving the engines of industry.

Be that as it may, governments and funders became convinced that open access could deliver economic benefits. And since the OA movement was itself in some disarray, the powers-that-be set about appropriating the movement and refocusing open access on the beneficial *ends* they believed it should and could be used for. It must be disheartening for OA advocates that BOAI's promise to usher in a new age of global *equity*, and to unite humanity "*in a common intellectual conversation and quest for knowledge*", has in the process been sacrificed to these mooted economic *ends*.

Importantly, the powers-that-be quickly concluded that in order to achieve these *ends* as quickly as possible (Rooryck's "accelerated transition") some form of accommodation with legacy publishers was necessary.[212] They sought to do this through a combination of carrots and sticks. The carrots were to favour pay-to-publish gold OA and to demote green OA so that publisher revenues and profits would be protected and preserved; the sticks have included threats to outlaw publisher embargoes, to refuse to pay for hybrid OA and an insistence that publishers cease acquiring copyright in the papers they publish.

The aim therefore was to redirect rather than displace or downsize legacy publishers – which was not what OA advocates had anticipated would happen. This may in any case have been necessary since legacy publishers have acquired what might seem to be an unchallengeably dominant position in scholarly publishing and now own a disproportionally high number of scholarly journals – including many of the most prestigious ones. And as a result of acquiring

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[211] In talking about his new book on open access Martin Eve is explicit about how the book was intended to do this. (8.40 in this interview).

[212] As the G8 Statement put it, "We recognise the importance of peer review and the valuable role played by publishers, including Learned Societies. Increasing free access to peer-reviewed, published research results will require sustainable solutions."

many long-standing prestigious journals and their back issues they now effectively own much of the research corpus stretching back many years. They could, therefore, be said to now control the scientific record.

As Rooryck points out, it was also soon apparent to funders that most researchers want to continue publishing in what they view as the most prestigious journals, and these in the main belong to (or are controlled by) legacy publishers. It did not help that the OA movement had failed to come up with much in the way of viable alternatives.[213] [214] Even PLOS, which has managed to establish an important role for itself within the OA movement, is now viewed with suspicion by some OA advocates, not least because of its use of APCs.

It had also become clear that libraries were struggling to make green OA a viable solution, not least because of the significant practical difficulties they have faced in filling their institutional repositories. Importantly, the OA movement has struggled to create a viable OA infrastructure and effective discovery tools.[215] In addition, as Dekker pointed out in 2013, green OA leaves the subscription system intact.

The launch of OA2020 in 2015 is interesting for a number of reasons, not least that its founding document was the MPDL paper I referenced earlier. The paper was co-authored by MPDL's Deputy Librarian and Head of Information Ralf Schimmer and asserted that if the money currently locked up in the journal subscription system was "withdrawn and re-purposed for open access publishing services" it would be possible to engineer "a large-scale transformation of the current corpus of scientific subscription journals to an open access business model."

The paper acknowledged that while OA advocates had believed (and publishers had asserted) that hybrid OA would enable a smooth transaction to open access, in reality it had simply led to double dipping without any certainty that it would ever trigger a transition to OA. However, the paper went on to say, the offsetting agreements that had subsequently emerged – where expenditure on article processing charges over and above subscription payments was at least partially returned to the institution to avoid double charging – offered a viable way forward. As the authors put it, offsetting "is a progressed version of the hybrid model and promises for the first time to be a truly 'transitional' model." As such, they said, it could "become a major catalyst for manifesting the modern, digital services that have been envisioned for today's scholarly communication, along with becoming a vehicle for re-organising the respective cash flows, too."[216]

In other words, the MPDL paper was presented as proof of concept for the OA2020 initiative, whose stated goal was that of "replacing the subscription business model with new models

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[213] Some will argue, as Martin Eve does, that the Open Library of Humanities is an example of an effective alternative. But if one reads some of this blog posts one is left concluding that it has yet to prove itself a long-term solution and that many developments in the open access space will make its long-term survival harder.
[214] As I shall discuss, the acquisition of F1000Rearsch does not bode well for the future of alternative solutions.
[215] As Lettie Conrad has put it, "In the last few years, library discovery services and knowledge bases have only just begun to integrate OA publications with any notable impact, as most assumed users would magically discover freely available content on their own... These misconceptions have resulted in metadata and indexing gaps, undermining the visibility and accessibility of OA content across myriad scholarly search and discovery channels."
[216] Offsetting explicitly linked subscriptions and APCs, seeking to reduce the former as the latter grew. As can be seen, this too was soon controversial.

that ensure outputs are open and re-usable and that the costs behind their dissemination are transparent and economically sustainable."

Since then, "offsetting" agreements have morphed into "publish and read" (PAR), "read and publish" (RAP) and – with Plan S – transformative agreements (TAs), with the latter now viewed by many in the Global North as the best and fastest way of transitioning to open access. Above all, this is the model that Plan S is currently driving the world towards as it begins to be replicated beyond Europe, not least in the US. As noted, the problem is that transformative agreements are based on a pay-to-publish model and will be no less costly than the much-derided big deal.

The Finch Report, the Amsterdam Call for Action and Plan S are the consequences of funders and governments intervening in the scholarly communication market. What was interesting about MPDL's intervention was that it was an initiative of the *library* of a German non-governmental and non-profit association of research institutes (the Max Planck Society) and it proposed a strategy that was compatible with the one being pursued by funders and governments in Europe – i.e. a strategy majoring on pay-to-publish gold OA.[217]

It is no surprise, therefore that in 2019 cOAlition S and OA2020 signed a joint statement. This was despite the fact that OA2020 is an initiative of a German institution and no German funder or organisation has joined cOAlition S. Consensus over strategy aside, both groups appear to share a belief that – as Gerard Meijer, Director of the Fritz Haber Institute (FHI) of the Max Planck Society put it at the time the joint statement was announced – "there is more than enough money in the subscription system worldwide to make a complete transition to open access"

Given the repeated claim by librarians that the subscription system is unstainable and that transformative agreements are no less expensive, the real oddity of OA2020 is its claim that by redirecting money currently spent on subscriptions it would be possible to move to "sustainable OA business models." In fact, this claim is challenged by OA advocates, not least by Plan S ambassador Martin Eve.

Be that as it may, the assertion that *there is enough money in the current system* quickly became a mantra for those pushing for transformative agreements and, as noted, we can see a clear line from Finch, through the Amsterdam Call, to OA2020, to Plan S to the current fad for signing transformative agreements. What none of these initiatives appear to acknowledge is that it is highly unlikely that the strategy they are all pursuing will solve either the *affordability* or the *equity* problems. This must surely be troubling for OA advocates.

What Schimmer (and presumably MPDL and OA2020) also share with funders is a belief that legacy publishers are highly effective at what they do, and a safer pair of hands than the research community when it comes to publishing research. As Schimmer put it to Bloomberg earlier this year: publishers like Elsevier "are too good, and the academic community is just too divided."

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[217] There is some disagreement as to whether OA2020 was intended to move the world to pay-to-publish open access. Nevertheless, combined with Plan S, there currently seems little doubt but that this will be the end result. Moreover, as we saw, Max Planck has been an avid supporter of gold OA, from at least 2009 when it participated in SOAP.

In short, Schimmer, MPDL, OA2020, Plan S and (I assume) the EU[218] – appear all to have concluded that the fastest and most effective way to move beyond the subscription system is to persuade/compel publishers to migrate to pay-to-publish OA. And since librarians have long struggled with green OA, many seem inclined to agree and are signing transformative agreements, even though they do not believe this offers a realistic way of solving the two most important BOAI goals.

Why have some libraries lost sight of the *affordability* problem? Presumably, because they cannot see green OA providing an adequate solution. Also, perhaps, because they can see funders and others taking on some of the costs of scholarly communication by paying APCs. After all, UK Research and Innovation (UKRI) has been providing universities with block grants to cover APCs since 2013. And private funders like Wellcome, Gates and HHMI all now seem happy to pay the costs of publishing the research they have funded.[219]

As for governments and public funders: I have suggested that they may not view *affordability* to be the problem OA advocates claim it to be. (A view that Delta Think's analysis might seem to support). They also appear to believe that any costs incurred in making research OA can be offset by the expected economic gains that will be achieved by companies monetising it. That is, OA will more than pay for itself. [220]

In particular, it is believed that by allowing SMEs (especially those in the biotech, materials research and energy sectors) to exploit and monetise publicly funded research new companies and products will emerge and national GDP will be boosted.

This too is why funders and governments in the Global North want publicly funded research to be made available with no embargo and with a CC BY licence attached. They want there to

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[218] It is not clear to me the extent to which Horizon Europe, which starts on January 1st, 2021, will be Plan S compliant. However, cOAlition S lists the EU as a "supporter" and indicates that it will support the RRS but not transformative agreements. See also this presentation.

[219] Note however, the comment from Rooryck here: "For the most part, coalition S funders do not support TAs because they do not pay for subscriptions. Especially national funders won't support TAs because these are already covered by their national library consortia. So we were not planning to provide much detail here." This seems to be in some contrast to what cOAlition S says about transformative agreements in the Plan S Principles, and was comment that came as a surprise to librarians.

[220] OA advocates frequently cite claims that by making the data from the Human Genome Project (HGP) openly available the US federal government turned an investment of $3.9 billion into an economic output of $796 billion, a return on investment (ROI) to the U.S. economy of 141 to 1. That is, every $1 of federal HGP investment contributed to the generation of $141 in the economy. This is what Willets was impressed by. Another example often cited is weather data. In 2005, in an article entitled, *Public information wants to be free*, James Boyle argued that the US invests €19 billion in weather data. By making it freely available the country gets back in return €750 billion. What is important to note is that this is data, not research papers, and this seems to be a distinction that governments and funders fail to make when mandating OA.

[220] On the same theme, in 2012 the EU said it expected open data to provide an annual €40 billion boost to the European economy – by allowing "the reuse of public data by private companies and organisations". By 2020 it was predicting that the 2025 open data market would be worth €199.51 - €334.20 billion and would make huge cost savings. The logic here is that it does not matter if open access costs more to provide if the investment reaps a profit. It seems to me, however, that funders often conflate open access with open data both in the economic benefits they can provide and the need for reuse rights. One can clearly see why reuse is important for data (which after all is what the Human Genome Project was about) but requiring reuse of scholarly papers seems far less likely to provide great benefit. Those who say it is necessary for text mining purposes ignore the fact that changes to copyright laws would be sufficient (as the EU has done). But maybe I am missing something here.

be no restrictions on the commercial use of research. And the easiest way of achieving this is by means of pay-to-publish OA.

For their part, legacy publishers were never especially concerned about *affordability* historically. Despite constant complaints from librarians about costs (and the occasional cancelled big deal) most universities kept on paying. However, as calls for OA grew publishers found themselves caught in a pincer movement. On one side funders were demanding that they adopt open access; on the other side, black OA sites like Sci-Hub were undermining their traditional business model by illegally releasing their content from behind paywalls. Fortunately for them, however, funders and governments concluded that publishers were central to the OA project and so were willing to allow them to adopt a business model (pay-to-publish gold OA) that would preserve and protect their historic revenues. It is no surprise, therefore, that publishers decided to embrace open access.[221] Why wouldn't they?

The upshot was that publishers became born-again OA advocates[222] and set about steering open access in a direction that suited them. They did this by imposing green OA embargoes and by introducing hybrid OA.[223] These were, if you like, publishers' carrots and sticks. Fortuitously, these dovetailed with funders' carrots and sticks, and both parties were able to settle on pay-to-publish OA as a compromise solution that would meet both their needs.

Even more fortuitously, both groups have been able to maintain that this is conformant with the principles of open access. After all, they can say, OA advocates insist that "true open access" requires immediate OA and CC BY.[224] However, if one considers all three BOAI goals this is not correct, since the way OA is developing means that at least two of the goals will not be achieved. I have suggested that a more accurate way of characterising what has happened is that BOAI has been retrofitted for neoliberalism.

In short, governments, funders and publishers have co-opted open access and refashioned it for their mutual needs. This was possible because of a happy marriage of economic and political interests that pay-to-publish OA was able to satisfy. That they have been able to say that they are doing what OA advocates asked them to do, even as the two most important goals of BOAI have been jettisoned, has to be disappointing for OA advocates. It must be particularly galling for them that legacy publishers have been able to adapt their calls for open access in a way that is allowing them to migrate their profits to the new environment.

Today the movement is left with the questions I posed earlier: how can the research community establish what a fair price for publishing a research paper and/or journal is? How can it make sure it gets value for money from publishers? And how are these costs to be paid, and by whom? Simply shifting costs from the reader's side of the publishing process to the author's side might seem a rational and obvious thing to do. But if *affordability* is one of the problems you are trying to fix how can this help? True, governments and funders appear willing to start picking up at least part of the bill but that does not necessarily mean that the

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[221] As the then CEO of Springer put it to me in 2004 when Springer pioneered hybrid OA, "Let them put their money where their mouth is."

[222] This sticks in the craw of OA advocates, who, among other things, find the idea of companies like Elsevier holding webinars on open science and the reward system offensive!

[223] I.e. they hobbled green OA and developed a form of open access (hybrid OA) that allowed them to move the world to pay-to-publish. Today they are seeking to build on that by going helter-skelter for transformative agreements – which they anticipate will convert the world to pay-to-publish.

[224] In fact, BOAI did not stipulate *immediate* open access, a hole that it sought to plug at its tenth anniversary.

taxpayer – who ultimately pays – is getting better value for money, particularly since it will mean that there is less money available to pay for research in the first place. And from the perspective of the Global South, how does replacing a paywall with a playwall solve the *equity* problem.

Taking back control

It is unsurprising, therefore, that many OA advocates are unhappy with the way OA has developed .This has seen more of them coming to the conclusion that if the open access movement is to achieve its objectives then control of scholarly publishing will have to be wrested from the hands of for-profit publishers and [returned to the scholarly community](#).[225]

Some argue that the pandemic provides an ideal opportunity for achieving this, not least because they expect the existing infrastructure to struggle in the next few years. "Many key pieces of [the] scholarly research landscape are at risk of going out of business or consolidating by the end of the year", Kaitlin Thaney, executive director of Invest in Open Infrastructure ([IOI](#)) [said](#) in June. "Looking ahead 12-18 months, there is a real threat of infrastructure collapse, the severity and downstream effects of which are not yet fully known at this time."[226]

What better time, says Thaney, for the research community to converge "on community-controlled open scholarship projects, to both meet the demands of the moment, and build a more resilient system for scholarly communication for future crisis situations".

This is an exhilarating thought, but is it practical? So much of the research corpus and the publishing infrastructure is now in private hands that wresting back control may no longer be possible.[227] Moreover, small scholar-led and non-profit publishers will be more vulnerable to failure than for-profit publishers. More importantly, we have to wonder how a community owned publishing system would be funded over time.[228]

As I noted, funders are beginning to outsource the publishing of their own research to for-profit platforms like F1000Research. It is, however, far from clear that they would be willing or able to fund the creation of a community-owned OA infrastructure, especially government funders. Even organising the publication of their own research by outsourcing the task to a

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[225] In a joint [submission](#) to the OSTP RFI (in a section headed "costs"), the Association of American Universities, the Association of Public and Land-grant Universities, and Council on Governmental Relations say, "we encourage the agencies and OSTP to support the scientific enterprise in exploring new research dissemination models where peer-review is managed more directly by the academy. This may include peer-review managed by scholarly societies or other self-organized and proven models that ensure the quality of research articles at reasonable costs. Rethinking current practices will lessen the financial barriers to accessing research results."
[226] These ideas are detailed in a [document](#) called "Designing a Preparedness Model for the Future of Open Scholarship".
[227] Elsevier's ScienceDirect alone has 12 million pieces of content from 3,500 academic journals and 34,000 e-books.
[228] A recent SPARC [report](#) says it is important to note that for some (I suspect most) open science infrastructure (OSI) projects "sustainability is intrinsically linked to their ability to receive government or grant funding. Further, COVID-19 places risks on the continued availability of such funding in the future." It also says, "while many OSIs projects have been generously funded in this area over the years, and proven their value over time, many later struggle with operational costs in the absence of dependable mid-term or long-term funding solutions."

third party could be viewed as controversial. There are, for instance, conflict of interest issues to consider.

As Eve points out, "governmental funders may find themselves in breach of state aid rules if they establish their own rival platforms or do not open a full tendering process for any new platform." If nothing else, we might assume they are duty bound to outsource the management of the peer review process. That is, they probably need to employ an independent intermediary (i.e. publisher) to oversee publishing decisions, and to do the day-to-day management of the publishing process, if they want to avoid accusations that they are seeking to control what research is published (i.e. that governments want to regulate and censor the scholarly communication process). [229]

And for a government or government funder to set up an alternative publishing system that will compete with commercial publishers is to invite a political storm – as we shall see happened to the US National Institutes of Health in 1999.

Another option would be for universities and the wider research community to build a non-profit community-controlled infrastructure themselves. In recent years we have seen a number of scholar-led publishers emerge; and we have also seen new university presses launched. But could this be done at sufficient scale and sufficiently effectively? When *Undark* asked MIT Press Journals Director Nick Lindsay if university presses could take over from legacy publishers Lindsay noted that Elsevier alone probably publishes more journals than every single university press in the United States combined. To take back control, he added, would be a huge undertaking because "a tremendous amount of effort [would be needed] to capitalize the university presses to the point at which they could actually ingest all of that work.'"

Importantly, aside from a few dedicated researchers and OA advocates, there is little sign that the research community at large is either able and/or willing to commit the necessary time and resources to take back control of scholarly communication. Researchers' focus (quite rightly) is on teaching and research, not becoming a publisher.

Manpower and capacity aside, we are still left wondering how a community-controlled publishing infrastructure would be funded. Where would the money come from to do this, especially in a post-pandemic world? It is hard to see universities with presses (which are generally already heavily subsidised by their institutions) increasing financial support for the press. While we have seen a few new university presses established (e.g. here and here), there have also been closures (e.g. Australia's UWA Publishing). Even presses at large wealthy universities like Stanford are under some threat today. Would governments be willing to provide universities with the necessary funding to create an alternative scholarly publishing system? Personally, I doubt it.

Another possibility would be for the research community and/or libraries to seek to collectively pool the necessary money to fund library publishing and scholar-led initiatives – by means, for instance, of crowdfunding. This, after all, is essentially the model used by arXiv and OLH.[230]

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[229] For a sense of the potential issues here see this tweet stream.
[230] COPIM describes this model as a "library partnership subsidy model."

With this aim in mind, a number of initiatives have been launched in recent years to raise money for building a community-controlled publishing infrastructure. In her role as executive director of Invest in Open Infrastructure (IOI) this is what Thaney is currently focused on doing. Another such organisation is the Sustainability Coalition for Open Science Services SCOSS.

Founded in 2018, IOI had raised $270,000 by June this year and been pledged another $40,000. Since it was founded in 2017, SCOSS has raised €2.7 million ($3.2 million). It is sobering to reflect that together IOI and SCOSS have pooled sufficient funds to be able to maintain a preprint server like arXiv for less than a year and a half.[231]

Another project called ScholarlyHub was launched in 2018, with the goal of raising €100,000 by May last year. In the event it succeeded in raising just €16,500 and the service announced [the link is now dead] that in light of this disappointing response it was closing.[232]

Meanwhile, in November it was announced that the SHARE database – a project of the Association of Research Libraries, the Association of American Universities and the Association of Public and Land-grant Universities – was shutting down, and its collection of tens of millions of metadata records were being archived. And in 2018 the community-funded Digital Preservation Network had had to close when too few libraries renewed their membership and the service became unsustainable.

One problem with crowdfunding initiatives like these is that much of the money has to be raised from libraries. As we have seen, libraries have been underfunded for years and the situation can only worsen as a result of COVID-19. Private funders, meanwhile, generally prefer to give one-off grants and then move on to another project. They can also be fickle in their funding priorities.

Another model to gain mindshare recently is "Subscribe to Open" (S2O). The aim here is for libraries to continue paying subscriptions for journals they already subscribe to, on the understanding that if they do so the papers in the journals will be made open access. Explaining how it works, The American Society for Cell Biology (ASCB) says, "existing institutional subscribers will receive a 5% discount off of the regular subscription price if they agree to participate. If all existing subscribers agree to participate in S2O by early 2021, the journal's content will become completely open access for that year. If the plan is successful for 2021, the offer will be repeated annually."

The downside here is clear. As De Gruyter put it in introducing its S20 scheme: "If the number of subscriptions falls below a minimum value, the paywall is activated again and only subscribers are granted access."

With the decision on whether or not a journal will make its content open access made on an annual basis, and dependent on existing subscribers re-subscribing, such schemes are likely to see open access become a revolving door. To change the metaphor, open access could be turned on and off like a tap.

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[231] SCOSS is currently raising money for are DOAB, OAPEN, PKP and OpenCitations.
[232] Perhaps the most successful exponent of crowdfunding is Knowledge Unlatched but, as mentioned earlier, it is now a for-profit company and has attracted some controversy over its business models and its centralised nature. OA advocates also worry about its cookie-cutting scale. This is due, no doubt, to its for-profit mentality.

An additional problem is that the pool of libraries willing to contribute to crowdfunding schemes is not very high. Eve has estimated that around 300 will contribute to such schemes, which is less than 5% of the those who could. For many such schemes to be successful, therefore, it will be necessary to broaden the pool of contributors. With this aim in mind, COPIM recently partnered with the Central European University Press (CEUP) to pioneer a new model for funding OA monographs in which revenue generated from offering subscription access to 50 titles from the CEUP backlist will be used to fund the costs of making front list titles open access. This is expected to enlarge the pool of contributors, and so make more money available.[233] Eve concedes that once everything is open access libraries will be likely to drop out but says, "if the revenue isn't there, then the press continues to sell books, just as they did before." Is this not the same problem as journal crowdfunding schemes face?

Elsewhere, PLOS has developed a novel "Community Action Program" for its selective journals *PLOS Biology* and *PLOS Medicine*, as an alternative to the APC model they currently operate. Universities taking part obtain unlimited publishing opportunities in the journals for their researchers for a flat annual fee. This too is intended to increase the number of potential contributors as PLOS will require the institutions of both corresponding and contributing authors to be members of the scheme if they want to enjoy the free publishing rights. If they do not join, any faculty member wanting to publish in the journals will face a high "non-member fee" (NMF) that will increase in price each year. PLOS is also inviting institutions who have never published in the journals to join at a much-reduced rate, as an "insurance" against one of their authors submitting to them in the future.

One might view this as a variation on UC's multi-payer model but with (in effect) *read* institutions being encouraged to subsidise *publish* institutions rather than seeking to get funders to contribute to costs. Will it work? Time will tell. The scheme immediately attracted some pushback, but also some support.

It is likely that some of the "collective action" initiatives will prove successful, but they will face significant challenges. Not only is it far from clear that there is enough money in the system, but legacy publishers are so deeply dug in that they tend to suck up all the money available in library budgets. As PLOS' Sarah Rouhi pointed out in a webinar in September, if most or all of library budgets has to go to support expensive transformative agreements there will be little left for alternatives solutions. Or as she put it to me in November, "If these [TAs] are negotiated with large commercial publishers first, we're looking at new kind of 'big deal' that locks in library monies with subscription publishers of hybrid open-access journals. Non-profits, small societies, and native-OA publishers may very well not make it out the other side of this transition (especially if 'read' institutions' subscription monies exit the system)."

Talking in the context of open access monographs Erich van Rijn, Director of Journals and Open Access at University of California Press, said in September: "Given the current financial state that a lot of universities are going to find themselves in, I don't know if there is still the library appetite to come up with a collective-funding consortium."

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[233] As Eve puts it, "by selling a subscription to fund OA, we hope that libraries who have never supported an OA initiative will find themselves, by default, seeing the benefits of OA books."

Meanwhile, Springer Nature is trialling what it calls its "guided open access" model – intended, amongst other things, to "share costs more evenly over multiple authors." While the APC for *Nature* will be €9,500 ($11,390 or £8,290), some of the Nature-branded journals will levy a €2,190 ($2,604) non-refundable assessment fee to have papers peer-reviewed. If a paper passes muster the authors will then need to pay an additional €800 for papers accepted into *Communications* titles (bringing the overall cost to €2,990) while papers accepted for *Nature Physics*, *Nature Genetics* or *Nature Methods*, or *Nature Communications* will require payment of an extra €2,600 (taking the overall cost to €4,790).

This might seem to offer a further threat to collective action initiatives as it will allow a legacy publisher to absorb more of the money assigned by universities to open access. *Nature's* move is a direct response to Plan S, and demonstrates once again that the actions of funders and governments are allowing the oligopolists to migrate their profits into the new environment, leaving little left in the pot to enable more meaningful change.

I feel again compelled to repeat that by not being able to cohere as a group, and by using neoliberal and unsubstantiated "common sense" arguments to persuade funders to intervene OA advocates may have lost the ability to shape or control events in any meaningful way.[234]

This is what I call the OA dilemma.

OA Dilemma

The dilemma is this: complain as they might, neither the Radicals nor mainstream OA advocates appear any more to have much (if any) power to determine how open access develops – beyond being able to shame funders into bankrolling the occasional project to consider, for instance, price transparency,[235] OA publication infrastructures for monographs,[236] or non-commercial publishing models. As the trend for transformative agreements that Plan S has triggered (before it has even come into force) accelerates we might be forgiven for concluding that these studies [237] can do little more than pay lip service to solving the problems of *affordability* and *equity*.

Is this too cynical a view? Maybe not. Consider, for instance, that while Rooryck often responds to complaints that Plan S is too heavily focused on legacy publishers by saying that cOAlition S is neutral with respect to the various OA business models, he has also had to concede that, "Try as we might … we cannot wish the commercial publishers away. This is why Plan S engages squarely with commercial publishers, pursuing transparent, transformational agreements and transparent pricing."

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[234] In fact, this may have been inevitable, for reasons I shall explain. If so, it might seem to suggest that resolving all three BOAI goals was a doomed project from the start.

[235] See **Footnote 16 on Page 9**. cOAlition S has funded a project that was supposed to explore price transparency that we are now told is not concerned with cost accounting but providing a Trip Advisor type services to allow authors to validate publishers! In March, its Open Access Champion Johan Rooryck called for fairer APCs but said that trying to set a different price for each country would be too complex. Since then (as noted on **Page 50**) we have seen the final report on the cOAlition S transparency framework. Again, we are told that this not considered a cost account exercise, and it will not be no audited. Rather, said Rooryck, "we expect publishers to act with integrity."

[236] For a sense of the kind of conversations this grant money is leading to one could do worse than read this blog post.

[237] Also here.

What to me is most striking about Plan S is the apparent lack of forethought that was given to how it might work (or the possibility that it might have perverse effects) prior to announcing it and publishing a set of implementation guidelines, guidelines that have had to be adjusted a number of times. Should it not have undertaken the various studies it has subsequently commissioned before launching Plan S? And why is it funding these studies if it does not believe they offer practical solutions?

This struck me forcibly when, some 18 months after Plan S was announced, Jisc launched a survey into the impact that Plan S will have on small and medium publishers. Should not cOAlition S have undertaken such a survey itself before announcing the initiative? Does it not make the cOAlition S funders look as confused and chaotic as the OA movement looked when governments and funders decided to step in and take control of OA? Certainly, it makes the initiative look haphazard and (in the words of Dekker) "ambiguous". Depressingly, in this regard Plan S is typical of the way most OA policies have been introduced. The emphasis is always on "doing stuff", often illogical and counterproductive stuff at that.[238]

So, the dilemma OA advocates face is that they now appear to be as good as powerless to influence open access developments, even as they are becoming increasingly uncomfortable with the direction it is taking.

To pursue this dilemma further: as noted, many OA advocates now argue that the research community needs to take back control of scholarly communication. As such, they say, the North should be following the example of the Global South, especially those countries in Latin America who have been investing in "a cooperative infrastructure for scientific communication that is controlled by a broad-based inter-institutional academy".[239] This is the model being used by initiatives like SciELO, Redalyc[240] and AmeliCA.[241] If the North adopts a similar approach, OA advocates argue, it will be possible to achieve the BOAI goals.

But there is little evidence that governments and funders in the Global North are sympathetic to the idea, and/or willing to provide more than token grants to allow the research community to explore and experiment with such ideas.[242] And as we have seen, it seems highly unlikely that the research community would be able to take back ownership without far greater commitment from governments than they have yet evinced. Even if the commitment were there, it is far from clear that it would be possible given the lock that legacy publishers now have on the international publishing system.

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[238] That cOAlition S announced its price transparency initiative before giving any thought to how it would work is another example. It subsequently announced an RFI in order to see if anyone else could offer a solution.

[239] See also here and here.

[240] For background on Redalyc see this.

[241] There is also the African Journal Online (AJOL) scientific publishing ecosystem and the Indonesian system, which currently consists of 1,717 OA journals.

[242] In 2019 cOAlition S also funded a study into to explore a range of potential strategies and business models through which learned societies could adapt and thrive under Plan S. The authors of the study seemed particularly taken with having them enter into transformative agreements, and so created an OA transformative agreement toolkit.

When the idea was put to Rooryck, he responded by saying, "A payment for a transparently priced service[243] per unit of publication is more easily scalable, simpler to manage, and easier to justify than *arbitrary investments in not-for-profit publishing infrastructure that funders do not control* and which may be viewed as interference in the market". [My italics].

I interpret this to mean that cOAlition S believes that (love them or loathe them) legacy publishers offer the most practical way of transitioning to open access, that transformative agreements are the most suitable (and quickest) vehicle for achieving this, and that it is funders who should now be in control of open access development, not researchers. I also infer that – despite funding various projects to explore alternatives – cOAlition S does not believe these alternatives offer a sufficient, practical, desirable, cost-effective or fast enough route for the accelerated transition to open access that they want, and in any case funders should not (or cannot) invest in an alternative OA infrastructure.

Influential librarians appear similarly unsympathetic, or sceptical, about the notion of the research community taking back control. Schimmer – who as head of information provision at MPDL and member of the German Projekt DEAL group, is busy negotiating transformative agreements – told Bloomberg in January: "I find the idea that the research community could do the publishing itself to be utterly naïve." He added, "Why should libraries or academia do a better job than publishers?"

Elsewhere, Rick Anderson, University Librarian at Brigham Young University in the US, has expressed doubts that researchers even want that to happen. Writing in 2013, he said, "My sense is that, for better or worse, we are unlikely to see a major shift in academic journal publishing out of the commercial sector and into the academic one anytime soon. Not because there aren't downsides to the existing system, but because those who are freest to make meaningful decisions (authors and publishers) are the ones least likely to find fault with things as they are now and unlikely to see great value in either taking on (authors) or giving up (publishers) the roles that have accrued to them over the past few centuries."

For OA advocates in the Global South the OA dilemma is that funders like cOAlition S are seeking to impose a Eurocentric model of scholarly communication on the world and doing so in the teeth of resistance and complaints from those in the South. There are good reasons to be concerned since (unlike in the Global North) scholarly publishing in the South has to a large extent remained in the hands of academics and universities and, as we saw, the research community has been increasing its investment in local infrastructures.

The fear is that Plan S will pull the rug from under the feet of those in the South who are trying to retain and expand their community-owned infrastructures, or at least seriously weaken them.[244] And if European actions trigger a wholesale flip to pay-to-publish OA, many researchers in the Global South will find themselves locked out of the international publishing system, as paywalls are replaced by playwalls.

The irony is that the way scholarly publishing works in the Global South today is not dissimilar to how it used to work in the North, where Learned Societies and the research

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[243] This clearly overstates what the cOAlition S price transparency framework can deliver. See footnote on **Page 9.**

[244] The view in Latin America is that the commercial model of publishing being pushed by Plan S "weakens the existing open access ecosystem in Latin America", which has always operated an academic-led and not-for-profit model of scholarly publishing.

community were very much in control of the process. In the wake of WWII, however, the task was increasingly privatised, with entrepreneurs like Robert Maxwell seeing an opportunity to make money from scholarly publishing. To this end, he and other businesspeople began to launch new commercial journals, buy up other publishers, and persuade Learned Societies to outsource the publication of their journals to them. As I have said, the likelihood that control can now be wrested back from legacy publishers seems remote to me, particularly given that governments and funders appear to feel that legacy publishers do a good enough job and appear to believe that it is better that they work in partnership with these publishers rather than have the research community manage the process. Essentially this seems to be driven by the neoliberal desire to control everything researchers do, a desire that is inherent to the proliferation of ranking systems that have emerged.

The upshot is that cOAlition S members are actively negotiating transformative agreements that will, as we have seen, lock legacy publishers into the new OA environment. And it is applauding others who sign them, including funders who have declined to join the coalition.[245] We have also seen the architect of Plan S (now president of Eindhoven University of Technology) hailing an agreement between Dutch funders and Elsevier, even though the President of one of the funders involved (NWO) conceded that the agreement is not fully compliant with Plan S. (Since most authors still have to transfer copyright to Elsevier).

We saw earlier that there is an expectation that these transformative agreements will evolve into a system based on publishing platforms, and we can see the seeds of this in the trend for funders to outsource the publishing of their own research to for-profit companies like F1000Research. Amongst those to do so are the Wellcome Trust, the Gates Foundation, the Irish Health Research Board, the UK Association of Medical Research Charities (AMRC), The UCL Great Ormond Street Institute and the African Academy of Sciences.

Initially, OA advocates welcomed this development, not least because F1000Research had successfully marketed itself as a right-on alternative to legacy publishers. However, in January, it was announced that F1000Research had been acquired by oligopolist Taylor & Francis.

This is a further example of the OA dilemma. Now that an oligopolist has conquered and occupied territory that OA advocates had viewed as the promised land the decision by funders to outsource their publishing needs to a small entrepreneurial company looks far less appealing, and demonstrates that there is no limit to the ways in which oligopolists can co-opt open access.

The then open access envoy for the EC, Burgelman[246] responded by tweeting that the acquisition looks "very promising for open science. By contrast, a member of the Radical

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[245] No German funder has signed Plan S, partly it seems because there is a belief that doing so would conflict with Germany's strong academic freedom laws, partly perhaps out of national pride. Many European countries have been keen to present themselves as "leaders" in open access, including the Germans, the British and the Dutch, and now the EU as a bloc.

[246] Earlier this year Burgelman stepped down from his role as EU open access envoy. His role has apparently been taken on by the head of the EU's Open Science Unit Kostas Glinos, although in more of an administrative role. Either way, I doubt the EU is going any time soon to take a less parochially competitive view than Burgelman. Indeed, all the statements that come out of the EU with regard to its digital strategy have the same

89 Open access: *"Information wants to be free"*?

Open Access Collective Samuel Moore noted mournfully that the acquisition simply confirmed that Plan S is leading to further commercialisation and market consolidation. Here we see two different views. But who has greater power to decide the future of open access: funders like cOAlition S and the EU, or OA advocates?

For their part, aware of their diminished ability to control events, and clearly now conflicted about F1000Research, some other OA advocates seemed uncharacteristically shy about criticising the acquisition.[247] While evidently made uncomfortable by the news, one merely noted that he hoped T&F will "take good care" of the company. Another suggested that having not bought F1000Research themselves and "opened the code" Gates and Wellcome had missed an opportunity.[248]

As a further blow to OA advocates, shortly after T&F acquired the company, the EU announced that it too had awarded a contract to F1000Research, which will now run the EU's Open Research Europe (ORE) platform to be launched in January and for which papers are already being sought.[249]

T&F's acquisition of F1000Research also raised new questions about the extent to which even funders can manage and control how open access develops. As Eve commented, "Taylor & Francis is now able to profit even if it does not act to convert its current roster of hybrid titles to pure gold, as Plan S demands. This is a de-risking strategy for the organization that allows it to profit in either circumstance."

What is interesting about the acquisition, however, is that it might seem to confirm the EUA Report's conclusions as to how scholarly publishing is likely to develop. And it suggests that legacy publishers may not need to build their own publishing platforms but simply buy them in and (presumably) at some point merge them with their current systems.

It is also worth thinking about the model offered by F100Research in the context of Rooryck's statement about funders not wanting to invest in infrastructure that they do not control. If a funder uses a for-profit company to manage its publishing platform does it really have the control that Rooryck believes funders should have? True, the F1000Research solution allows them to present themselves as the "owners" of the platform, but is that the case in a practical sense? Doubtless F1000Research provides assurances that once the contract ends a funder can take its research to another provider. But is that sufficient control? After all, F1000Research is a proprietary system and it controls and manages the content in the branded platforms.

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basis message. In unveiling the EU's proposals for the strategy for the bloc (here and here), for instance, Commission President Ursula von der Leyen said: "We want the digital transformation to power our economy and we want to find European solutions in the digital age." This implies to me that the general approach of the EU to open access, open data and open science is one of scientific nationalism (or regionalism).

[247] We have over time seen an increasing number of the darlings of open access fall into the hands of legacy publishers, a development that has disappointed OA advocates. BMC, for instance, was acquired by Springer in 2008; SSRN and bepress were acquired by Elsevier in 2016 and 2017; and in 2016 the non-profit Knowledge Unlatched was transformed from a UK non-profit CIC to a for-profit GmbH and relocated to Berlin.

[248] In other words, they should have acquired F1000Research and made the code running the platform open source. But would this have been a possible solution? We have seen the political issues associated with funders running their own publishing platforms. There is also no shortage of those who believe that the open source movement has also been co-opted by large commercial organisations. And we saw the comments from 4TU.ResearchData.

[249] The new platform has received a mixed response from researchers.

Specifically, whatever assurances may be given about funders being able to take their content with them how easy and/or convenient is it to take research from a proprietary platform and move it to a new one? How much would it cost to do this? Is it not more likely that simple inertia will make continuing with F1000Research the easiest option, even if the company routinely increases its prices? We need at least to ask these kinds of questions.

As a side note when, in 2018, I asked Gates Foundation's Ashley Farley what Gates was paying to use the F1000Research platform she replied, "The maintenance fees are commercially sensitive information, and I will not be revealing them." Where does Plan S's price transparency framework fit in here?

In short, what level of control will Wellcome and Gates have over their branded publishing platforms, and therefore of their research? Likewise, what level of control will the EU have over the research in its branded platform, particularly given that the service runs on proprietary software?[250]

Since funders insist on the use of CC BY it could be argued that they do not actually want to "own" the research they fund. But is this really the case? Either way, it suggests they would be wise to – at the very least – mirror copies of the papers they have funded on a publicly owned repository. If they don't, they risk the possibility of paywalls later being erected around their research. If that were to happen, and there were no free copies of the papers available elsewhere, those papers would no longer be OA in any practical sense. (I outline such a scenario below).

An important point to make here is that historically scholarly articles were bought by libraries in the shape of physical paper journals, which were then stored in a multitude of libraries around the world. While the publishers may have owned the copyright in these journals, the physical copies became the property of the libraries that bought them, potentially in perpetuity. Today libraries only buy *access* to digital content. This content can potentially disappear overnight from central servers and/or be enclosed behind a paywall. (This is one reason why libraries started to demand PTAs. However, in an OA world this solution might seem moot).

It is, therefore, hard not to conclude that to ensure publicly funded research remains open access indefinitely public repositories need to be created and maintained. And this will surely become more necessary in light of the EUA report's expectation that the whole scholarly publishing system is likely to migrate to one based on for-profit publisher-owned platforms.

Perhaps the most recent example of the OA dilemma came in October, when MPDL signed a transformative agreement with Springer Nature. This will allow German researchers to publish in *Nature* and 33 other Nature-branded titles under open-access terms based on an APC of €9,500, or over $11,000.

OA advocates were appalled at the news. "It is a bad deal for universities, it's not a bad deal for Nature,' Peter Suber told *Chemistry World*. "Paying this 'prestige tax' to publish in

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Nature is a bad idea. Libraries end up paying for *Nature*'s high rejection rate, not higher discoverability or visibility.'

Suber, we could note, is the de facto leader of the open access movement. He attended the BOAI meeting and was the primary author of the BOAI declaration.

Elsewhere, Dutch OA advocates Jeroen Bosman and Bianca Kramer said, "Agreements that arrange for paying exorbitant amounts for publishing OA in prestigious journals do nothing to improve the accessibility and equitability of the scholarly publishing system, and merely show everything can be had if you just throw enough money at it."

When further information about the APC pricing for Nature journals was published in November – including details of the "guided open access" pilot I mention on **P. 86** – Twitter exploded in indignation, with one OA advocate describing it as "the collapse of open access". Elsewhere, a researcher suggested that the $11,390 that would now be required to publish in *Nature* would be enough to fund a decent research proposal in India, or to make an entry level instrument in the country. With Plan S clearly responsible for Nature's decision, Regius Professor Lee Cronin tweeted succinctly, "Plan S must die." (See also)

Let me repeat: while it may be right to say that OA advocates are not a homogeneous group (given their conflicting views on OA if nothing else) I do not doubt that they all support the three BOAI goals – i.e. to resolve the problems of *affordability*, *accessibility* and *equity*. But by failing to agree on the *means* for achieving those goals, by not constantly checking that the *means* they were proposing might have unintended consequences, and by insisting that funders and governments force open access on their colleagues, they lost control of their own movement and allowed other actors – governments, funders, and publishers – to co-opt it for other *ends*.

As a consequence, open access has become a servant to different *ends* than those articulated in 2002. And since this means that all OA advocates face the same dilemma I believe it is not unreasonable to characterise open access advocates as being members of a "homogenous 'movement'"

One OA advocate complained recently (I assume in reference to transformative agreements), "You would think that with the fiasco of golden OA and big deals, the #openaccess establishment would have learnt a lesson or two. Well, apparently not. Was it ever about openly/freely disseminating our research outputs?"

For the wider research community it has meant ever more oppressive OA mandates, discriminatory pay-to-publish gold OA, predatory publishing, and now transformative agreements that will be no more affordable than the big deals they are replacing and which are expected to evolve into a system based on publisher-owned platforms. The latter will be no less costly a solution, and will threaten the research community with more worrying perverse effects – as I shall argue later.

In short, OA has introduced new forms of inequality, poses new threats to *academic freedom* and is set to sacrifice *affordability* and *equity* on the altar of greater *accessibility*. And worse could be to come.

Sustainability: one of the worst weasel words?

To their credit, OA advocates do not as a rule give up. Instead, they shift their focus; and, as I noted earlier, they are today focussed on advocating for the research community to "take back control" of scholarly publishing – by means, for instance, of scholar-led initiatives and building a community-owned OA infrastructure.

I have expressed doubts about the feasibility of this but let me consider one specific strategy now being widely promoted. That is, we are today seeing greater interest in diamond open access (AKA platinum OA) a model in which journals charge neither publishing fees nor access fees. Diamond OA journals are usually funded by academic institutions, learned societies, philanthropists, government grants etc.[251]

Diamond OA is not new: indeed, OA advocates have consistently maintained that most OA journals do not charge an APC, although Hilda Bastian (amongst others) has pointed out that this claim is not quite what it appears. Moreover, while the number of articles published by gold journals is currently growing rapidly, the number published by diamond journals is said to be levelling off. As such, diamond OA may already be on the decline.

The biggest challenge with diamond OA is the same as for all community-owned OA initiatives: funding is often short-term and insecure. As money gets tighter in the post-pandemic world, many diamond OA journals can be expected to struggle, particularly if (as I anticipate) the fad for transformative agreements puts ever greater pressure on learned societies, on small publishers and on library-based publishing programs.

In short, diamond OA journals may not prove the panacea that OA advocates hope they will. In particular, the refrain that OA journals do not charge an APC ignores the fact that invisibilising costs does not mean that they have somehow been magicked away. Someone, somehow, still has to pay the costs of running diamond OA journals. True, some of this will be covered by volunteer labour and hidden in institutional budgets – but as will be evident from the comments I cite on **Page 138**, this brings its own problems. In any case, when all is said and done, the taxpayer is the funder of last resort.

Ironically, the new focus on non-profit alternatives could be said to have taken the OA movement in a circle. SPARC's initial strategy, let us recall, was to partner with non-profit learned societies to create new low-cost journals like *Organic Letters*. This was not a success. It is also not encouraging that today *Organic Letters* is a hybrid journal that still sells subscriptions while also offering pay-to-publish OA at a price of $4,000 per paper (for non-ACS members), *plus* an additional $1,000 for authors who are required to attach a CC BY licence to their papers. Nor is it encouraging that only around 12% of the journals hosted by BioOne – the online service co-founded by SPARC in 1999 – are open access today.

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[251] Speculating on how they cover their costs, in 2006, Suber said, "Some no-fee OA journals have direct or indirect subsidies from institutions like universities, laboratories, research centers, libraries, hospitals, museums, learned societies, foundations, or government agencies. Some have revenue from a separate line of non-OA publications. Some have revenue from advertising, auxiliary services, membership dues, endowments, reprints, or a print or premium edition. Some rely, more than other journals, on volunteerism. Some undoubtedly use a combination of these means." This has been cited by OA advocates over the years, most recently by Jisc in 2018.

However, we should not be surprised if OA advocates have a tendency to be a little naïve about funding and business models. In their jobs, neither librarians nor researchers generally have to worry about creating financially self-sustaining programs, projects and initiatives, or generating long-term durable revenue streams. Library budgets are allocated by their institutions on a perceived need basis. This does mean that libraries are vulnerable to the whims of administrators – in fact, if Delta Think's analysis is right, the *affordability* problem was in part a product of libraries being starved of funding – but they do not as a rule have to worry about being financially viable in the way businesses do.

The same can be said of funding research projects, where money is usually allocated on a project-by-project basis. That is, it is provided as a time-limited grant and rarely on a recurring basis. Even something as high profile as Europe's €1 billion Human Brain Project cannot assume it will be funded over the long-term.

So the typical model for research funding is that a PI/research group will apply for a grant for a set period of time for a defined project. When the grant runs out, they have to apply for a new grant or start a new project and apply for that to be funded. Again, this makes for a highly undesirable and precarious existence, but it does mean that researchers don't generally have to fret about creating revenue streams and business models.[252] Indeed as we saw, researchers tend to view the very notion of a "business model" as a frustrating, if not pointless, activity.

The consequent gap in understanding between publishers and researchers was outlined by Mark Carden in 2015 here, and perhaps it explains in part why OA advocates assume that publishers are parasitic on the research community.

On the Scholcomm mailing list recently one OA advocate asserted that sustainability is "one of the worst weasel words I know." He added, "Basic research is largely supported by public money; it is not sustainable. It is heavily subsidized. Thinking that nothing escapes market mechanisms is nothing more than an ideological stance in the last analysis."

Of course, he is right, but as I shall suggest later, OA advocates' demand for open access is itself an ideological stance (just a different one). And while I am deeply sympathetic to the ideological stance of OA advocates (as I perceive it) I have to wonder, given today's neoliberal environment, what the alternative is to using for-profit legacy publishers and treating scholarly communication as a market, particularly given governments' and funders' apparent unwillingness, or inability, to create a publicly funded OA infrastructure.

In other words, given the dominant political ideology that governs how the research community has to operate today, the reality is that if the scholarly communication system is to be managed efficiently and effectively, and safeguarded over time, notions of sustainability and business models cannot be avoided. Indeed, whatever one's ideological stance, and whatever one's views on costs, it is hard not to agree with Schimmer that for-profit publishers have done the job well enough over the past 70 odd years.

This leads me again to suggest that much of the frustration the OA movement has experienced stems from unrealistic expectations about the costs of scholarly publishing. OA

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[252] This short-termism is problematic even within the context of doing research. And it is surely similar to the short-termism of politicians, which is also viewed as problematic.

advocates were led astray by a belief that information not only "wants" but in today's online environment "can", "should" and "must" be free, without giving sufficient thought to what it costs to collect, organise and distribute that information and how those costs can be funded. Repeating overly simplistic arguments about *rival vs. nonrival goods* also does not help.

I would love to see diamond OA and scholar-led solutions take off and for the research community to take back control in a way that allows it to deliver on the promises of BOAI. But I do not think that invisibilising costs, deriding the notion of sustainability, and demonising publishers is always helpful.

A cynical chronicler of the OA movement might be tempted to characterise its history as the pursuit of a series of strategies, policies and initiatives that each in its turn has been seen to fail or go awry – from self-archiving, to pay-to-publish OA journals, to hybrid OA, to transformative agreements. And I anticipate the same future awaits preprint servers, publishing platforms, diamond OA, scholar-led projects, and crowdfunding and "collective action" initiatives. This repeated cycle of high hopes dashed by brutal experience surely stems in part from unrealistic expectations about what is possible. Above all, each new strategy has failed to solve either the *affordability* or *equity* problems and we have yet to see the *accessibility* problem solved.

On this last point, it may be worth noting that despite the flood of OA policies and mandates, and the incessant and at times strident OA advocacy we have seen in recent years, the EU Open Science Monitor seems to imply that open access reached a peak in 2016 (41.2%) and has since fallen (to 36.2% in 2018, as green OA fell dramatically). I see no sign yet that all the efforts and all the money expended on open access over nearly quarter of a century has solved the *accessibilit*y problem, or delivered the promised economic benefits (maybe I missed them?) The Open Science Monitor graph may look better once the 2019 figures are available, but the COKI Dashboard (which includes 2019 figures) suggests a similar picture of a falling graph.

Former Managing Director of Academic Publishing at Cambridge University Press, Richard Fisher emailed me the following thoughts earlier this year: "If one core objective of what we are not supposed to call the 'open access movement'[253] was to reduce the levels of profit extracted from the legacy model by major commercial providers like Elsevier and Springer, and to reduce their overall market domination, then clearly it has failed.

"If one core objective of what we are not supposed to call the 'open access movement' was to address the serials crisis, and the challenge for libraries posed by particularly the massive increase in global research outputs in the present century (concomitant with the huge increase in research emanating from China and India), without commensurate budget enhancements, then it has clearly failed.

"If one core objective of what we are not supposed to call the 'open access movement' was to 'take back control' of the process of scholarly communications, then it has only succeeded very partially, and arguably only in much smaller disciplinary contexts than Big Science, and even then only very partially.

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[253] When I asked Fisher what he meant by this he replied, "as the fragmentation of both *ends* and *means* amongst those most enthusiastic about the overall principles of OA becomes ever more apparent. OA movements (plural) would be much more accurate in 2020, I think."

"BUT (and it is a very big but) if one core objective of what we are not supposed to call the 'open access movement' was to open up a lot of specialised research and data to wider scrutiny, then it has clearly made very significant progress, if not the progress the signatories to (say) the Budapest Declaration would have hoped for by now."

To this I would add that while the open access movement may have failed to achieve the BOAI goals it has helped surface a number of important issues that were not on the radar in 2002, including the reproducibility problem and the accompanying lack of transparency in the *processes* of research. In addition, it has brought to our attention in a graphic way the damaging "publish or perish" culture in academia and the problems of "publication bias". These issues could in fact be said to be further by-products of academic neoliberalism which, as I have suggested, is not conducive to producing good science or managing the research environment effectively. It also invites a question as to whether OA as conceived by BOAI is actually possible in a neoliberal environment. I will come back to this.

Above all, I think we need to acknowledge that open access cannot be viewed as an unmitigated good.

Platforms, portals, and discoverability

Q: Can you say more about why you think open access cannot be viewed as an unmitigated good?

A: Sure. Let me start by repeating that one of the internet's foundational principles was that *information wants to be free*. As I have said, however, providing online services and information sharing platforms is not a costless process. In order to provide free services, therefore, web companies developed novel business models to try and square that circle. Unfortunately, these models have turned out to be deeply problematic.

This is most evident in the consumer space today, where search and social media companies like Facebook and Google engage in what Shoshana Zuboff calls "surveillance capitalism". As I noted earlier, in order to fund the free content and services they offer, these companies monetise the data exhaust that we all give off when online. And they do so in ways that raise worrying issues, not just about privacy[254] but autonomy, self-determination, and human agency. This suggests to me that openness is not an unmitigated good.

Turning to scholarly communication, we have seen that the push for open access has given rise to a troubling pay-to-publish business model. This is troubling not just because it has enabled predatory publishing to emerge and flourish, but because it encouraged publishers to develop problematic new types of peer review. Critics worry, for instance, that since these new models have lowered the bar of acceptance for publication they have led to a flood of papers of doubtful or limited value being published, along with papers that are plain wrong, fraudulent, or at least unscientific.[255]

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[254] In 2018 Cambridge Analytic collected data about users without their permission and may have collected data on as many as 87 million people.
[255] See this paper here for instance.

This new "light" model of peer review (which asks reviewers to assess papers on whether they are "technically sound" rather than on whether they have perceived novelty, impact, or 'journal fit'")[256] was pioneered in 2006 by OA publisher PLOS when it launched PLOS ONE. We could note that the *Retraction Watch* database, records that 101 articles were retracted by PLOS ONE last year.[257] And these would have just been those papers that attracted people's attention. Many papers apparently sink without trace.[258]

The larger issue here is that pay-to-publish OA has created an environment in which publishers are directly incentivised to publish as many papers as possible. Lowering the peer review bar is a logical response to pay-to-publish OA since the more papers it can accept the greater a publisher's revenues. This is not, however, in the best interests of science.

As a consequence, argue critics, we have seen a growth in retractions and more and more papers circulating that, even if technically sound, add little or no value to the scientific record and so are essentially a waste of time, effort, and public money. As we shall see, the pandemic has made this problem worse. And since many of these papers increase the level of noise, they exacerbate the *discoverability* problem that researchers face today and are having a detrimental effect on scientific integrity. Clearly, the implications for *affordability* are significant as well.

This suggests to me that open access is not an unmitigated good.

More broadly, we have discovered that in an online world new business models not only have implications for revenue, but they can have negative scientific, political, social, and legal consequences.

So, what do I mean when I talk about the *discoverability* problem? I mean that the more research papers there are, the harder it is to find the needle in the haystack. The lighter review model, the flood of preprints, and the multiple versions of papers that open access has unleashed on the world, are exacerbating the problem.[259] Unfortunately, the OA movement has to date failed to develop an adequate solution to the *discoverability* problem it is has helped to create.[260] Legacy publishers, however, will develop solutions.[261] And in doing so, they will be able to increase their control over scholarly communication. Ironically, OA

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[256] In many cases, say critics, these papers have no real value at all.

[257] PLOS argue that this is the result of dealing with a backlog of papers that (presumably) should never have been published. That may be so, but it is a large backlog.

[258] This is a difficult area as the exact number of papers that are never cited is contested. However, even where a paper is cited, it doesn't necessarily mean it has been read, let along assessed in any detail, or even perhaps understood. In addition, papers are often cited in order to draw attention to their flaws. This is not something to treat as a measure of success!

[259] Is it estimated that an additional 3 million articles are published each year, and I suspect that figure does not include preprints. Another estimate is that there are now 50 million articles. The pandemic has increased this significantly.

[260] As Lettie Conrad puts it, "Libraries of all kinds are struggling to expose patrons to freely available content alongside traditional print and digital resources … most assumed users would magically discover freely available content on their own… These misconceptions have resulted in metadata and indexing gaps, undermining the visibility and accessibility of OA content across myriad scholarly search and discovery channels."

[261] An article earlier this year noted that subscription journals already play an important role in making open research discoverable and useful "and thus still have a role to play even in open publication strategies." I am saying that their role here will increase substantially.

advocates' insistence that "true open access" requires that papers have a liberal Creative Commons licences (CC BY, CC0 etc.) attached to them will further help legacy publishers do this.

The point is that when CC BY licences are attached to papers those papers no longer need to be tethered to the originating publisher but can flow freely across the network. Currently this tends to happen in a haphazard and unorganised way. And since papers are now often available in many different versions on many different parts of the internet it is creating a considerable degree of chaos. Amongst other things, doing a literature search, or trying to locate the definitive version of a paper, is becoming increasingly difficult. There is therefore a great opportunity for legacy publishers to develop new products to address the *discoverability* problem. The resulting products will be viewed as indispensable and they will enable publishers to increase their control. More importantly, they will be able to appropriate publicly funded research in lucrative new ways. This is not what OA advocates anticipated. They assumed that OA would loosen publishers' control.

In short, widespread use of liberal licences will enable publishers to monetise not only the papers they publish themselves, but any paper on the web with a CC BY or equivalent licence attached to it.[262] They will be legally free to harvest papers from other publishers' web sites, institutional repositories, preprint servers, authors' and institutional web sites etc. etc.[263] Once harvested, these papers could be added to the large content platforms publishers have built up over the years.[264] On the plus side, this has the potential to solve the *discoverability* problem that OA has helped create. It could also see many papers saved from extinction – as noted, the Internet Archive estimates that 2.4 million open access articles are already at risk of vanishing from the web.

Importantly, publishers will be able to create very compelling one-stop shops for scientists and scholars. And as they set out to develop ever more sophisticated AI technology they will naturally want to aggregate as much content as possible, both to train their algorithms and in order to develop new products able to mine and analyse textual data. As the research corpus continues to grow, disperse, and in some cases disappear, so universities (as well as companies of course) will view these new services as "must-have" products.

Unfortunately for advocates of openness these new services will inevitably be sold as new subscription products.[265]

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[262] It is precisely for doing this that Knowledge Unlatched was criticised by OA advocates. But that is what businesses will naturally (and legitimately) seek to do if they can make money out of doing so.

[263] I am not aware that publishers are doing this at the moment, but I suspect the only thing stopping them is that currently there is a period of uncertainty and mutual fear about the implications of publishers harvesting each other's content. Today the focus, as Esposito has pointed out, is on trying to control leakage of paywalled content. Here too there is fear and uncertainty, as evidenced by the fact that while some publishers are suing ResearchGate for enabling researchers to disseminate papers published in subscription journals on its platform, Springer Nature has partnered with the company. The battle over open access content is yet to come, and the winners I believe will be those with the largest and most sophisticated platforms and discovery tools.

[264] As noted, Elsevier's ScienceDirect has 12 million pieces of content from 3,500 academic journals and 34,000 e-books, with over 1.2 million open access articles. Imagine how this can be enhanced with the rising tide of CC BY papers being unleashed on the world.

[265] Some will doubtless use a freemium model, where basic features are free but the level of service that serious research requires will have to be paid-for.

In other words, we can expect publishers to develop powerful new platforms that offer ever more sophisticated valued-added discovery tools, analytics, and associated services. As the OA advocates who penned this *Science* article (which ironically is paywalled!) point out, as open access causes publishers' subscription revenues to fall so they will naturally seek to replace them with new sources of revenue. Amongst other things, the authors say, this will see "the growing ownership of data analytics, hosting, and portal services by large scholarly publishers."

The *Science* article goes on to suggest that we will also see large disciplinary portals emerge that, amongst other things, might include, "Systematic collections of research data and publications, conference proceedings, discussion threads, relevant events, and perhaps even media coverage and job postings."

And as publishers develop these new platforms and portals, they will be able to commingle proprietary content with OA content and sell access to both. This could see OA content appropriated and sold in new proprietary services – a practice some call openwrapping. This is something that Knowledge Unlatched was criticised for seeking to do.

OA advocates are inclined to dismiss these concerns by saying that there is no problem with legacy publishers harvesting CC content on the web and building new subscription services around it because "other people can actually compete with Elsevier on that and make a similar thing with a different business model if they want."

And they argue "once everything is CC-BY, any hobbyist programmer can build a fully-functioning competing search tool in a weekend. Many will. And some of those tools will be world-changingly effective."

This I do not agree with. My expectation rather is that success here will be dependent on having access to high levels of technical expertise and, vitally, capital. These are things that non-profit and scholar-led initiatives (not to mention hobbyists) do not have ready access to. For-profit publishers, however, do.

Speaking in 2016 at the time when Elsevier acquired the preprint server SSRN, the co-founder of the research analytics company Science-Metrix Eric Archambault noted: "Only fools think we are witnessing an opening of research knowledge dissemination. The winners of open data and open access will be large corporate concerns. Research is big business and there are huge economies of scale in that industry, just as in so many others. Consolidation is the name of the game, and amateur bricolage solutions are giving way to corporate professional solutions, whether we like it or not." [266]

Two years later Archambault sold his analytics company to Elsevier.[267]

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[266] Elsewhere, publishing consultant David Worlock has said, "The days when the barriers to entry in publishing were notoriously low may be coming to an end."

[267] And two years after the sale I note that Science-Metrix's web page describes itself as "an independent research evaluation firm specializing in the assessment of science and technology (S&T) activities." The only mention of Elsevier appears to be on the privacy policy page. This tells us that users may not even know they are using services and tools that below to an oligopolist.

99 Open access: *"Information wants to be free"*?

Importantly, by being able to add OA content to proprietary content and building new (likely patented) tools[268] around that content, legacy publishers will be in a position to offer unique propositions that others will not be able to match. Rather than the services that publishers provide being commodified (as OA advocates predicted), they will be valorised in new ways. And due to the sheer size and complexity of the new platforms, databases, portals and tools, and the costs of developing and managing them, it will likely only be the oligopolists who will be in a position to develop and maintain them. As such, we can expect to see the latter dominate the new market even more thoroughly than they dominate the scholarly publishing market today.

And with OA advocates now demanding changes to copyright laws the harvesting of scholarly content is likely to become easier and broader in scope. There are calls, for instance for publicly funded research to be open access automatically (perhaps by mandating the use of CC BY or CC0 in the manner of cOAlition S's RRS). There are also calls for copyright protection to be entirely "abandoned for academic works" (overturning the principle of the Berne Convention in which copyright automatically comes into existence at the moment a work is "fixed in a tangible medium of expression"). Those arguing for such changes say that were this to happen "there would be nothing in it for commercial publishers" to seek to monetise publicly funded research. I am suggesting the reverse: that it would make it easier for them to do so, and to do so more lucratively.

It is for this reason that I believe publicly funded and managed repositories outside the control of for-profit publishers will become vital, if only to ensure that research funded by the taxpayer remains freely available even if it is captured and trapped behind paywalls.

The good news is that there are today a number of non-profit multi-disciplinary search engines that index web-based scholarly resources, including BASE and CORE. Both the latter services now host around 200 million records and offer one-stop discovery points. However, aside from the fact that researchers do not appear to be using them as discovery tools (and maybe are unaware of them), these services cannot offer access to the full text of many of the documents they index, often just the metadata.[269] This is in part because, unlike legacy publishers, they cannot offer access to proprietary content. This puts services like BASE and CORE at a disadvantage.

More importantly, these services are not financially self-sustaining. To continue operating they have to regularly apply for funding. CORE is dependent on Jisc, which itself is dependent on funding from UKRI and other UK research funders, and BASE is dependent on EU projects like ORCID.DE and OpenAIRE, the latter itself being dependent on EU grants from Horizon. Long-term funding cannot, therefore, be guaranteed. And I am told that getting funding renewed is becoming more difficult. Apart from anything else, the funding situation makes it unlikely that these services will ever be able to offer the kind of sophisticated tools that publishers will be able to deploy.[270] That said, they are at least able to capture and host publicly funded research and so do provide a very valuable service – at least for so long as their funding is continued.

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[268] In 2016 OA advocates were enraged to learn that Elsevier had been granted a patent for an "Online peer review system and method".

[269] 60% of BASE content is open access.

[270] That is not to say they are not developing tools like CORE Recommender. But without the necessary capital they won't be able to match for-profit companies.

100 Open access: "*Information wants to be free*"?

It is worth noting that the first such indexing service – OAIster – was developed by the University of Michigan in 2002. In 2009 the service was taken over by OCLC and now indexes over 30 million records from institutional repositories. The service is still freely available. It is, however, also searchable on OCLC FirstSearch – which is a subscription service.[271]

There is, of course, also Google Scholar, which is said to index 160 million scholarly documents today. While Google Scholar is widely used and well regarded by researchers and librarians, it does have its limitations, not least because it indexes documents somewhat indiscriminately. There are claims, for instance, that it indexes content from predatory publishers. Like BASE and CORE, Google is also limited when it comes to full text – currently it seems only between 40% 60% of scientific articles are available in full text via Google Scholar links. And as we know, Google often loses interest in products and closes them down – as the Google Products Graveyard has been cataloguing.

Another service to mention is The Lens, which was originally created as a by-product of Richard Jefferson's Biological Open Source Movement. Currently this hosts 120 million global patent documents linked to a searchable database of over 220 million scholarly works and their metadata. This is compiled and normalised from a number of different sources, including Microsoft Academic (MA). It is not clear how many of the MA records link to full-text sources as Microsoft does not publish the data (for reasons that are not entirely clear). However it seems that only between 25% and 30% of the records of journal articles in The Lens link through to full text. Like all non-profit concerns in the area of scholarly communication, The Lens has had some difficulty obtaining funding over the years.

Interestingly, the best example of a publicly funded research repository today is PubMed Central (PMC). This is funded by the US government and its long-term funding seems secure, suggesting that there is *some* government commitment here. As I shall explain, however, political support for such initiatives is limited and PMC could have been so much more. It also only covers biomedical and life sciences.

In the meantime, publishers are busy developing and acquiring new products targeted at the research process itself.[272] As such, we can expect them to be able to offer massive content databases and data repositories, a growing portfolio of discovery and analytics tools, cloud services *and also* lab and workflow tools. All of these will be capable of being combined, connected, and linked together as a single service or sold on a modular basis.

One worrying consequence of publishers starting to offer research workflow solutions is that it could put them in a position to track and monitor scientists and their research much as social media companies track users and their activities. Potentially, therefore, publishers could know who researchers are collaborating with and the details of what they are working on, including perhaps what drugs they are developing, much earlier in the development pipeline than the rest of the world and even before other research groups and competitors do.[273] This strikes me as a dangerous power for a private organisation to have.

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[271] OCLC is a non-profit that in 2017 appears to have paid its CEO $1,756,131. It has also attracted criticism from OA advocates over the restrictive licence it is attaching to its metadata.

[272] For a schematic of this see Roger Schonfeld's article here.

[273] Usage tracking is all in the online world. In announcing that it had upgrade its web site recently, for instance, Cambridge University Press noted that it would better enable it to track usage.

As such, publishers could be in a position to know (or guess) the outcome of a research project before the lab or research group has submitted or published any papers, or given any presentations about it.[274] And as publishers' products and portals get bigger, offer ever more unique functionality, envelope more open content and evolve into a new generation of publishing platforms, vendor lock-in will become a real issue – with the implications for *affordability* that arise from that.

Essentially, the aim of the new publishing platform/portal/analytics companies will be to monetise and control every part of the research process. (See the second image on Page 6 of this paper for a sense of how Elsevier is already present throughout much of the research lifecycle). In doing so, they will not only be able to engage in surveillance capitalism but to develop business models based on what some refer to as data capitalism. As this post puts it, "commercial companies [will be able to] create operating systems with highly integrated services, which scientists use in every phase of their daily work and which by the way produce data about this work."

What is interesting here is that the transformative agreement looks likely to provide publishers with a transition path to the platforms and portals that commentators anticipate becoming the future model for scholarly publishing. Already, says SPARC, we are seeing the "bigger deal" emerge. Here a publisher may offer a new transformative agreement to a research institution at a lower cost, on the understanding that it is tied to other products, services or commitments. This may be a commitment to share data/metadata about the institution's researchers and their research in order to help the publisher develop analytics tools and new portal products for instance. Or, says SPARC, it could see institutional content licensing "directly linked to the purchase of data analytics services."

In the process this is likely to see the publishing platforms envisaged in the EUA report being built out of, built alongside, or merged with, the portals that SPARC anticipates. For the moment we can only speculate as to how this might play out. Nevertheless, in May we saw what could be viewed as the first "bigger deal" signed when a group of Dutch funders entered into a novel agreement with Elsevier. The deal encompasses *read* and *publish* rights *plus* an option for Dutch universities to assist Elsevier develop new services (by presumably providing data). The aim, it seems, is that they will "partner" in the development of open science projects that will include the exchange of data. It could also commit them to using Elsevier's data services. As such, universities could find themselves once again providing the raw material for publishers to create new services, which will then be sold back to the research community.

Reporting on the deal, ScienceGuide said: "On the one hand, the contract contains a – by now – relatively common 'read and publish' deal for academic publications. On the other hand, it introduces a unique 'open science and services agreement' that is aimed at executing projects with (meta)data, for example to support management and policy decisions."

It added: "Without a doubt, the share of open access articles by Dutch (corresponding) authors will rise in the coming years. And perhaps €84 million is a fair price to pay. But any judgement on this is impeded by the basic fact that the two services are tied together."

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[274] Publishers will doubtless say that they do not track individual users and perhaps they will not. But there are ways and ways of making sense of data without knowing individual users' names and details. See these comments from Richard Jefferson for more on this.

Unsurprisingly, the new direction that publishers are taking has sounded alarm bells for some in the research community. One response has been to start drafting guidelines intended to help universities and consortia think through the issues and navigate the treacherous new waters that "bigger deals" will pitch them into. Last year, for instance, a taskforce was put together by Dutch funders to produce a Guiding Principles Document.

This is clearly a sensible thing to do. As industry commentator Claudio Aspesi has pointed out, the terms and conditions for these emerging new models are being established today. Once a few universities and consortia have signed such agreements changing the nature and shape of them later will be very difficult – as librarians discovered with the big deal.

What proved most odd, however, is that the Dutch funders who had commissioned the Guiding Principles document went ahead and signed the deal with Elsevier before the guidelines had been completed. Sarah de Rijcke, one of the taskforce members, expressed some surprise at this, and warned of the "undesired platform effects" the deal could have. She added that the Elsevier agreement may not satisfy all the criteria recommended by the taskforce.

And in a separate blog post she said it is "an open question whether Elsevier systems will be made open and inclusive enough to comply with the Guiding Principles we formulated on behalf of the research institutions." She concluded, "I am not persuaded by the contract, and still find it disconcerting that this deal may effectively transfer crucial means to influence Dutch science policy to a monopolistic private enterprise." (See also).[275]

Dutch OA advocates were likewise concerned. Jeroen Bosman, for instance, commented: "The principles come too late. They have been spurred by and drafted during the most important negotiation for which they should apply. That means that they have lost a chance to make a difference and perhaps more important that the issues dealt with in the principles are potentially too much oriented towards the type of deals and collaborations of that specific deal. They are moulded for that (Elsevier) deal but not applied to that Elsevier deal."

New iteration of an old model

This reminds us that the research community has always faced a "collective action problem". That is, institutions, funders, and researchers often pull in different directions, and in ways focused more on meeting their specific individual or institutional needs, rather than the needs of the community at large. This puts them at a disadvantage *vis-à-vis* publishers, who are far more focused.

The rush by libraries to sign big deals twenty years ago – despite being alerted to the dangers by Kenneth Frazier in 2001 – is a case in point. Frazier advised his fellow librarians to be very cautious about signing big deals, pointing out that they placed universities in what he called a prisoner's dilemma.[276] By signing them, he said, universities would gain "short-term institutional benefits [that would be] achieved at the long-term expense of the academic

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[275] Commenting on the deal Esposito and Clarke said, "Elsevier may have cleverly and surreptitiously scored a win here."

[276] Rebecca Bryant, Senior Program Officer with OCLC says of universities that they suffer from "a failure of social interoperability."

community." In addition, he said, big deals would "weaken the power of librarians and consumers to influence scholarly communication systems."

Amongst other things, the big deal gives publishers greater control over what journals institutions provide for their faculty and reduces the power of librarians commensurately, in effect the decision is to a great extent outsourced. This has made the notion of "collection development" (long considered a primary task of librarians) begin to look somewhat moot where the purchase of scholarly journals is concerned. And as the big deal has devoured more and more of the library budget it has impacted on how many monographs a university can afford to buy as well.

As libraries and funders begin to contemplate signing "bigger deals" (or set about unbundling their existing big deals) I think they find themselves in a similar prisoner's dilemma. While bigger deals might provide short-term savings and/or increase the number of faculty papers made open access this could come at an unanticipated long-term cost, both to the university concerned and to the larger research community.

The underlying problem is that universities are encouraged to compete with one another more than co-operate, reminding us again that neoliberalism is not an appropriate model for managing universities and the research process. In fact, the whole notion of the "research community" might look like a misnomer today. Either way, if the bigger deal takes off it is likely to have negative long-term implications, much as the big deal did before it.

Nevertheless, this is where the transformative agreement seems to be headed, with a likely endpoint being widescale use of for-profit publishing platforms, as envisaged in the EUA report. And the likelihood is that over time they will develop into, or merge with, the all-encompassing portals that SPARC warns about.

These developments, says Moore, will allow publishers to engage in data capitalism, platform capitalism, datafication and extractivism. As he puts it, "The datafication embedded within transformative agreements is worrying not just because of the increased surveillance it will entail, it also illustrates more general misdirection of the transition to open access and the potential danger of universities to use researcher data as part of negotiations. Open access was initially premised on the idea that publishers are extracting from the free labour of academics and privatising the gains through closed-access publications. But through transformative agreements, publishers are still parasitic on this labour in addition to their new strategies of extractivism."

In short, the "bigger deal" and the new services and platforms that publishers are beginning to develop will allow them to embed themselves further and further into the research lifecycle and to monetise publicly funded research in new and (many believe) highly undesirable ways. The consequences cannot be predicted, but it will surely make the research community even more dependent on legacy publishers.

Sarah de Rijcke worries that it will also provide monopolistic private enterprises with the means to influence national science policy. One could argue that this was foreshadowed in the way the research community outsourced the evaluation of both researchers and universities to private companies – e.g. via Clarivate's JIF and Elsevier's Web of Science, Scopus and SciVal, and the THE's Times Higher World University Rankings (for which Elsevier supplies the data). The neoliberal philosophy underlying such rankings has had

undesirable consequences for the kind of research undertaken and how and where it is published. It has also negatively influenced how universities operate and how they perceive their role in society.

Publishers inevitably present such arrangements as partnerships with universities, but the truth is that there are inherent conflicts of interest.[277] The tragedy is that such partnerships have helped universities to become the neoliberal organisations they are today, increasingly acting in ways that work against the traditional notion of what a university is and the role it should play in society. If for no other reason, I find it hard not to conclude that the oligopolists should never have been allowed to become as dominant and powerful as they now are. This is not only undesirable in itself, but it has put them in a position where they are now positioned to increase that power in an OA world and in even more undesirable ways, ways that I believe should be viewed with grave concern. OA advocates have tended to focus on issues of cost, profits and access, but I believe the real danger lies in the power these companies are likely to be able to exert in the new era of platform capitalism that Mirowski warned of.

In some ways open access could be viewed as a new iteration of an old model. Implicit in this model is the assumption that the research community produces content, ideas and innovation and for-profit companies take it and exploit it for commercial gain, often in the process selling it back to the research community that created it. Some view this as a synergistic relationship, others as a predatory one.

As I see it, this model became explicit government policy *vis-à-vis* inventions with the passing of the US Bayh–Dole Act in 1980,[278] a model that has to a great extent become the norm in the Global North.[279]

Since the passing of the Bayh-Dole Act universities, non-profit research institutions and small businesses have been allowed to patent and commercialise any inventions they develop under federally funded research programs. Previously patent rights tended to be assigned to the federal government,[280] which meant that the invention often languished unused in the way that Brand and Wozniak complained that corporate IP sometimes does.[281]

Importantly, the rights given to universities by Bayh-Dole came with a responsibility to actively develop and commercialise any inventions arising from their research grants, usually by licensing them to a commercial organisation.

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[277] The fact is that publisher interests do not ever align with those of universities and researchers in many ways. For a sense of how commercial publishers and researchers inevitably struggle to reach accommodation with one another in information production and dissemination it is instructive to listen to what Emma Ganley of the for-profit open access company Protocols.io has to say about the open infrastructure principles for third party involvement being developed by OA advocates here. (16 minutes in). She outlines problems on governance, open collaboration with commercial organisations, and interoperability amongst other things.
[278] Formally known as the Patent and Trademark Law Amendments Act.
[279] Some argue, for instance, that the breakup of the British Technology Group was the British equivalent of the Bayh-Dole Act.
[280] It also authorised federal agencies to grant exclusive licenses to inventions owned by the federal government.
[281] Wikipedia reports that prior to the enactment of Bayh-Dole, the US government had accumulated 28,000 patents, but fewer than 5% of those patents were commercially licensed.

One could argue that the model of open access now being pursued by funders in the Global North (certainly in Europe) takes this one stage further, in so far as the goal is to allow for-profit companies to commercialise not inventions but publicly funded research and data. In this case, however, companies do not need to negotiate (and pay for) a licence to use it, since funders are insisting that it is made available with a pre-existing (free) licence (CC BY or CC0) attached. As such, companies can now just scoop it up and monetise it at will, and without needing to seek permission.

The logic of this model is that commercial organisations should be free to treat everything that researchers create and do under a publicly funded research programme as potential raw material for them to exploit for commercial gain.

Stuck in lockdown earlier this year publishing consultant David Worlock spent time watching webinars by scientists in which they were showcasing new OA workflow tools they had been developing (what Worlock called micro-publishing techniques).[282] Worlock subsequently published a blog post in which he noted, "The one thing they [all] have in common is collaboration around common needs."

Addressing his publisher audience, Worlock added, "We really need to pay attention because this is where and how innovation takes place. This is where and how needs are discovered. If granularity, *discoverability* and speed to market are the critical issues here, then those are the issues that we must attend to, instead of packing articles with greater amounts of supplemental material, holding articles in peer review until they are 'complete' or using citations to game journal impact factors."

He continued: "In all of this work of adding small pieces to the jigsaw and making sure they did not get lost or overlooked – curation is clearly at the heart of these efforts – I heard nothing described in terms of workflows or process that would not have been identical in a commercial environment."

Warlock concluded, "Rather than propagandising the virtues of 'traditional publishing' commercial publishers should be forming relationships that help change take place cost-effectively and at scale."

I read this to mean that Worlock believes commercial publishers should now be emulating (or acquiring) the new technologies and techniques that researchers are developing to aid them in the workflow process, with a view to refining, improving and commercialising them, and then (presumably) selling them back to the research community. Worlock's recommendation seems to be for publishers to co-opt the new collaboration, micropublishing and workflow tools that researchers are developing much as they have co-opted open access.

In fact, large publishers like Elsevier have been doing this for some time in the area of analytics. As a sign of how important it views the future of data management and analytics, several years ago Elsevier rebranded itself as a "an information analytics" business – a clear signal that the company is no longer interested in simply collecting, packaging and selling content produced by researchers, but also developing new tools to mine, sort and analyse that content. In addition, it is now collecting and mining (meta)data *produced by and about*

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[282] MicroPublishing in this context, says Worlock, means the publication of short, single experiment, peer reviewed OA articles, with DOIs and metadata to make them citable and discoverable.

researchers. And as publishers embed themselves ever deeper into the research lifecycle they will be aiming to capture and monetise a whole range of new types of information and data. And the bigger deal could be key here.

If open access becomes the norm and publishers migrate from a business model in which they sell access to content to selling access to discovery, analytics, and workflow tools will their interest in content fade? I have suggested not. So in fact has Elsevier Chairman YS Chi who said in 2108 quite categorically: "let me make it clear that we are not ever going to take our hands off the content curation. Having the content in a structured and curated way is very important to the analytics business." And I have suggested that structured and curated research content is going to be even more important in an OA environment, and that it will provide publishers with lucrative new ways of making money.

Importantly, by wrapping new paid-for tools and subscription services around content publishers will potentially be able to sell it even where it is nominally open access.

Again, at heart this is a long-standing model in which for-profit companies acquire content, data, techniques and innovation produced by the research community, add value to it, bundle and combine it, and then sell it – often back to the community that created it in the first place.

In the context of scholarly publishing OA advocates argue that this is a predatory model. Whether one agrees will perhaps depend in part on whether one feels the value being added by publishers is sufficient to justify the costs of the resulting products and services – i.e. whether these products are being sold at a fair and reasonable price. Clearly, whether those costs are affordable is also important, as the history of the big deal shows. As noted, however, the challenge the research community has always faced is that it has not been able to establish whether the price it is paying is fair and reasonable. In addition, the people whose responsibility it is to pay for these services – librarians – have been increasingly starved of money. As we enter the new world of open science, pricing will clearly still be a big concern, but it may come to be viewed as a less pressing concern than other things. A more important issue, for instance, might be whether for-profit companies are able to acquire undue control and influence over the research process, and even perhaps over national science policies.[283]

These are difficult matters to resolve. Researchers are surely going to need ever more sophisticated and powerful research tools. If governments are unwilling (or cannot) provide a publicly owned OA infrastructure (and the necessary discovery and analytics tools to support that infrastructure) and/or to adequately support non-profits to allow *them* to do so, then large commercial organisations inevitably will provide them. In fact, given the massified nature of the research endeavour today only legacy publishers may have the necessary capital and scale to do so. And as I have suggested, scale will become even more important in an open science environment.

The bottom line is that the research community does not currently have access to the capital that would be needed to create a community-owned infrastructure and it is not clear where it would come from. This suggests that – whatever the situation may be with scholarly publishing today – in the anticipated world of universal open access the oligopoly may indeed

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[283] Of course, the pricing will be a function of the degree of power publishers have, but I am suggesting that price may not be the main issue.

be predatory, or at least far too dominant. The question then becomes: will governments be prepared to regulate the market and if so, how?

Either way, we must wonder why the oligopolists were allowed to acquire the power they have today. Given that they may be able to leverage that power in new and undesirable ways in the evolving open science landscape it is surely troubling.

For-profit companies will always take and exploit whatever they can freely obtain if they believe it has potential value for them – be it new techniques, content, data, innovation, whatever – and they will then seek to monetise it in as profitable a way as possible. Since at least 1980 governments have encouraged this. The issue is at what point does that practice become inappropriate and/or predatory?

On the positive side, the innovation, research, ideas, and data that publishers have and will be able to take and exploit might otherwise remain unexploited, or not efficiently or adequately exploited. This is what Bayh-Dole was about (although Bayh-Dole assumed companies would pay something for what they took); this is the point that Brand and Wozniak were puzzling over when the *information wants to be free* meme was born; and this is what funders and governments in the Global North want to encourage by insisting that research and research data is made freely available. For funders this is the point of open access. My point is that if companies are as a result able to acquire excessive money and/or power by doing so governments should be looking to regulate the market, not introducing policies that will facilitate a new power grab.

As publishers build their large platforms and portals, and as the size and functionality of the resulting infrastructure increases, the research community will not only be vulnerable to vendor lock-in (leaving them little choice but to pay the asking price), but they will be vulnerable to undesirable data extractivism and surveillance capitalism. More worryingly, the potential for private companies to unduly shape, influence and control science will become greater. At some point, what by rights should be political decisions could start to be taken, or unduly directed, by private companies. I believe it will also see researchers further proletarianised and *academic freedom* eroded – all of which is detrimental to the research process.

It is concerning, therefore, that governments and funders appear blasé about the dangers ahead. More worryingly there are reasons to think that they do not understand them – even as their fixation on open access is set to increase and exacerbate the problems. In other words, by intervening in the market in the manner of Plan S, funders look likely not only to lock legacy publishers and their prices into the new OA environment, but to increase their power and influence, both over science and science policy, in worrying ways. While governments *are* intervening in the market, they are doing so not to regulate or control publishers but to increase the policing and control of the research community. Apart from anything else, this is further tipping the balance of power away from the research community in favour of publishers.

There is no doubt we need to create a digital environments for researchers and scholarship (both in the sciences and the humanities), and provide them with AI and new technical tools.[284] But there are real dangers in outsourcing everything to for-profit companies. That is

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[284] Consider some of the reasons outlined in the interview here for instance.

why those who are calling for a community-owned open scholarly publishing infrastructure and publicly funded tools to manage and exploit that infrastructure make a very good point. The question is who is going to fund, create, develop, and manage these tools in today's political and economic environment? As things stand, it looks set to be private companies who do so. This is where the risk lies.

When explaining why the 4TU.ResearchData repository was moved from an open source solution to the for-profit figshare, Marta Teperek & Alastair Dunning said "[S]omeone needs to develop, organise and sustain long-term maintenance of such open source alternatives. Who will that be? There are many organisations facing this challenge." Indeed, the whole research community faces this challenge.

I believe we could have been in a very different place today had the research community not lost a key battle in 1999, when the then NIH director Harold Varmus floated the idea of developing E-Biomed, a "community-based effort to establish an electronic publishing site" for the biomedical sciences.

For its time, E-Biomed was a radical and exciting proposal to create an open access environment that could have avoided many of the problems we see today. E-Biomed would have provided an infrastructure for sharing research that was owned and managed by the research community. It would have included both a preprint server and a publishing platform. Crucially, it would have been learned societies and editorial boards of researchers in the driving seat, not for-profit publishers.

It was also assumed that authors would retain copyright in their works but, unlike today's obsession with CC BY, they would not have been obligated to allow commercial reuse of their works. As the E-Biomed proposal put it, "Portions of reports could be reproduced only with the permission of the authors."

It added that this was a matter "that could largely be left to individual editorial boards to resolve … the advisory board might … want to consider the possibility that some 'fair use' policy should be adhered to by all journals participating in the system, even those that choose to retain copyright."

Importantly, these decisions would have been made by authors themselves or by their community, not publishers or funders. Had Varmus succeeded with E-Biomed the model would likely have propagated across the research community at large, and the history of the OA movement would have been quite different.

However, because it was viewed as being so radical – and was seen as a direct threaten to publishers' revenues – Varmus' proposal sparked a huge furore. The upshot was that the plan was significantly scaled back and launched a year later as PubMed Central – "a free digital repository that archives open access full-text scholarly articles that have been published in biomedical and life sciences journals."

In other words, publishers created such a fuss and lobbied so hard against the plan that they succeeded in keeping themselves at the heart of the publishing process, and the primary maintainers and controllers of the research corpus. Speaking in 2003, Varmus noted ironically, "I must have known that I was not going to be at NIH for much longer, because

this caused a tremendous political argument: what the hell was I trying to do to destroy the publication industry."

Even the stripped down and far less ambitious PMC was controversial, with some arguing that it was a waste of public money. However, if we consider how scholarly publishing has developed since then, and how it is likely to develop going forward, it is hard not to conclude that E-Biomed was a huge, missed opportunity. Nevertheless, the scaled-down PubMed we see today plays an important and growing role, in so far as it offers a publicly funded repository of open access research in the biomedical sciences. It has also been developing some interesting new tools – e.g. SciLite (which integrates text-mined annotations from different sources and overlays those outputs on research articles). But E-Biomed could have been so much more and it could have offered a very different model to what we see today.[285]

Could the E-Biomed concept be revived? Not, I suspect, in today's political environment. If it was viewed as politically unacceptable in 1999, it would be viewed as even more unacceptable today. Importantly, in their struggle with Varmus in 2003 publishers won a decisive battle, and this win was built on in 2012 with the Finch Report and with the subsequent events in Europe I described earlier.

In this context it is worth discussing the EU's plan to build a European Open Science Cloud (EOSC). This is envisaged as a technical infrastructure that will provide researchers with "a virtual environment with open and seamless services for storage, management, analysis and re-use of research data, across borders and scientific disciplines by federating existing scientific data infrastructures." And it will not be owned and managed by publishers but by the research community.

ESOC has not faced the same pushback from publishers that we saw with E-Biomed. I suspect this is because publishers' historic business models were not built around research data, although they are now taking a much greater interest, not least by setting up data repositories like figshare and Mendeley Data and data journals like *Scientific Nature*.[286]

I also suspect the EU's decision to build EOSC reflects a growing awareness amongst funders that there is greater economic value in data than there is in research papers. Perhaps the EU also felt that there was a window of opportunity that EOSC could slip through before publishers and technology companies monopolised this part of the science infrastructure too. The question is whether the EU will prove more successful in realising its plan than the NIH was with E-Biomed in 1999.

I think the EU faces three challenges: financial, technical and social. On the first, the EU has said that it expects EOSC to be self-sustaining after 2020. So how will it be funded? The strategy is to create EOSC by federating existing and emerging scientific data infrastructure services in Europe – aggregating them using a System of Systems approach (as Wikipedia puts it). As such, it hopes to bring together projects that have been funded by different means. In addition, the EU has made €260 million directly available, again mainly it seems by using money already being spent on data infrastructures. It also anticipates that around 1% of future research funding could be made available for EOSC, presumably by channelling money

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[285] Its weakness of course was that it raised not unreasonable concerns about governments having control of publishing – concerns that were rehearsed recently on Twitter here.

[286] That said, the then CEO of Springer Derk Haank expressed some discontent with the idea of EOSC when it was introduced at the meeting that resulted in the Amsterdam Call.

through Horizon Europe grants. In-kind funding is also expected to come from national governments (e.g. the German government has committed to provide €900 million for data projects). In addition, an EOSC Association has been formed to which universities can apply to join – on payment of an annual membership fee of €10,000.[287]

The technical challenge will be whether the EU can build out such a large system by means of federating multiple different infrastructure projects, not least whether these can be made to interoperate effectively. Five cluster projects are already in place but, as UCL's David Price points out, the "rules of engagement" have yet to be established. For the moment, therefore, it is not entirely clear how it will work in practice.

In terms of the social challenge we could note that participation in EOSC will be voluntary. The question here is whether universities and research institutions across Europe will be willing to co-operate in this way. More importantly, will they be willing to make their data open and to share it? Some worry about this being done without a clear plan on how intellectual property will be protected. (And remember Europe was sufficiently concerned about protecting data in 1999 that it introduced a unique Database Directive that gives a *sui generis* right for the creators of databases that do not qualify for protection under copyright laws).

Frans Oort, open science coordinator at the University of Amsterdam has warned: "If universities simply make their data generally available to everyone without any conditions, commercial entities could collect that data, enrich it and build services around the data, and then make universities pay to use those services."

We've heard such concerns before! But that is the model that the EU has embraced with its "Three Os" strategy.

Interestingly, there is also a proposal that the service be funded by charging commercial entities to access the data. This would certainly not be in the spirit of openness that the EU has been promoting, and certainly not what OA advocates might expect. But it makes sense.

In the end, however, the biggest challenge will likely be whether Europe can afford to create and efficiently manage the EOSC.

In the meantime, publishers like Elsevier have been developing products like the ICSR Lab. This offers researchers a cloud-based "computational platform" that includes access to some of Elsevier's data products *plus* the ability for users to upload and link their own or third-party datasets and interactively run and re-run code written in one of several programming languages. Here too we see how the oligopoly enjoys inherent advantages: Elsevier can preload the lab with its own data[288] in order to attract users. Currently that data is free, but researchers have to apply to use the service. I assume the plan is to experiment and learn from how researchers do use it to help in the development of both the lab and other new products and, at some point, to start charging usage fees for ICSR. Could it offer a better alternative to EOSC?

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[287] It is not clear to me why universities might want to pay this membership fee as it does not appear to bring any advantages.

[288] This it seems will include data from Scopus, PlumX Metrics and SciVal etc.

Perhaps the greatest challenge to EOSC, however, will come not from traditional scholarly publishing companies, but web giants like Amazon, Google, and Microsoft.

Q: Aside from predatory publishing, what are the potential consequences you see arising from the current situation – e.g. loss of funding, increasing APC costs etc.?

A: Yes, to both these things. As I say, the direction open access is currently moving in seems set to leave legacy publishers firmly in control. And while APC costs may be invisibilised in transformative agreements, the costs are nevertheless based on per-article charges (and, as noted, APC costs appear to be increasing in much the same way as subscription costs did). This suggests the issue of *affordability* is not going to go away, and we can expect to see the same concern about price inflation that we saw with the traditional subscription model. The serials crisis will be replaced by a pay-to-publish crisis – as we move from paywalls to playwalls.

What is further invisibilising costs is that funders have started contributing to the payment of APCs.[289] Again, this does not mean that cost issues go away, even if it eases pressure on library budgets. It also puts countries in the Global South at a significant disadvantage as funders in that part of the world do not generally pay APCs and in many cases may not be able to afford to.

And as I noted, if funders take on more responsibility for paying APCs it will inevitably mean that there will be less money available to actually pay for research to be done. If we take the figure of 2% discussed earlier and consider that percentage on a global basis, we are talking about a lot of money that will no longer be available to do research.[290]

From librarians' point of view, if some or all of the OA publishing costs are transferred to funders (and perhaps to other departments within universities), university administrators will surely seek to reduce library budgets commensurately. Libraries will, therefore, continue to see significant pressure on their budgets. And as subscriptions begin to give way to the new OA models, libraries' historic role in scholarly communication could start to dissipate, particularly if (like SUNY) they have not established OA subvention funds. In fact, it appears that subvention funds have been falling in both number and value in the US and Canada in recent years, after reaching a peak in 2014.

In short, libraries could find themselves side-lined. They will, of course, resist this. One way of doing so will be to argue that in order to monitor and manage OA costs institutions need to do it centrally – as the Swedish library consortium Bibsam has argued.[291]

The best way of managing costs centrally, they can be expected to argue, is by signing transformative agreements. Librarians will also be able to say that they have long experience

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[289] There are attempts to provide transparency, including the Open APC site, but this seems to be mainly a European effort and it cannot claim to have broad coverage.

[290] If you calculate 2% of the research spending of just the 90 countries in this list you get a sense of the costs.

[291] There clearly is a management problem – as explained in a Springer Nature white paper, which found that "Over a quarter of Springer Nature authors surveyed only used 'wild' funding sources for their APC. A further 50% combined a 'wild' APC source with funds from more easily monitored sources." In other words, currently institutions are not only struggling to manage and pay APCs, but they have no real fix on how much money is involved.

in negotiating and managing big deals, and so are the natural people to take on the role of negotiating and managing transformative agreements.[292] [293] [294]

Libraries will also look to create and manage OA journals within the library, or even take over the [management](#) of the [university press](#) (where there is one). In other words, librarians will seek ways to protect (and if possible, expand) both their budgets and their role in the scholarly communication process. But can library-based publishing prove any more successful than SPARC's early attempts to create new low-costs journals? The [experience](#) of both Pacific University and the [University of Alberta](#) (see **Page 138**) indicates that it is no easy task, especially given that library budgets are so vulnerable to budget cuts, cuts that will be even more likely in the post-pandemic environment.

And if transformative agreements transition to "bigger deals" and then for-profit publisher platforms and portals, the struggle to manage costs will increase rather than lessen.

Preprints

Q: Are there negative consequences of posting preprints? What are the positives?

A: As I said earlier, I believe that preprints can be problematic. But perhaps the first point to make is that, like open access itself, preprints raise delineation questions. I am not aware, for instance, that there is a [universally agreed](#) definition of what a preprint is or how it should be viewed and treated. Is it even a given that preprints are always available on an open access basis? There is also the issue of licensing to consider. OA advocates assumed preprints would always be made available on a CC BY basis, but a 2016 [survey](#) found that only 17.8% of bioRxiv papers had an "open licence" attached and nearly 30% had no licence at all. An analysis done this month suggests the situation has [worsened](#), and that [nearly all](#) the preprints on ChemRxiv are CC BY-NC-ND.

On the positive side, preprints allow research to be shared much faster, and in theory could speed up scientific progress (however one understands that). Potentially, therefore, preprints could be beneficial in the health fields and in fact this claim has been very strongly argued in the context of the [COVID-19](#) pandemic.[295] They could also help avoid research being duplicated, reduce publication bias, and allow researchers to assert priority for their ideas and research.

There are, however, downsides. For instance, the level of scrutiny that papers get before they are made freely available to the world on a preprint server is variable and in some cases (apparently) [non-existent](#).

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[292] Open access publishers apparently have similar views on this. PLOS CEO Alison Mudditt [said to me](#) earlier this year, "focusing on authors to play the cost management role is unrealistic – it makes far more sense for this to sit with libraries, who have the relevant skills and experience." Others will argue that the history of big deals suggests that librarians are not at all adept at negotiating with publishers.

[293] It is worth noting that UC has claimed that cancelling its contract with Elsevier has had little effect on the university. If true, we can expect the impact to grow over time as the number of papers published since UC cancelled grow. Interestingly, the claim has also led some to [suggest](#) that it means libraries have been paying publishers millions of dollars for years for a resource that has apparently brought little benefit!

[294] See also [this](#).

[295] The [same argument](#) has previously been used in the context of the Ebola and Zika epidemics.

Amongst other things, this means that drug and medical device companies could use preprint servers inappropriately. Attracted by the potential for, say, posting ghost-written "papers"[296] that talk up their products under the guise of reporting objective research, such companies could in effect treat preprint servers as marketing channels.[297] Papers like this have been dubbed "infomercials".[298]

Of course, insufficient scrutiny prior to publication can be an issue with peer reviewed papers too.[299] But I suspect faulty papers written with the intention of marketing products (e.g. drugs and medical devices) are more likely to be trapped during the traditional peer review process used by journals. In addition, by being published alongside genuine and sound research papers, a "marketing" preprint could acquire an unjustified patina of accreditation.[300]

The key point is that currently a preprint is unlikely to undergo adequate (if any) scrutiny by qualified professionals before being released to the world. This is clearly dangerous in some disciplines.

The undigested nature of preprints makes it more likely, for instance, that they will fuel rumours, conspiracy theories, and "infodemics". A controversial paper on COVID-19 posted on bioRxiv at the end of January, for instance, did just this,[301] leading to claims that the virus had been developed in a lab as a bioweapon (see also here).[302] Following criticism (including of the authors' interpretation of their own data) the paper was subsequently withdrawn.[303] The incident also led to bioRxiv posting a new banner cautioning readers that the papers on its site have not been reviewed.

Preprint enthusiasts argue that the rapid community response to the flaws in that paper, and its subsequent withdrawal, demonstrates that science is self-correcting, and that bad science is more quickly discovered and rejected on a preprint server than when published in a journal.

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[296] See also here.

[297] medRxiv does screen papers to see if there are any obvious problems before posting them, but this is not peer review and could not claim to be providing any kind of certification.

[298] Which is of course also possible in peer reviewed journals, especially a megajournal like PLOS ONE. See here, for instance.

[299] In June, for instance, both *The Lancet* and *The New England Journal of Medicine* (*NEJM*) retracted two high-profile papers after one of the authors declined to make the underlying data for both available for an independent audit after questions were raised about the research. But while OA advocates were keen to present this as an issue of subscription vs. open access the issue was really about transparency of data and the nature of the peer review that took place. *The Lancet* has subsequently changed its policy on this and now requires that more than one author on a paper must directly access and verify the data reported in the manuscript. As John Ioannidis put it, "Sensationalism affects even top scientific venues … Opinion-based peer-review may even solidify a literature of spurious statements."

[300] Consider also this envisaged role for preprint servers: "Small startup companies can use preprints to showcase their preclinical and early phase clinical studies to potential investors." Is this really what we want scholarly publishing to be about?

[301] Specifically group of researchers at the Indian Institutes of Technology posted on bioRxiv an analysis that purported to find an "uncanny similarity" between tiny segments of the virus' genes to sequences found in HIV — implying that new virus could be a laboratory-generated mutant. The authors posted a link to their paper on Twitter, and their claim gained attention globally.

[302] *The Conversation* reports that "until February 19 2020, the withdrawn paper was the most discussed study in the world in online news and social media, according to the academic ranking site Altmetric. The paper may have been withdrawn but it won't have been forgotten."

[303] Another paper claimed that Coronavirus may have started in a Chinese Lab where researchers were attacked by disease-ridden bats. The paper was subsequently removed from ResearchGate.

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But if one considers that preprint servers allow faulty or dangerous research to be made available to the world far more easily and widely, the argument may appear less persuasive. By the time the above preprint had been withdrawn, for instance, the conspiracy theory had been widely broadcast on social media and the paper had achieved the highest altmetric score of all time. Moreover, the withdrawal served to amplify the rumour in a kind of Streisand effect, further driving its dissemination. This point was made by a number of commentators on Twitter – e.g. here.[304]

In September a similar preprint was posted on the EU-funded platform Zenodo. This paper claimed that genetic evidence showed the SARS-CoV-2 coronavirus (i.e. the virus that causes the COVID-19 disease) was made in a lab, rather than emerging through natural spill over from animals. It later transpired that the report was funded by the Rule of Law Society, a non-profit organisation founded by the controversial former chief White House strategist Steve Bannon (who in August was arrested for fraud). The preprint was roundly condemned on Twitter (also here). Worryingly, however, it appears that Zenodo does not flag whether a paper posted on it has been reviewed or not, and there appears to be no comment feature on the service and no requirement to register any conflicts of interest. As such, anyone accessing the paper (which was approaching 1 million views and over 700,000 downloads when I last looked) will not know that there are serious concerns about it. (My questions to Zenodo on Twitter about this went unanswered, and it appears the platform has refused to take the preprint down, along with another suspect paper).

In another case, an editorial in the BMJ called "The perils of preprints" complained about two preprints posted on the Qeios platform. The papers were faulty, the editorial said, because the authors suggest that nicotine could play a role in blocking the virus (which claim saw the French government ban online sales of nicotine patches).[305] The editorial also alleged that Qeios does not warn readers that the content in preprints has not been peer reviewed and (at one time) did not mandate authors to disclose competing interests – both of which assertions were denied by Qeios. The editorial also claimed that one of the authors had historically had ties with the tobacco industry. Subsequently, one of the preprints was replaced with a new version. The confusion of having multiple versions of a preprint is problematic in itself.

It should also worry us that the majority of preprints never go on to be reviewed by anyone. Specifically, only 30% of preprints are later published in a journal. As such, huge numbers of preprints are likely to remain in an un-reviewed state for anyone in the world to view – potentially in perpetuity.

Writing for *Mother Jones*, Jackie Mogensen rightly pointed out that such incidents are part of a wider problem with scholarly communication. However, she added, the pandemic has drawn attention to it in a very public way, which is likely to reduce public trust in science.

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[304] As European Open Science Cloud puts it, "Open science is vital to tackling the world's big challenges. But the concept has not been as simple as making every research finding available to anyone for any purpose. When information can be misused, skewed, or misinterpreted at the global level so quickly, we also need scientists and the public to treat open science with great care and responsibility. Without care and responsibility, there is a danger that open science can contribute to the spread of misinformation."
[305] See also this.

The flood of COVID-19 preprints has also increased the firehose of papers the research community is having to grapple with, worsening the information overload that it faces today and exacerbating the *discoverability* problem.

Mogensen was undoubtedly right to say that this issue is not unique to preprint servers. The pandemic has seen dubious papers published in journals too, increasing the level of noise and wasted effort – a point made by the authors of a letter published in the *BMJ* in May. Ideally, in the middle of a pandemic the research community should be making even greater efforts to ensure that sound, useful, clear, well-constructed, and well executed, research is undertaken. But this is not what we have seen in many cases.

The role the media plays in the dissemination of faulty research posted on preprint servers is also worrying. As Mogensen puts it, "A little over half [of the COVID-related papers published to date[306]] were published on databases known as pre-print servers, meaning they haven't yet been formally reviewed; still, the media has picked up many of them before thorough vetting."

This point was echoed by Rita Redberg, a professor of medicine at the University of California, who told CNN: "I think the problem [with preprints] is – particularly if they're picked up in the media or on social media people post – that it's very hard for the public to separate an article that has undergone a rigorous peer review process from one that has not".[307]

Speaking to EMBO Press, Ralph Baric, a virologist at the University of North Carolina, Chapel Hill, was more forthright: "I think it is a disaster," he said. "I would get rid of these things [preprint servers] if I had my way."

Baric, explained EMBO Press, "worries that it is an ideal format to put out fake information. 'Because the instrument has been widely accepted by the scientific community, that work immediately becomes credible'."

If such critics are right, then preprint servers might be seen to challenge one of the fundamental tenets of OA – that the public has a right to have access to the fruits of the research their tax dollars have paid for. If open access preprints can have the negative consequences we have seen that argument begins to look less secure.[308]

Following further criticism and concerns about COVID-19 preprints, in mid-February bioRxiv announced that it would reject manuscripts posted to the server where they proposed possible coronavirus treatments based solely on computer modelling – a decision that

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[306] In a *NYT* article published on June 1st, Carl Zimmer reported, "The National Library of Medicine's database at the start of June contains over 17,000 published papers about the new coronavirus. A website called bioRxiv, which hosts studies that have yet to go through peer review, contains over 4,000 papers." The numbers have continued to rise since then. By June 3rd it was reported that the number of COVID-19 preprints had grown to 26,000, a number that has continued to climb. In November it was reported that 90,000 papers that mention the word COVID in their text have been published so far this year. I do not think this number includes preprints.

[307] Redberg is also editor-in-chief of the journal *JAMA Internal Medicine*.

[308] Not all OA advocates believe that it is essential to make research freely available to the public: Björn Brembs has said that public access is not strictly necessary. Open science, he added, is important in so far as scientists are able to scrutinise and check each other's work.

attracted a different kind of criticism. Either way, it seems that manuscripts that propose possible coronavirus treatments using computer modelling alone are now being rejected by bioRxiv.

I assume this is why bioRxiv began recommending that some of the papers sent to it should be submitted to a journal rather than posted on a preprint server. This would seem to be an acknowledgement that some papers ought never to be made publicly available until they have undergone traditional peer review and so challenges one of the tenets of the preprint movement. Consider also the responses to this Twitter request for information about preprints that have been rejected by bioRxiv.

To further confuse the situation, in June MIT Press announced that it was launching a new journal called *Rapid Reviews* to "publish reviews of preprints related to COVID-19, in an effort to quickly and authoritatively call out misinformation as well as highlight important, credible research."[309] These reviews are not necessarily linked from the papers reviewed, so there is an obvious issue there.

In any case, the process sounds back to front. In light of the low quality of so many preprints, and the cautionary steps taken by bioRxiv, I cannot but think COVID-19 papers should be vetted before they are made freely available to the world rather than afterwards?[310] [311]

The likelihood is that over time preprint servers will have to give increasing scrutiny to papers before allowing them to be posted. As this will lengthen the time from submission to public release, we might wonder at what point the process becomes indistinguishable from traditional peer review.

Since this extra work will incur management costs, we can also expect preprint servers at some point to start levying submission fees. In fact, one server is already doing this. And in May arXiv was advertising a post for a temporary moderator to deal with the flood of preprints it has been receiving. Clearly this increased scrutiny will introduce new costs. At what point will preprint servers start to look and act as if they are just another gold OA journal? Once again, this might seem to challenge the *raison d'être* of the preprint server.

The recent kerfuffle over preprints has drawn attention to another kind of fracturing. Historically, the communication of science to the public has been mediated by science journalists, who select, interpret, and explain new research papers for a lay audience and put them in context in the process. With more and more preprints becoming freely available on the web (and newspapers employing fewer science journalists and/or reducing science coverage) this mediation process is degrading, and may partly explain why the media and social media has played such a worrying role in the dissemination of faulty science about COVID-19.

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[309] See also.

[310] This new journal has been presented as an overlay journal, an idea that was first mooted by arXiv founder Paul Ginsparg in 1996. But the original idea was to highlight papers of particular scientific value, not fake, erroneous or poor-quality research. I assume Ginsparg's assumption was that anything posted to a preprint server would be of intrinsic value but that some papers would be of more value than others and so should be formally published in order to highlight that value.

[311] One researchers has suggested that preprints are published only once the manuscript is under review by a journal, indicating that it has at least been screened and checked by an editor, and that it should be indicated in the preprint in which journal the paper has been submitted to.

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This is particularly dangerous in today's politically divided world, as was highlighted in an opinion piece published in the *NYT* in May. In discussing the controversial Ioannidis preprint[312] mentioned earlier the authors pointed out that the free availability of the preprint had enabled conservatives to exploit it for political purposes. Researchers sharing unreviewed research with one another is one thing, the authors said, but sharing such research with the world at large is another issue, and can provoke a "different reaction from another realm of our increasingly Balkanized internet."

Specifically, the authors added, the preprint received "a very different reception in the alternate universe occupied by the right-wing media" – who weaponised it for ideological purposes (to justify lifting the lockdowns). This would appear not to be an isolated incident. In September a paper published in *PLOS Biology* reported that, "10% of the preprints [we] analyzed have sizable (>5%) audience sectors that are associated with right-wing white nationalist communities. Although none of these preprints appear to intentionally espouse any right-wing extremist messages, cases exist in which extremist appropriation comprises more than 50% of the tweets referencing a given preprint."

A further danger highlighted in the *NYT* opinion piece is that when research is made freely available to the world and then retracted, or publicly questioned by other scientists, "the [public] scholarly debate can easily be cast as another attempt by elites to exercise a chokehold on an inconvenient truth." [313]

There must also be uncertainty about the long-term sustainability of preprint servers – as discussed on Twitter here.[314] Despite its popstar status, arXiv has not found it easy to fund itself over the years, not least because its costs have risen ineluctably over time.[315] As noted, today it requires $2.6 million a year to run,[316] with much of the funding raised by crowdsourcing. With further plans to enhance and expand the service, arXiv's costs can be expected to rise further going forward. And as the number of new preprint servers and scholar-led initiatives grows, so the pressure on community crowdfunding dollars will increase (especially after the pandemic) and funding will become more and more difficult to obtain.

My enquiries on Twitter as to the long-term funding strategy for bioRxiv and medRxiv, and whether there is a publicly-available budget, received no response.[317] A few weeks later it was announced that the Chan Zuckerberg Initiative had awarded $2 million in funding to support medRxiv. There must be questions as to whether such services can be sustainable in

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[312] A paper published by researchers at Manchester University made similar claims, suggesting that "over 25% of the UK likely to have had COVID-19 already". This too attracted criticism from other researchers.

[313] In other words, attempts to debunk fake news about epidemics can do more harm than good. This has been called the "tainted truth" effect. As *Scientific American* puts it, "the act of warning the public that previously learned information is inaccurate can increase skepticism about other disease-related knowledge – even if it is correct."

[314] See also this paywalled blog post.

[315] It is worth noting that in 2003, Suber said, "For archives, there is virtually nothing else to pay for once the taxpayers have paid for the research and writing of an article. The software for hosting an OA archive is open-source, the labor for installing it is negligible and donated, the server space is inexpensive and easily justified by the archive's benefits to the hosting institution, and the labor of uploading new content is distributed among the participating authors."

[316] This is over five times more than it was eight years ago (in 2012).

[317] See also this.

the long term if they are constantly having to go cap in hand to funders, whose priorities inevitably change over time.[318] And as one twitter user commented, the size of the grant to medRxiv highlights just how expensive building and maintaining scholarly infrastructure is.

The other point to make is that, like open access itself, many viewed preprint servers as alternatives to legacy publishers, as tools to help the research community "take back control". But we have seen legacy publishers increasingly acquiring these services – as happened, for instance, with SSRN, bepress, Mendeley, and most recently with F100Research – or building their own services.

In short, legacy publishers are now co-opting the preprint movement much as they co-opted open access.[319] As Schonfeld and Oya Rieger pointed out on *The Scholarly Kitchen*, "Publishers are integrating preprint deposit into their manuscript submission workflows, and adopting a common strategy designed to *take back control* of preprints." [My italics.]

This is the same model of the commercial exploitation of innovation produced by universities that I discussed above. And it suggests to me that over time many preprint servers may become no more than component parts of the workflow processes of legacy publishers. We are also seeing author services being built around these publisher-owned preprint servers – as described in this interview. The truth is that there appears to be no limit to the number of ways in which publishers can extract money from the research community!

If they are appropriated by publishers, preprint servers will be more sustainable, but they will not be playing the role envisaged for them when OA advocates started launching them.

Information wants to be free? Should be free? Ought to be free?

Having answered all the questions, I want to return to the "*information wants to be free*" motif that I have argued became embedded (if only unconsciously in some cases) in the open access narrative early on, as it did in the other open movements.[320] What exactly is meant by the expression? How do we interpret a statement that appears to give an inanimate thing human desires and wishes? Do we call it a personification? Is it anthropomorphism? Is it some form of pathetic fallacy? I assume that what is implied when the phrase is deployed – or discussion about *rival vs. non-rival goods* takes place – is that information "*ought to be free*."

The Wikipedia entry points out that the phrase is often used as a political statement to express the view that – due to its very nature – information *needs* to be free. Wikipedia adds: "Brand's attribution of will to an abstract human construct (information) has been adopted within a branch of the cyberpunk movement, whose members espouse a particular political viewpoint (anarchism). The construction of the statement takes its meaning beyond the simple judgmental observation, 'Information *should* be free' by acknowledging that the internal force or entelechy of information and knowledge makes it essentially incompatible with notions of proprietary software, copyrights, patents, subscription services, etc."

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[318] And there are reasons to be uncomfortable about scholarly publishing initiatives taking money from philanthrocapitalists like the Zuckerbergs.
[319] See also here and here and here.
[320] These include the open source and free software movements, plus the open content, open data, open science, open journalism movements etc. etc.

I am certainly not suggesting that OA advocates are anarchists, but it would seem that the "ideological stance" of many of them assumes that publicly funded information should not be subject to traditional notions of IP (as I think should be evident from what I have said throughout this document) and that some believe for-profit publishers should play no (or a very limited) role in scholarly communication. We certainly see open advocates arguing that copyright places artificial barriers around information that should by rights be able to flow freely through the network to the benefit of all.

However, even if one accepts this proposition, there is much to argue over, not least the costs associated with managing and distributing information. While sharing information in the form of an idea, a document, a presentation etc. with others in, say, a room or lecture hall, may not be a very costly process, collecting, accrediting, assembling and managing a large body of research information in an organised, structured and persistent way, and distributing it on demand over a global network, is by no means costless.

I have suggested that while OA advocates believe open access is ontologically an unmitigated good, I am not convinced. And I am saying here that when they use (or refer to) the phrase *information wants to be free* OA advocates are (consciously or unconsciously) adopting a certain ideological stance (to use the phrase of the OA advocate cited earlier) that, amongst other things, reflects an anti-business sentiment. What they are really objecting to, I suspect, are the neoliberal economic imperatives that everyone in the research community is a slave to today.[321] And that perhaps explains their animosity toward for-profit publishers, who they tend to assume are stealing their freely-given unpaid labour in order to enrich their shareholders (a point Moore makes in the quote I cited earlier).

In short, when OA advocates and librarians allude to Brand's phrase (or express sympathy for it) I believe they are rejecting academic neoliberalism, questioning whether for-profit organisations have any legitimate role to play in scholarly communication, and supporting the notion that the academic community needs to "take back control". The latter certainly seems to be the view of the OA Radicals, and it is presumably the view of those who insist that open access is not a business model but a moral and political imperative.

This takes us back to the OA dilemma: the fundamental problem advocates face is that the vision of the world articulated by BOAI is out of sync with the current zeitgeist of academia. Nor do the principles outlined at BOAI seem to be compatible with today's dominant neoliberal ideology, or the way in which governments and funders are implementing open access. As I have argued, the latter appear to view OA as a tool for advancing neoliberalism and promoting the narrow economic interests of countries and regions,[322] not for advancing the cause of global *equity*.

This dilemma is not unique to OA advocates: all open movements appear to be faced with the same predicament. They were all founded in the idealistic belief that, now that the internet has made it possible to share information in a near frictionless (but, I argue, not a costless) way, it can and must (because of its very nature, or entelechy, if you like) be openly and

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[321] For a sense of just how objectionable some researchers feel this to be one could do worse than listen to this Zoom conversation.

[322] Rather than saying this directly, funders and their spokespeople often say that open access will "speed up the progress of science". I suspect this is really shorthand for saying that open access will speed up the economy, increase GDP and improve the nation's/region's economic strength.

freely shared with the world. And it was assumed that this would usher in a better, more effective, and more equitable world. Openness is for them an unmitigated good.

Today, however, the various open and free movements are having to confront the reality that this is too simplistic a view, not least because the internet does not (and cannot) exist in a political and economic vacuum – notwithstanding the assertions of early internet pioneers like John Perry Barlow that it can and should.

In the case of open access, the assumption was that a well-intentioned, loosely organised movement calling on researchers and publishers to make research papers freely available online could (regardless of the wider political and economic realities) usher in a fairer, less costly and more effective scholarly communication system.

Today such assumptions look decidedly naïve. As the author of a post on *A bee with a blog* put it in January, "Our commitment to openness has foreclosed our imaginations. So long as the problem is defined as one of 'closure,' open projects will be blind to other politics, other ways of knowing and understanding how we organise, how we share power, and how we imagine our shared future."

Interestingly, in 2007 Creative Commons co-founder and open access advocate Larry Lessig concluded that the kind of openness he wanted could not be achieved without political change. To that end, he announced that he would cease lecturing on intellectual property, and spend less time on the Creative Commons, in order to devote his energies to battling what he called the corruption of the political process.

Lessig's specific point was that in order to prevent copyright laws being continuously extended, lengthened and broadened it would first be necessary to take on the political system, which he said was "so queered by the influence of money that it can't even get an issue as simple and clear as [copyright] term extension right."[323] Lessig founded Change Congress and even considered running for Congress – with the aim of passing an anti-corruption bill intended to reduce the influence of money.

Lessig failed in this and subsequently abandoned his bid for office, blaming the political system he had wanted to change.

Since then a new generation of open advocates has appeared on the stage and many are coming to a similar conclusion as the author of the post on *A bee with a blog* – i.e. that the free and open movements have had too narrow a focus. This has also seen growing disenchantment with the leaders of these movements, including Lessig, which came to a head last year when the controversy over the convicted child sex offender Jeffrey Epstein rippled through academia.

Specifically, it became apparent that some of the leaders of the open movements – along with leading scientists – had been happy to take money from Epstein without giving sufficient thought to the character of the man and his activities (with some even seeking to hide their relationship with him). Most visibly perhaps, we saw Joi Ito (then head of MIT's prestigious

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[323] As he put it, "I don't mean corruption in the simple sense of bribery. I mean 'corruption' in the sense that the system is so queered by the influence of money that it can't even get an issue as simple and clear as term extension right."

Media Lab and an [avid supporter](#) of both open source software and open access) forced to [resign](#) from MIT, Harvard and a number of other organisations as a result of having taken monetary gifts from Epstein.[324] I think we could say that "the influence of money" lay at the heart of the issue here.

Lessig got caught up in the controversy when he published a [blog post](#) supporting his friend Ito from [critics](#). In the post he seemed to be suggesting that it is ok for universities to take money from "people convicted of a crime or "people whose wealth comes from clearly wrongful or harmful or immoral behavior" so long as they take the money anonymously. As a result, Lessig himself became a target of criticism, which led to him [filing a defamation lawsuit](#) against the *NYT* over the way in which it had [reported](#) his views.[325]

Another to face criticism as a result of the Epstein controversy was the founder of the [Free Software Movement](#) [Richard Stallman](#), who made a number of [controversial statements](#) that led critics to accuse him of implying that sex with young women was not "sexual assault", and of condoning underage prostitution.[326] As a result, Stallman too was pressured to resign from MIT, as well as from the [Free Software Foundation](#), the organisation he had himself founded in 1985.

One of the things the Epstein incident drew attention to, [suggested](#) Steven Levy in *Wired*, was "a simmering resentment about the treatment of women by the scruffy brainiacs who built our digital world, as well as the Brahmins of academia and business who benefited from the hackers' effort."

What is clear is that a powerful sense has emerged among younger activists that the open and free movements, and their leaders, have been blind to more important issues, and that these issues cannot be addressed by greater openness alone.

The *A bee with a blog* post (entitled "[Open is cancelled](#)") argued that the leaders of the free and open movements have proven themselves to be morally bankrupt, and that, "Copyright and software licences have failed to control bad actors and to support marginalised creators."

The post continued: "It's time to build a new movement, one fit for an era of rising fascism and climate justice … The atrocious behaviour and words of men like Lessig and Joi and Stallman shouldn't be understood as the one-off failures of specific men, but rather as a reflection of deeper flaws in the underlying philosophy behind open."

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[324] Wikipedia reports that in 2019, revelations of Ito's connections with Jeffrey Epstein shed light on the extent of monetary gifts from Epstein to the Media Lab and Ito's startups outside of MIT. "Ito wrote an apology for the same but refused to resign, which led to the departure of several prominent Media Lab members, including Ethan Zuckerman, director of the MIT's Center for Civic Media, and Media Lab visiting scholar J. Nathan Matias. Subsequently, Ito resigned as director of the Media Lab and as an MIT professor shortly after at *New Yorker* [article](#). *The New York Times* [reported](#) that Ito resigned from Harvard.

[325] The *NYT* subsequently [changed](#) the offending part of the article and Lessig [dropped](#) his law suit.

[326] Wikipedia [reports](#) that in September 2019 Richard Stallman, the founder of the free software movement, resigned from both MIT and the Free Software Foundation following his posts on an internal MIT CSAIL listserv about Jeffrey Epstein's relationship with deceased MIT professor Marvin Minsky. "In response to Virginia Giuffre's deposition that Epstein had directed her, as a minor, to have sex with Minsky, Stallman suggested that the most plausible scenario was that Epstein coerced her to present herself as willing."

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What is needed, the post suggested, is not "open science" but "justice-oriented science". Clearly there is a connection here with the rise of the [Social Justice movement](#).[327]

Commenting on the post in February, OA advocate [Rebecca Willén](#) [said](#), "It is time to accept that we already are two separate movements: open/replicable scientists who want to include identity politics and social justice in the work for increased openness or replicability, and open/replicable scientists who don't."

Here we see further evidence of the way in which open movements tend to fracture and "[fork](#)". Unfortunately, this makes it easier and more likely for them to be subverted and/or appropriated by companies and governments. This in turn makes them susceptible to neoliberal capture.[328] A recent [article](#) in [PNAS](#) drew attention to this new fracturing saying, "open science and reproducibility literatures are emerging relatively independently with few common papers or authors. Open science has a more collaborative structure and includes more explicit language reflecting communality and prosociality than does reproducibility."

Or as Indiana University cognitive scientist [Richard Shiffrin](#) [suggested](#) when commenting on the article, "There are two quite distinct cultures, one more inclusive, that promotes transparency of reporting and open science, and another, less inclusive, that promotes reproducibility as a remedy to the current practice of science."

In short, a strong sense has emerged that the free and open movements have not only lost their way but that they were built on an erroneous premise. While *A bee with a blog* does not say so, we might want to suggest that the deeper problem is that the aspirations of the free and open movements may not be realisable in a neoliberal world, a world in which everything is assumed to be monetisable, and legal and political decisions are too often "queered by the influence of money."[329]

If I am right to argue that the economic and political orthodoxies of the day are incompatible with the BOAI goals, OA advocates might seem to have been destined to disappointment from day one. Certainly, the concessions the movement has made to neoliberalism have served to subvert it – as [Simon Batterbury](#) implies [here](#).

Increasing despair about academic neoliberalism seems evident across the entire research community today. In many cases, however, it seems to coexist with a sense of resignation and powerlessness. The [Zoom conversation](#) I referenced in a footnote earlier in this document certainly suggests to me that researchers don't believe the status quo can currently be challenged.

One very real obstacle here is that neoliberalism is as good as hardwired into mainstream political thinking today. As I said, I believe we are all trapped in a brutal and monstrous machine in which it is assumed that anything and everything can and should be monetised and made subject to market forces, including all that happens in universities and the research

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[327] I would note that some believe the Social Justice Movement is [problematic](#) in itself.

[328] As one small example in the open source space we saw recently the [resignation](#) of the CEO of Open Technology Fund in response to his lobbying efforts intended to push the group's funds toward closed-source tools rather than the open-source ones it has traditionally championed.

[329] In their book *Cynical Theories*, Pluckrose and Lindsay argue that those writing on ableism often complain that the neoliberal system forces people to be "fully autonomous, high-functioning individuals so that they can contribute their labour to capitalist markets."

community, not least scholarly publishing. The sense of powerlessness I detect is in part because left and centre political thinking currently has no coherent and viable intellectual framework to offer as an alternative, particularly in the realm of economics – a truth revealed in the wake of the 2008 financial crisis. As journalist George Monbiot put it in 2016, "When neoliberalism fell apart in 2008 there was ... nothing. This is why the zombie walks. The left and centre have produced no new general framework of economic thought for 80 years."[330]

This suggests to me that it would require a lot of intellectual effort and regrouping by those who inhabit the left and centre political space to be able to offer a viable and believable alternative to the dominant political narrative. This currently seems unlikely, not least because of the ascendance of identity politics (or the "politics of recognition"), which tends to cause most political discussions to divide rather than unite people.[331] The Social Justice movement may be too fissiparous to allow effective political change to take place, certainly in terms of the economic management of societies. (But I don't claim to be an expert in such matters).

For their part, I think OA advocates would need to engage in a great deal more introspection (with a heightened sense of the historical moment) than most have demonstrated to date – as the book I cited earlier ("Open Access in Theory and Practice") might seem to suggest.

That said, increasing dissatisfaction with the way in which open access is developing has led to a number of new proposals and statements recently calling for a different approach. In July, for instance, we saw publication of the Open Access Manifesto for Freedom, Integrity, and Creativity in the Humanities and Interpretive Social Sciences." (Of which Simon Batterbury is a co-author). Amongst other things, this calls for "the commonification of open access".[332]

Elsewhere, five humanities journals have published a statement bemoaning the fact that "the dominant model of open access is dominated by commercial values" and calling for "replacing the values of efficiency, transparency and compliance with those of equality, diversity, solidarity, care and inclusion."[333]

Both these interventions seem to reflect a desire to place greater stress on social justice and *equity* in the narrative of openness and the practice of OA policies. Again, however, it is generally HSS researchers who are making these calls and publishing these statements – a reminder (amongst other things) that, contrary to the belief and actions of funders, HSS disciplines operate differently to STEM. I believe these disciplines are also much more attuned to issues of social justice and *equity*. Unfortunately, HSS is viewed by governments and funders as the poor cousin of the research community today, not least because its

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[330] What emerged instead, Tariq Ali has argued, is the "Extreme Centre".

[331] One could perhaps argue that the Social Justice movement is the new left, but it is not a left able to offer an effective metanarrative for economic or political change.

[332] Extract: "We fervently believe that OA can be a powerful tool to advance the ends of civil society and social movements. But opening up the products of our scholarship without questioning **how this is done, who stands to profit from it**, **what model of scholarship is being normalised, and who stands to be silenced by this process** may come at a particularly high cost for scholars in the humanities and social sciences."

[333] Extract: "We recognize that the choice we face is not between open and closed access, since these are coterminous, but between publishing practices that either threaten or promote justice."

research is viewed as less "monetisable" than STEM research. (Which is ironic when one learns that HSS could be said to help subsidise STEM activities in universities).[334]

The challenge here, of course, is that statements, calls, manifestos, and declarations are not enough to change the world and, as we saw with the BOAI Statement, they are susceptible to being appropriated and subverted.

I wish those advocating for new approaches the very best of luck. But demands that governments provide funding for scholar-led initiatives so that the research community can "take back control" tend to fall on deaf ears today. Either way, for the moment politicians and purse holders do not seem amenable to rethinking their neoliberal approach to open access, to scholarly communication, or to the management of research and universities. That is not to say that these initiatives won't carve out a niche role for themselves, just that I don't see them attracting the necessary funding and mindshare to allow them "to propagate a model of fee-free OA worldwide at scale", in the way the founders of OLH had hoped.

The most that seems to be on offer from governments at the moment are gestures. When announcing that the Open Science Committee of the French government had provided some funding for open infrastructure projects, Vanessa Proudman Director of SPARC Europe (and member of the SCOSS Board) noted: "While this latest contribution is incredibly positive, the scope of this undertaking – securing our Open infrastructure – requires many others to follow in their footsteps."[335] Aye, there's the rub.

I have argued that the fundamental error the OA movement made was to assume that its aspirations could be accommodated to academic neoliberalism. This is a lesson that all left-leaning political groups are having to grapple with today. As the American political theorist and professor in Political Science Jodi Dean has pointed out: "Labor's defeat and the subsequent dismantling of the welfare state should have demonstrated once and for all the bankruptcy of a strategy requiring compromise with capitalist exploitation."

Perhaps this was Lessig's error too: to assume that the open and free movements could free themselves from the influence of money without first defeating neoliberalism. Either way, he did not succeed.

For all that, it is promising that we are seeing a new realism emerge within the OA movement today (here, here and here for instance). Commenting on the last article linked, Eve listed what he saw as the take away points:

1. "OA is not enough to dismantle the worldwide systems of exclusionary prestige that exist in academia and research.

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[334] As this article puts it, "Currently, a university loses money for every UK science, engineering, or medicine student it teaches, and makes a small surplus on humanities and social sciences students. Research loses money, and the more research a university does the more it loses."

[335] It is worth asking what is meant by OA infrastructure. In 2015, UNESCO talked in terms of repositories, OA journals and journal publishing software. The initiatives being supported today by crowdfunding initiatives like SCOSS seem often to be more directories and support services. This might appear to be more in line with what might be meant by the term infrastructure, but some of these services are as likely to support for-profit publishers (including legacy publishers) as non-profit.

2. OA as an *accessibility* issue can fix a narrow set of access conditions for an export of scholarship from the Global North (problematic term) but it will not fix global participation or mutual respect issues.

3. The 'Democratisation Myth' that OA will fix the aforementioned points (a myth) is the real problem. It is an overreach that appears to address global exclusion and/or inequality but does not modify the fundamental parameters of the system."

Eve concluded: "The argument that I am left with is that we simply have to scale back our hopes for what OA will do on its own."[336]

Consider also the summary and recommendations of the 14th Annual Berlin Debate on Science and Science Policy held last November (text in footnote).[337]

The new realism, however, seems inevitably to require a dialling down of expectations, as Eve concedes. This implies to me that OA advocates are left with the following options today: to compromise with neoliberalism (and abandon at least two of the BOAI goals); to scale back their aspirations and focus on niche scholar-led, commonification and justice-oriented initiatives in the hope that they might be able to subsist alongside the dominant system, and at least ameliorate the worst aspects of academic neoliberalism; to continue shouting into the wind; or – as Stevan Harnad did in 2016 – to abandon the movement altogether and devote their energies to a better cause.

There is no alternative?

In other words, Margaret Thatcher's assertion that "there is no alternative" to a neoliberal market economy (and the ever more oppressive and extractive business models and work environments that come with it), currently seems to stand. And neoliberalism, let's remember, generally views information as an asset to be leveraged, marketised, and monetised, by any means possible. It is a philosophy that talks the language of patents, trade secrets and copyright, and it implies a world of subscriptions, paywalls, and the licensing of information and ideas.

And when today governments and funders insist that research, data and innovation developed using public money should be freely shared, the goal does not appear to be to facilitate greater global *equity*, but to feed the maw of for-profit organisations in the expectation that if they are free to commercialise research they will advance the narrow economic interests of a country or region.

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[336] Eve has been more reflective, analytical and self-critical than most OA advocates. In his new co-edited book *Reassembling Scholarly Communications | Histories, Infrastructures, and Global Politics of Open Access* he continues to encourage self-reflection within the movement. "None of the chapters herein yields a conclusive historical or future direction but each frames, either through a theoretical lens or empirical engagement, an apparatus with which we can begin to understand the present moment for scholarly communications beyond a merely instrumental orientation."

[337] The report says: "The advent of 'open science', and widespread efforts to extend it, raise a host of technical and social issues. The fine details of publication practices, evolving alongside changing technologies, preoccupy many. These passionate discussions about 'open access', however, can obscure many other aspects of open science, and divert attention from the fundamentals: why is it the way to go, and what benefits should it bring?"

Neoliberalism is a philosophy in which notions of *cooperation*, *collaboration* and *sharing* are viewed in a somewhat different light to the way BOAI envisaged them.[338]

Those OA advocates who sang the neoliberal song in order to get governments' attention, and who lobbied funders to force OA on their colleagues, might perhaps regret having done so today. They failed to see that the three BOAI goals are not compatible with academic neoliberalism or the current political environment. It is unfortunate that this may not have been immediately apparent because funders and legacy publishers were able to cite the BOAI (and sister-initiatives like the Berlin Declaration[339]), and the demands of OA advocates, to justify the way in which they were retrofitting open access for neoliberalism.

The upshot is that the two most important goals of BOAI have been as good as discarded along the road. Given that the OA movement believed open access would not only solve the *accessibility* problem but also lower costs and create a fairer, more diverse and more democratic research environment this is particularly regrettable. Today open access looks set to be no less expensive and no more equitable than the traditional subscription model.[340] That is the dilemma all OA advocates now face, and that is why I believe it is reasonable to talk of the movement in terms of homogeneity. As a group they all (I assume) support the three BOAI goals and they all now face the same predicament.[341]

That they no longer have the ability to control their own movement must be particularly frustrating for OA advocates. And that perhaps is why the radical wing of the OA movement is now inclined to argue that there is "much more" to open access than the BOAI.

Even more depressing for OA advocates is the fact that the geopolitical environment is deteriorating, and we could see a splinternet that would make solving the *accessibility* problem difficult, if not impossible, too. That would surely make the whole OA project seem somewhat moot. We may at some point in the future have to conclude that the large sums of money that have been spent on OA were spent unwisely. And OA advocates may have to conclude that they have been chasing a will-o'-the-wisp, led astray by a misunderstanding of what is possible on the internet, practically, economically and politically.

In thinking about *equity*, it is worth noting that one of the most high profile funders advocating for open access today – the Gates Foundation – says on its web site that it introduced its open access policy because "The free, immediate, and unrestricted access to

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[338] This tension has been made manifest in discussions over how a COVID-19 vaccine will be made available and the concern by pharmaceutical companies that their IP (patents) will be wrested from them after they have spent a lot of money developing a solution. As this article concludes, "Each of the [pharma] CEOs expressed concerns about the rising tension over access. 'The reality is governments will try to leverage all the influence they have to get access, and we will be caught in the middle,' [Pfizer CEO Albert Bourla] said."

[339] In fact, by the time the Berlin and Bethesda declarations emerged (two years after BOAI) the notion that OA would lead to greater *equity* had begun to fade. The Berlin Declaration says little more about *equity* than what is implied in this: "Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society." The Bethesda Declaration, by contrast, talks of wanting to, "maximize the access and benefit to scientists, scholars and the public throughout the world". But by now it was being acknowledged that authors would likely have to pay "page charges" (read, "pay-to-publish gold OA") for this to happen.

[340] It is worth noting that publishers have been offering those in the Global South free or low cost access to subscription journals via the Research4Life programme for some years now.

[341] I am assuming there are no neoliberal OA advocates. But I could be wrong. Apologies if I am.

research will accelerate innovation, helping to reduce global inequity and empower the world's poorest people to transform their own lives."

Gates also prides itself on being one of one of the first funders to insist that all the research it pays for must be made immediately *freely available* and with a CC BY licence attached.

Yet elsewhere we are told that the Gates Foundation "has been a strong and consistent supporter of intellectual property rights, including for the pharmaceutical companies with which it works closely. These patent protections are widely criticized for making lifesaving drugs prohibitively expensive, particularly in the developing world."

Like a number of other private supporters of open access – including the Chan Zuckerberg Initiative and Soros' Open Society Foundations – the Gates Foundation is an example of "philanthrocapitalism" (see also). Philanthrocapitalism is a twin sister to neoliberalism and viewed by many as a way for billionaires to try and fix problems they and their companies created (and to get credit for doing so while retaining most of their wealth). Some also worry that philanthrocapitalism is seeing "the transfer of responsibility for public goods and services from democratic institutions to the wealthy, to be administered by an executive class" – i.e. that it is creating a "CEO society". Whatever one's views on this, the organisations these wealthy individuals founded and funded have played an important part in directing the development of open access.

We can see similar ambiguity and mixed messaging in the academic community, which must surely create a somewhat schizophrenic environment for those working in it.[342] Consider, for instance, that over the past several years the three universities most active in promoting open access in the US – the University of California, Harvard and MIT – have been locked in a patent dispute with one another over gene and genome editing systems based on CRISPR.[343]

The pandemic has served to create ambiguity about academic intellectual property in other ways, with the instinctive proprietary mindset of neoliberalism bumping up against the notions of openness and sharing promulgated by the free and open movements. For instance, the huge growth in online teaching that COVID-19 has necessitated is seeing some universities seek anew to assert ownership of the intellectual property generated by their faculty. Instead of seeing this as an opportunity to share academic knowledge with the world in the spirit of MIT's 2002 OpenCourseWare initiative, some appear intent on using the crisis to increase control over faculty and their intellectual output. I assume it is being done in the hope of monetising that IP, although it may just be a power play by university administrators. In August, it was reported that Youngstown State University was seeking to acquire ownership of faculty textbooks, articles and other nonpatentable works, including lectures and syllabi.[344]

Commenting on the news, Chris Sprigman, a professor specialising in copyright law and intellectual property at New York University, suggested to *Inside Higher Ed* that if institutions start to assert ownership over their own faculty's articles it could upset the trend

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[342] See also this.

[343] In fact, while CRISPR patents will surely prove extremely valuable, most patents obtained by universities are of little value and the bureaucratic cost of applying for and managing them often outweigh any financial return.

[344] This seems to be in contrast with Cambridge University's policy.

toward open-access publishing, with colleges and universities cutting deals with academic publishers and thinking "more like copyright owners and less like stewards of knowledge."

It is hard not to conclude that at heart the zeitgeist of the 21st university is still one of raw competition, proprietary interests and knowledge monetisation, not of *cooperation*, *collaboration* and *sharing*.[345]

Power laws and network effects

In thinking about the future of scholarly communication, we might want to reflect on an important characteristic of the networked world in which that communication is increasingly taking place. As discussed, open movements believed the internet was a democratic force and that it would create a flat earth in which anyone's voice was as equal, visible, and valuable, as anybody else's. This, it was held, would usher in a new age in which knowledge would be universally and frictionlessly shared, and in an unprecedentedly equitable way. Today we can see that this is not what has happened. Rather, as Jodi Dean points out, the internet is subject to undesirable and inequitable power laws and the "network effect."[346]

This is a world, says Dean, in which the most popular item generally has twice as many hits or links as the second most popular, which has twice as many as the third most "and so on down to the insignificant differences between those in the long tail of the distribution curve."

In a seminal 2004 article, the American writer on the social and economic effects of Internet technologies Clay Shirky explored online power laws in the context of blogs. "Though there are more new bloggers and more new readers every day," he explained, "most of the new readers are adding to the traffic of the top few blogs, while most new blogs are getting below average traffic, a gap that will grow as the weblog world does."

In practice this means that a limited number of blogs, web sites and social media platforms attract a hugely disproportionate share of internet traffic and have accrued the power that goes with that. Today, therefore, the web is effectively controlled by a few large companies. Moreover, what these sites offer are not open parks or commons but walled gardens operating on proprietary platforms. We have to wonder what this means for scholarly communication in today's academic culture, where researchers are obsessed with publishing in, or being associated with, prestigious journals owned by powerful publisher brands, particularly as those publishers create ever larger and more powerful online platforms and portals.

More perniciously, as noted the digital world has given rise to new business models that most now view as highly undesirable. Aside from issues of loss of privacy, attention extraction and surveillance, these models have created a world in which – while anyone can freely use web platforms to share information and take part in online conversations – their contributions are invariably captured and appropriated by the platform provider, in a process some call the third enclosure. This is not how open advocates envisaged the future when they started mouthing the *information wants to be free* mantra.

In the process, neoliberalism has morphed into a more noxious phenomenon dubbed "neofeudalism". Thus, internet platforms routinely appropriate not just the data exhaust that

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[345] See also this.
[346] As are altmetrics it seems.

users give off as they move around the web, but also the content they create in their interactions with others. That is, users (knowingly or unknowingly) freely contribute both usage data and content and web platforms then exploit it to sell advertising and to monetise it using various other extractivist techniques as well – as a form of capital accumulation. Neofeudalism is a product of the internet and reminds us again that openness is by no means an unmitigated good.

These models enrich the web platforms and the billionaires who own them in ways not previously possible. And it is a wealth, says Dean, created "on the basis of the cheap labour of their workers, the free labour of their users, and the tax breaks bestowed on them by cities desperate to attract jobs."

This "winner-takes-all and the more power you have the more you acquire, or winner-takes-most, effect is the power law shape of the distribution," she adds. "The shape the distribution takes is not a bell curve; it's a long tail – a few billionaires, a billion precarious workers."

At the same time, says Dean, our "phones, bikes, cars, and homes have lost their character as personal property and been transformed into means of production or means for the extraction of rent. Tethered to platforms owned by others, consumer items and means of life are now means for the platform owners' accumulation."[347]

This is neofeudalism, this is platform capitalism, this is data capitalism, this is extractivism, and it looks like it is coming to a scholarly publishing platform near you. What is striking is that the underlying model of neofeudalism could be said to have been prefigured in the way scholarly communication evolved after WWI. That is, commercial publishers like Robert Maxwell realised that it in order to make a lot of money from selling content you don't need to create it yourself, and you don't need to pay others to create it: the users of your services can be persuaded to provide it for free and you can then scoop it up and monetise it. What the web giants have demonstrated is that this model is far more powerful when utilised in an online environment. And as they build out ever more powerful and pervasive web-based platforms and portals, scholarly publishers can be expected to deploy this model in an equally predatory way as the web platforms.

And since this is a world of bigger is always better than big, we can surely expect to see a new period of consolidation in the scholarly communication space[348] – unless governments intervene.

Will governments intervene in this brave new world of platform capitalism? Certainly we have seen the CEOs of the web giants being publicly grilled by congress (also here) and we have seen calls for them to be broken up.[349] In October the US Justice Department could be said to have fired the starting pistol for this when it launched an antitrust suit against Google (with action against Facebook expected soon as well).

However, it is not clear that US antitrust laws are currently up to the job. The process is also very political and – to use the words of Lessig – "queered by the influence of money." As such, it is susceptible to the swings and roundabouts of politics. At one time, for instance,

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[347] As the saying goes, if the product is free then you are probably the product.
[348] A development that some publishing consultants are impatient to see.
[349] See also this and this.

there were plans to [break up](link) Microsoft. In the event, George W. Bush replaced Bill Clinton as US president and there was a settlement with the software giant.

Currently we are also seeing a head of steam building in Europe, as EU officials take on [Google](link), [Facebook](link),[350] [Amazon](link) and [Apple](link) *et al.*, including by introducing [new laws](link) intended to reduce their power and limit and contain their negative effects. A [key plank](link) in this is expected to be the upcoming Digital Services Act ([DSA](link)) with Commission officials said to have as their overarching regulatory goal "to limit the market power held by LoPs [large online platforms] acting as 'gatekeepers'."[351] Essentially, this means US corporate tech champions and their business models. The most obvious targets will be companies like Google, Amazon, Facebook, and Apple. But might it include oligopolist scholarly publishers too?

In the UK, meanwhile, it has been concluded that existing competition law remedies are insufficient to regulate the major online platforms and that new ones need to be devised.[352] [353]

But *will* scholarly publishers be in the purview of such initiatives? Compared to the web giants, of course, they are minnows, and it might be felt that antitrust measures are neither relevant nor necessary here. But I believe this would be a mistaken view. Issues of market concentration and pricing aside, it is worth reflecting on Sarah de Rijcke's concern that "bigger deals" could enable private companies to leverage big data and data analytics in ways that would give them undue influence, if not a worrying degree of control, over national and regional science policies – moving us further in the direction of a CEO Society perhaps?

Currently, however, I see little or no evidence that the US is interested in clipping the wings of scholarly publishers. The last occasion I am aware of was in 2001, when the Department of Justice [insisted](link) that the Thomson Corporation divest itself of certain property rights in college textbooks and a computer-based testing business that it had acquired from Reed Elsevier following Elsevier's acquisition of Harcourt the year before.

The EU has for some years now taken a more robust approach to taking on large corporations it feels to be abusing their market power than the US. However, it too seems currently to have little or no interest in the scholarly publishing market.

One reason why Europe might be reluctant to take action is that the two largest scholarly publishers are European (i.e. the [Dutch-based](link) Elsevier and the [German-based](link) Springer Nature). Where the EU has taken action it has often been against US companies, and one might be forgiven for thinking that this has been motivated by national/regional protectionism as much as concern over monopoly power and competition. Add to this the EU's obsession with having "competitive geopolitical influence" (to quote Schonfeld) and what I take to be a belief that in order to become a leader in key areas of science, Europe needs scholarly publishers to help it pursue its open science agenda and it might seem unlikely the EU will

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[350] Not always [very successfully](link).

[351] Large online platforms is a term the Commission has yet to define.

[352] In July the UK Competition and Markets Authority [concluded](link) that existing competition law tools are not sufficient to regulate the major online platforms, such as Google (cited 167 times in the study) and Facebook (cited 37 times) and called on the Government to establish a pro-competition regulatory regime for online platforms, by creating a Digital Markets Unit (DMU)." In November the government [confirmed](link) it was setting up the DMU, which will be part of the Competition and Markets Authority (CMA), to start work in April 2021.

[353] See also [here](link) and [here](link).

interfere in the scholarly publishing market. Essentially, the EU might be loath to crimp local companies who it believes are important to its strategic goals and who, by the way, also employ a lot of Europeans and deliver taxable foreign earnings. As Willetts said of UK science publishing in 2012, "our journals are an important export industry, with perhaps 80% of their revenues coming from sales abroad."[354]

More worryingly, it might be that the EU does not sufficiently understand today's scholarly publishing market and how it is likely to develop. It may also be blind to the fact that its attempts to force a transition to open access seem likely to exacerbate the situation.

That might at least seem to be a reasonable conclusion to reach based on the response of the EU's Directorate General for Competition to a complaint it received in 2018 from two OA advocates. Specifically, Björn Brembs and Jon Tennant complained about what they called, "the anti-competitive practices of RELX Group." The one-page reply they received said that "various regulatory and other initiatives may be better placed than competition law to tackle the issues you have identified in the sector of scientific publishing". This was a disappointing response by any measure. It might not have helped, perhaps, that the complaint could have been construed as targeting a single company.[355]

The EU letter added that the push for open access in Europe and the launch of the European Open Science Cloud, would help address the issues raised. So too, it said, would initiatives like Plan S and the way in which funding institutions are now organising themselves into groups and consortia "in order to increase their negotiating power when contracting with publishers." This might seem an unfounded assertion given that consortia have been negotiating with publishers for many years, with little improvement to the problems raised by the two OA advocates, or a resolution of the *affordability* problem.

For this and the other reasons outlined in this document I am far from reassured by the EU's response. Moreover, the recent deal between Dutch funders and Elsevier – and the failure of the negotiators to wait until their own taskforce had drawn up guidelines for the deal – suggests to me that funders are no more likely to leverage their negotiating power, or give sufficient thought to what they are signing up to, than multitudes of libraries have done over the past 20 years or so when signing big deals. In short, I think we should be concerned about the apparent unwillingness of the competition authorities to intervene in the scholarly publishing market.

It is worth noting here that when Reed Elsevier acquired Harcourt in 2001 there was a referral to the UK Competition Commission. While the acquisition was subsequently cleared (as it was in the US), the Competition Commission recommended that the Director General of Fair Trading (OFT) consider a wider review of the market. This the OFT did, and in 2002 it concluded "there is evidence that the market for STM journals may not be working well". However, the OFT decided to take no further action at that time, on the grounds that it believed "academic communities potentially have strong countervailing power." In support of this claim the OFT cited the PLOS Open Letter of 2000 – in which 34,000 scientists had threatened to boycott publishers who did not "agree to grant unrestricted free distribution

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[354] For a time after the companies merged Reed and Elsevier were to an extent treated as separate companies – the London-based Reed International plc and the Netherlands-based Elsevier NV – and jointly managed by the respective Dutch and English management teams, with two CEOs.

[355] One of those researchers, Björn Brembs, has said that Elsevier was singled out "because it is an easy target".

rights to any and all original research reports that they have published, through PubMed Central and similar online public resources, within 6 months of their initial publication date." The OFT also noted that researchers were now able to "bypass traditional commercial publishers altogether".

However, it added, "if competition fails to improve, or should additional significant information come to light, we may consider further action."

18 years later it is quite evident that neither internet technologies nor the open access movement have provided academic communities with a countervailing power. Rather both are serving to increase publishers' power, not least as a result of governments and funders forcing open access on the research community. Yet nothing has ever been done by competition authorities to control that power or to regulate the market.

I have argued that governments and funders in Europe embraced open access not because they wanted to facilitate greater global *equity*,[356] or even perhaps to reduce the costs of scholarly publishing, but because they believe open access will boost their national and regional selfish economic interests. And I have suggested that the EU not only believes that legacy publishers will be important facilitators of this, but it is conscious that these companies provide national/regional tax revenues and local employment. But would the EU really be happy to see a small group of private companies acquire excessive influence over European science policy, including over what research is undertaken, how it is undertaken where and how it is published and how universities operate?

Maybe these matters do not concern the EU. Neoliberalism tends to "hollow out" states due to the tendency today to outsource more and more services and decisions that were historically the responsibility of the state to private companies. One could argue that the European Union is itself a product of this kind of hollowing out – in so far as it is a supranational organisation that is not directly elected. Indeed, the election of the EC president is regularly criticised for the undemocratic way in which it takes place. Perhaps with the EU we are not talking about a CEO Society but a "Technocratic Society."

Be that as it may, there appears to be some confused thinking in Europe. The EU now routinely boasts that it has taken a leadership role in open science and that this will provide the bloc with a competitive advantage. But one is bound to ask how making a nation's research papers and scientific data freely available to the world can provide a competitive advantage. Free rider issues aside, it seems a somewhat oxymoronic view of openness. How

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[356] Much as they may pay lip service to it.

133 Open access: *"Information wants to be free"*?

can competitive advantage be gained by giving away your assets?[357] I for one struggle to parse this assertion.[358] [359]

This sort of (to me at least) confused thinking also seems to be evident in a June report produced for the European Parliament's Policy Department for Economic, Scientific and Quality of Life Policies. Amongst other things, the report includes a proposal for what it calls a "European internet."

As it explains, "The EU should include an action plan for a digital cloud – a European Internet – in the DSA [Digital Services Act].[360] This European Cloud would foster a European digital ecosystem based on data and innovation. It would drive competition and set standards. Foreign web services could become part of such a digital ecosystem but must adhere to the rules and standards of the EU – such as democratic values, data protection, data accessibility, transparency and user friendliness. Technologically, it would require a top-level infrastructure, high-speed 5G or a 6G data network and a firewall. Setting up such a network would promote many European companies and therefore boost business and drive innovation. Like the Chinese firewall, this European internet would block off services that condone or support unlawful conduct from third party countries."

What is meant here by the term "European Internet" is not immediately apparent to me. Is it a reference to EOSC, is it a proposal for an EOSC+ or for something else? A further confusion here is that some European politicians appear to view EOSC as a new (alternative?) web.[361] By contrast, the EU tends to characterise it as network for sharing data,[362] or "enabling data sharing for the purpose of furthering scientific research."

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[357] I realise some open advocates argue that this indeed possible – and it was argued often in the wake of Chris Anderson's 2009 book, *Free: The Past and Future of a Radical Price*. But it is worth considering that the companies who have made most of "free" business models are those that are now being criticised for developing surveillance capitalism and attention extraction. In an ironic twist here, Anderson was widely criticised for plagiarising content from Wikipedia in order to write his book (without citing Wikipedia)!

[358] Here from the European Commission's *Final Report of the Open Science Policy Platform* is the circle that the EU is trying to square: "Open Science policies must be jointly developed together with IPR policies to ensure a working framework for all actors of the European research knowledge system and those outside the system who contribute and benefit from it. Open Science policies can boost the performance of both the European economy and global economy, while IPR ensures the added value falls within European boundaries when appropriate (i.e. without jeopardising the health of the global system). While reciprocity is an important enabler of global collaboration, it must also not present an obstacle for low-to-middle income countries (LMICs) to contribute, reuse and collaborate, within community agreed standards." How can IPR ensure that value falls within Europe if you attach a CC BY or CC 0 licence to your research? How can pay-to-publish OA not be a serious obstacle to LMICs? Can this circle be squared in today's geopolitical environment? I am sceptical.

[359] It is worth noting that China will, as Delta Think put it, "benefit greatly from open access" but that research institutions in that country do not have the necessary funds to pay for APCs. I assume this is another reason why Chinese researchers are being told that they will have in future to publish "one-third of representative articles in domestic Chinese journals."

[360] The EU is currently working on the DSA as an update to the existing E-Commerce Directive in order to "strengthen the Single Market for digital services and foster innovation and competitiveness of the European online environment." See also **Page 131**.

[361] Frédérique Vidal, French Minister of Higher Education, Research and Innovation has described the EOSC in this way: "In my opinion, this web will play the role that the World Wide Web Consortium (W3C) played 20 years ago."

[362] This document contains the word data 52 times and says, "the importance of data dissemination as a catalyst for economic growth, innovation and digitisation across all economic sectors, particularly for small and medium-sized enterprises (and start-ups) and for society as a whole."

Confusions aside, the report seems to suggest that splinternet thinking is emerging in Europe and this might seem to provide a wider context for Burgelman floating the idea of geo-specific open access last year. Either way, we must wonder what this has to do with open access as conceived by BOAI. Rather it seems to confirm that the EU views open access, open data and open science as tools to enable the neoliberal exploitation of publicly funded research. And here the goal is to provide European companies with a competitive advantage (and "boost business and drive innovation", as the EU report puts it), not to enhance global *equity*.[363] Again, I have to wonder where the advantage lies in giving these things away[364] although here the focus seems to be on sharing within European boundaries (plus other countries which Europe deems to share its economic and political values). Either way, it is different to the vision of BOAI.

I don't want to overegg the pudding, but the idea of a European internet seems to me reminiscent of the Soviet Union's decision to adopt a policy of "socialism in one country" following the defeat in 1917 –1923 of all the communist revolutions in Europe bar Russia. In this case, the aim might seem to be that of preserving neoliberalism from a) China's competing geopolitical ideology and economic model,[365] [366] b) the growing pressure for greater equity between North and South and possibly, c) the nationalistic trends that populism has given rise to in some countries. Let's call it Europe's strategy of "open access in one region" (or more accurately perhaps, its "open science in one region strategy"). Ironically, the proposal might itself seem to be motivated by nationalism/regionalism.

In any case, for Europe to suggest in one breath that the world needs universal open access so that everyone can participate in the global research endeavour on a level playing field, to the benefit of all; and in the next breath to say that only those countries who are willing to provide OA on terms set by Europe, or that share its values, can access its research or be admitted to its part of the internet, might seem to give the lie to any claim that open access is about *equity*.

We have seen a similar attempt to juggle openness with national interests in the US government's Office of Science and Technology Policy (OSTP), as it has sought to square the circle of "openness and transparency" with growing concern about "hidden diversions of research and/or resources that threaten US leadership in emerging science and technology."

Today it seems that the West is concerned about two new superpowers: China and the technology giants. Both are viewed as a growing threat.[367] But while Europe is now very focused on these two challenges it does not seem to appreciate that, in seeking to force open

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[363] As noted earlier, there in fact appears to be no real evidence that this works. See the penultimate paragraph here.

[364] I assume it is modelled on the concept of the Single Market, but that is about the free movement of goods, capital, services, and labour, with the aim of providing equal access to buy and sell across European countries, not giving away national assets.

[365] It is worth noting that the ACS once described open access as "socialised science" (See also here).

[366] See the comments that emerged at the Science|Business conference 'Industrial R&D: Europe First' reported on **P. 153.**

[367] As this report from last year puts it in talking about China: "[T]here is a growing appreciation in Europe that the balance of challenges and opportunities presented by China has shifted. In the last decade, China's economic power and political influence have grown with unprecedented scale and speed, reflecting its ambitions to become a leading global power … China has also increasingly become a strategic competitor for the EU while failing to reciprocate market access and maintain a level playing field."

access on the world in the way it is doing, it could end up creating a third threat: a new age of platform capitalism in science and scholarship. This would not only fail to achieve the BOAI goals, but it could see national science policies, and science itself, unduly influenced and steered by private companies. Europe has been [criticised](#) by the European Court of Auditors for having been too slow to take on the tech giants. Might it face the same criticism over scholarly publishers in a few years' time? Either way, Europe could be creating a rod for its own back with initiatives like Plan S.

For OA advocates the fundamental problem is that neoliberalism and scientific nationalism both view openness through a narrow economic lens in which the goal is to further national economic interests, not to provide greater *equity* in the world of science and scholarship. Amongst other things, it means that there is an assumption that universities and nations should be engaged in winner-takes-all competition with one another in a Darwinian battle for survival, not "free love" hippy-style sharing. This might seem to imply that the problem OA advocates face is really a political one more than a problem with scholarly communication.

As such, we might want to argue that achieving the BOAI goals requires political change rather than draconian open access policies and mandatory CC BY licensing. I have said that the other open movements face the same problem. Environmental groups like Extinction Rebellion ([XR](#)) might also seem to be facing the same challenge. After all, neoliberalism helped create the problems all these movements are seeking to tackle and could be said to be a serious obstacle to fixing them.

Might there be mileage in the various open movements (perhaps under the umbrella of the [Commons Movement](#)) combining forces with climate change activists to try to work for the economic and political changes that are necessary if all these movements are to achieve their goals? The [call](#) for the "commonifidation of open access" I referenced earlier suggests there are shared values. This might seem to have been confirmed by the fact that [David Bollier](#), a leading voice in the commons movement (and who frequently [writes](#) on climate change issues), [responded](#) enthusiastically to the call. The synergies between the open access, open science and climate change movements are there for all to see, and have been [highlighted](#) before (also [here](#)).

On an optimistic reading, one could argue that the shock of the pandemic, combined with today's much greater awareness of the threats posed by climate change, has made politicians and citizens more receptive to the need for the kind of changes all these movements want and need. News that BP has decided to mothball some of its fossil fuel discoveries in light of its expectation that the pandemic will affect the world's oil demand for the next 30 years, combined with its [aim](#) of becoming a net zero company by 2050 or sooner, indicates that a new awareness of the problems ahead is growing even amongst some of the capitalist corporations that were instrumental in wreaking havoc on the environment in the first place. China's attempt to take an international [lead](#) on climate change could also help shake the West out of its lethargy, as we might hope the election of Biden will do too. Could this trigger the political change that would be needed to achieve the goals of all these movements?

On a pessimistic reading, one could argue that, despite mounting evidence of the environmental disaster ahead of us, and a period of activism stretching back to the 1960s, environmental groups like [Greenpeace](#) and [Friends of the Earth](#) have struggled to make headway against the neoliberalism that caused much of the damage that they are concerned

about (and which it continues to inflict serious damage on the natural world). We can but hope, but my suspicion is that unless neoliberalism is defeated we cannot expect the goals of any of these movements to be achieved. As we saw, Lessig failed in his attempt to fix a system "queered by the influence of money" thirteen years ago.

Consider also that, despite expectations that the 2008 financial crisis would trigger significant political and economic change, 10 years after the crisis the *Wall Street Journal* had to conclude that inequality had grown rather than been reduced over the decade, and the world become a less fair place.[368]

Failing wider political and societal change could the research community create the necessary conditions to achieve the BOAI goals within the confines of its own world? Some believe it could. When in 2017 I questioned the likelihood, OA advocate Cameron Neylon responded by saying, "radical thinking can suggest useful incremental change *within* existing frameworks". A good example of this, he added, is OLH. As we have seen, OLH founder Martin Eve might not seem to agree with this. Would incremental change be sufficient in any case?

Thinking over the same issue recently *Triple C* editor Christian Fuchs said, "Capitalism is not just in its internal structural dynamic dialectical and antagonistic. Capitalism is also based on a dialectic of immanence and transcendence. The very structures that differentiate and reproduce capitalism also create potentials that undermine capitalism, emancipatory potentials."

He added, "Digital capitalism contains potentials that point beyond itself. In the realm of open access, we [do] not just find capitalist open access but also alternative, emancipatory, non-profit, non-capitalist potentials, projects, journals, books, publishers that are germs of future historic forms of publishing, the economy, and society. Digital capitalism is grounded in an antagonism between digital capital and the digital commons."

As an example, Fuchs cited Radical Open Access (of which *Triple C* is a member) which, he said, is as an attempt to "bring together projects that have an alternative vision for open access."

Nevertheless, Fuchs had to conclude that today's scholar-led "emancipatory" initiatives are "minority projects that face the power of capitalism and therefore often struggle to survive. The germs of the new do not automatically blossom into fully developed flowers. More often they wither away. There is no automatic development of the economy and society."

I think Fuch's conclusion is probably right. And perhaps the director of the Open Humanities Press and co-founder of the Radical Open Access Collective Gary Hall might agree. Commenting on a recent paper entitled, "The Workplace Commons: Towards Understanding Commoning within Work Relations" Hall noted that the paper "covers some of the issues involved in trying to create a commons in the context of working in an institution such as a university."

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[368] The brutal and perhaps insurmountable fact is that to fix the problems that neoliberalism has created will require not only the rich and powerful to give up money and power, but all of us to make big sacrifices. How willing are people to do this? This, of course, is another example of a collective action problem.

He added: "Spoiler alert: formally, you probably can't!"[369]

We might also wonder whether OLH is more of an outlier than the germ of a future historic form of publishing, both as a crowdfunding initiative and as diamond OA. As Rooryck has acknowledged, stable solutions for diamond are not yet available, "despite the excellent example of OLH."[370]

Rooryck added that scholar-led non-profit publishing operations are particularly challenged when it comes to funding. He explained: "The reason funders use Gold OA is simply because if fits seamlessly with the way they fund: OA publication costs can be a line item in the grant agreement, or they can be deducted article by article from a dedicated fund (as is the case at BMGF). Funders are reluctant to pay for the permanent infrastructure that diamond traditionally entails. They also hesitate to pay for infrastructure that is going to be used by researchers that are not in their national scope."

This last point reminds us again that concern about free riding is a recurring OA theme.[371]

Consider too that Pacific University started publishing diamond open access journals in 2011, and by last year had created 7 such journals. As a result of budgetary constraints, however, the number has since fallen back to just 3 journals, and the university appears to be trying to shed the rest.

Also noteworthy are some comments made about diamond OA by Sonya Betz, Head of Library Publishing and Digital Production Services at the University of Alberta. "Many (but not all) large commercial publishers provide copyediting, layout and design, and journal management services as part of their service offerings, funded through revenue collected by the publisher through subscriptions or APCs. Within our no-fee model, we simply cannot offer these services to the 70 journals that we publish and instead, we grudgingly off-load the problem to our editorial teams, who must immediately face this issue when they join our program. Finding revenue to fund some of the operational elements of their journal production, without resorting to subscriptions or APCs, is a constant pain point for all of us."

This reminds us again that funding scholarly communication outside of a for-profit framework is hugely challenging and very fragile in the Global North (and increasingly threatened in the Global South as a result of the OA policies being introduced in the North).

It has also become clear that the internet's promise of enabling widespread and routine sharing and co-production in a mutual and reciprocal way outside of any commercial nexus

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[369] In a recent book chapter David Bollier concluded, "The future impact of legal hacks in empowering commons and transforming state power remains an open question. Much will depend upon the beleaguered fortunes of the market/state system in the years ahead as well as on the tenacity of commoners in pressing for new modes of governance and provisioning."

[370] Earlier this year the founders of the Open Library of Humanities conceded, "It is easy at this stage in an organisation's lifecycle to sit back and celebrate accomplishments. Yet we have not yet achieved our mission: to propagate a model of fee-free OA worldwide at scale. We have shown it can work. However, if libraries cancel and we cannot persuade new libraries to sign up, the faith in our model may dwindle over time and APCs could win out." As noted, OLH currently uses a crowdfunding approach.

[371] Note as well the response of the Gates Foundation's Ashley Farley to the suggestion that its publishing platform be made available to non-fundees: "What would be the main benefit of that? Subsidizing publishing costs for non-grantees?" We have also seen concern expressed that the new European platform will only accept papers from Horizon grantees, which was said to be unfair.

has not blossomed beyond the world of scholarly communication either. As Benjamin Mako Hill and Aaron Shaw put it earlier this year when taking stock of Wikipedia as it reaches its 20th anniversary: "Mass collaboration and distributed knowledge sharing on the Internet has hardly slowed down. What has changed is the way that it is occurring. If Wikipedia were created today, we think it much more likely that it would have happened in a market. Which is to say that it would not have been Wikipedia at all."

Ironically, Wikipedia's success has in part been a product of the same power law effect that gave us the web giants Facebook and Google. While there may be competing encyclopaedia sites, they are all subject to the same iron law that drives the web towards "One Platform to Rule Them All" or, in this case, Wikipedia.

Once again, I have to conclude that without wider political, economic and social change we are unlikely to see a sufficient number of scholar-led initiatives and diamond OA journals emerge and persist over time such that they will be able to make much of a difference, let alone create a community-owned and controlled OA infrastructure. Above all, the likelihood that governments will provide sufficient funding any time soon seems remote today.[372] As things stand, the future belongs to the market and to the oligopolists. This has to be bad news for the future of scholarly communication and for the research endeavour more generally, but especially for OA.

It is worth reflecting that if there were no *affordability* problem there would be no *accessibility* problem – and indeed no *equity* problem either. Everyone would be able to afford to have access to all the research they needed. Of course, given their financially disadvantaged position this could not be the case for many countries in the Global South. But this tells us once again that the problem lies not with the scholarly publishing system per se but with global inequality. It is an economic and political problem, not one that scholarly publishing can solve (certainly on its own).[373] It also confirms for me that the BOAI goals are unlikely to be achieved without political change.

Postscript

In light of this, it makes sense to finish by considering whether the pandemic might bring about the political, economic, and social changes that would be needed for the BOAI goals to be achieved. Certainly when the extent of the crisis became apparent there was a rush of pundits arguing that "everything has changed"[374] and that the "normal economy is never coming back."

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[372] Responding to yet another call for building OA infrastructure OA advocate Thomas Krichel said recently, "All mouth, no trousers. Libraries have been saying the same thing for years, while continuing to fund the big deals. And now they are busy building open access deals with the same publishers, making sure to cement the publishers' stranglehold of scholarly communication."

[373] There is a discussion to be had as to whether the Research4Life initiative to give free or low-cost access to subscription content might not be a better arrangement than moving to a pay-to-publish system in which publishers may or may not offer fee waivers or reductions.

[374] Put more succinctly here!

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We also saw assertions that COVID-19 has sounded the death knell for globalisation and/or neoliberalism. Even the former investment banker, and now President of France, Emmanuel Macron suggested that the pandemic had provided the world with an opportunity to "invent something new" and to "remake capitalism".

Many also responded to the pandemic by saying that in future the state will play a far more prominent role and that, amongst other things, this will see the world of academia and research reinvented.

And, as we saw, OA advocates were predicting that the pandemic would "change biomedical publishing" for good and "kill off dinosaur legacy publishers".

As the pandemic continues to rage, however, I think this initial optimism has evaporated somewhat. In any case, more sceptical voices were evident from the start. In April, for instance, Moore suggested that "Multinational commercial publishers control so much of the scholarly communication landscape that it is difficult to even entertain the idea of a time in which they do not dominate research dissemination. It's hard to see the virus changing that."

Moore's less upbeat view might seem to have been supported by the announcement in the middle of the pandemic that UNESCO had signed a new open access book partnership with publisher oligopolist Springer Nature[375] (causing some muttering and complaining in the Twittersphere). And in June, The University of California announced that it had signed a "landmark" transformative deal with Springer Nature. These announcements might seem to confirm that the oligopolists are set to remain dominant, if not omnipresent, in the world of scholarly publishing after the pandemic has ended.

Also during the pandemic a group of publishers launched a lawsuit against the Internet Archive (IA) for actions that, they allege, amount to doing "violence to the Copyright Act, and [which] constitute wilful digital piracy on an industrial scale". This was in response to IA's decision to launch a "National Emergency Library" during the pandemic that saw the waitlists for the 1.4 million books in its digital lending library suspended.[376] (The restriction has subsequently been reinstated).

And we saw Italy's public prosecutor take the surprising decision to order the blocking of Project Gutenberg, the world's oldest digital library of full texts of public domain books. Like arXiv, this was an early model for the open access movement.

What happens in future will inevitably depend to a great extent on the state of the public purse once the pandemic has passed. If nothing else, this will determine governments' willingness and/or ability to use taxpayers' money to increase its support for the research endeavour. It is taxpayers, after all, who fund most research, who pay for the production of the papers that report on that research and who, one way or another, pay a large proportion of the costs incurred both by universities and the scholarly publishing system (including funding subscriptions and APCs).

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[375] Even as UNESCO is undertaking a global consultation on open science.

[376] Normally, if you want to read a digital book hosted by IA but all copies are already checked out by other patrons, you have to join a waiting list for the book – just like you would at a physical library.

Citizens also fund research in other ways than through the tax system of course. Here the omens are not great. At the end of April *BMJ* reported that the leading UK charity Cancer Research UK had announced with "great regret" that in response to huge fundraising shortfalls caused by the COVID-19 pandemic it had decided to cut its funding for research by £44m (€50.3m; $54.4m).

BMJ also noted that the chief executive of the UK government funded National Institute for Healthcare Research (NIHR) – the largest national clinical research funder in Europe – had reported that "almost 90% of its non-commercial research has been paused because of the pandemic."

And in June the UK Association of Medical Research Charities (AMHRC) reported a 38% loss in fundraising income, and said that 70% of its clinical trials and studies had been paused.

Writing in *The Lancet* in November, the CEOs of AMRC, the British Heart Foundation (BHF) and Cancer Research UK (CRUK) said that without Government support, life-saving progress for patients is at risk.[377]

Elsewhere, the American Cancer Society, the largest non-government not-for-profit funding source of cancer research in the United States, announced in June that the pandemic had severely reduced its fundraising revenue, and forced it to take significant cost-saving measures, reducing its budget by approximately 30%, and eliminating approximately 1,000 staff positions nationwide.

And in July STAT reported that COVID-19 had left US non-profits "with a funding shortfall that has forced them to cut staff, end grant funding, scale back activities, and in at least one case, shut down entirely."

With non-government funders of research having to clip their wings in this way, can governments make up the shortfall? Certainly, a lot of money has been redirected to COVID-19 research and we have seen a large uptick in journal submissions during the pandemic. But can we assume that this will continue after the pandemic passes? Given the huge debt mountains that governments are incurring as a result of the virus it is far from certain that research funding can hold up over time. Either way, we cannot know what the long-term impact will be. As *Nature* put it in June, the pandemic could be another "sputnik moment or a budget breaker".

True, in July the UK government announced an increase in research spending to £22 billion a year by 2025, but some doubt it will be able to deliver on this (as one commentator put it, it is "not a done deal"). Meanwhile, there are fears that, as a result of Brexit (one further example of the way the world has started to fragment), the country will be excluded from the EU's Horizon programme, whose budget was in any case slashed by €13.5 billion as a result of the

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[377] Members of the Association of Medical Research Charities (AMRC) said they invested £1·9 billion in 2019 alone. This represented 51% of publicly funded UK medical research and exceeded the £1·1 billion invested by the National Institute for Health Research and £800 million by the Medical Research Council. This funding, they added, supports the careers of more than 17,000 scientists.

EU's €750 billion COVID-19 recovery package. (See also here).[378] (€4B of that lost money was later reinstated but researchers remain disappointed that more could not be recovered).

How do things look at the university level? In April, Universities UK (UUK) estimated the risk to British universities' fee income from international (Non-EU and EU) students was £6.9 billion across the UK higher education sector. In addition, UUK said, UK universities face losses in the region of £790 million from accommodation, catering and conference income,[379] even as they are having to fund setting up and managing the costs of students learning online.

UUK's consequent call for a £2 billion bailout package to address the problem was met with a cool response from the Treasury. Rather than provide a bailout, the UK government offered a package of measures that primarily consisted of bringing forward £2.6 billion in tuition fee payments and loans.

And while the government later promised emergency loans for universities in danger of going bust, these were loans, not grants, and they were offered with strings attached – including a requirement that universities focus more on subjects with better job prospects for graduates. This might seem to pose a threat to *academic freedom*. The University of Warwick's student newspaper *The Boar* noted, "Critics of the proposed action have warned that the government is using the Covid-19 pandemic as a means of enforcing its own political ideology on universities."[380]

Moreover, the pandemic comes in the wake of a 2019 British government-commissioned review which suggested that rather than increasing the number of young people attending university, "England needs a stronger technical and vocational education system" to improve post-18 study.

Education secretary Gavin Williamson appears to agree with this. In July he poured scorn on the idea that half of all young people in the UK should go on to higher education – as pledged by Tony Blair in the 1990s and until now supported by every successive government. Williamson described it as an "absurd mantra" and indicated it would come to an end.

The US has to date spent more than $2.5 trillion on its COVID-19 response, but higher education's allocation was just $14 billion. In November *The Chronicle of Higher Education* reported that US colleges have shed a tenth of their employees (484,000) since the pandemic began.

All in all, it is far from clear that governments will be willing to make up the shortfall in university funding over the long term, and far less likely that the large funds that would be needed to re-engineer the scholarly publishing system will be forthcoming. Will not all Western governments feel far more comfortable sticking with the familiar neoliberal toolkit – as happened in the wake of the 2008 crisis?

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[378] Another €4 bn was found at the last minute, but the final figure was described as "underwhelming" by research organisations.
[379] For more on this theme see this article.
[380] Along the same lines, in September UK schools were told by the government not to use material from anti-capitalism groups.

For sure, governments have been providing huge amounts of money to bail out companies and to support employees, but these are intended to keep the neoliberal economy alive during the crisis and viewed as temporary measures not a new mode of being for governments. And again, much of this funding consists of loans and debt guarantees, not grants.

Rather than continuing to throw money about governments will sooner or later have to introduce a new period of austerity, with tax rises and pay freezes. Some have talked of New Deal-type approaches being taken[381] and the UK prime minister has encouraged such thinking. In June he said that a return to austerity "would be a mistake" and promised what he called a "Rooseveltian" boost to public spending to help the country's economy recover from the coronavirus shock.

On closer inspection, however, Johnson's plan seemed mainly to consist of the early release of money already promised. Moreover, it appeared to be focused on fast-tracking the building of schools, hospitals, roads and even prisons, not universities. Johnson's plan was in any case greeted with considerable scepticism, with one commentator describing it as "absolutely fanciful".[382]

In fact, the likelihood is that austerity will come sooner than expected. By November – in the middle of the country's second lockdown – the UK Chancellor Rishi Sunak was announcing that millions of public sector workers would face a pay freeze. Meanwhile, The Institute for Fiscal Studies was saying that tax rises of more than £40bn a year are "all but inevitable".

For their part, UK universities' initial response to the financial tsunami heading their way was to target the most weak and vulnerable, sacking temporary and part-time academic staff.

In late May it was revealed that SOAS in London was slashing budgets and preparing significant staff cuts, in what one of those affected described to *The Guardian* as "a brutal exercise … reminiscent of 'corporate takeovers in the 1980s'." The paper added that SOAS departments "are being instructed to balance their budgets while modelling a 50% drop in new international students."

We also saw claims that Sheffield University was planning to sack 8,000 staff and rehire them on lower salaries.[383] [384] And in Australia 36,000 casual university staff have lost their jobs.

Nothing here suggests to me that we are about to see an end to academic neoliberalism.

For funders and universities heavily dependent on endowments the situation looks no less grim, as they face a serious shortfall in the income they can expect to earn from their investments. To add to the pain, some are likely to have to consider whether they should eat into their endowments in order to get through the crisis, an action that would reduce their capital, and so threaten future income.[385]

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[381] The US New Deal included a raft of job-creating public works projects with the state at one point employing 7 million people. This helped the United States recover from the Great Depression in the 1930s.

[382] True, in November a £100bn investment in infrastructure was announced by the UK government for roads, railways and fibre broadband.

[383] See also.

[384] For a sense of the crisis in UK universities see also this.

[385] Leading to a certain degree of gallows humour.

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Even the UK's cash-rich Cambridge University began talking of extending its current hiring and pay progression and promotion freezes, along with a freeze on capital expenditures on new building projects. In the worst-case scenario, the vice chancellor warned university staff, it may be necessary to make redundancies.

The situation in the US looks no better. The April issue of *the Brief* reported that the University of Arizona had already announced budget cuts and furloughs; that Johns Hopkins had informed its staff that it will cut $475 million from the budget through June 2021; and that the governor of Illinois had said that the state faced a budget shortfall of $2.7 billion this year and expects a shortfall of $7.4 billion for the next fiscal year.

"We expect to see more actions like that of University of Arizona and Johns Hopkins throughout public higher education," concluded *The Brief*, adding, "Academic librarians throughout the US expect to have sharp cuts in their budgets, which will naturally affect the amount of money available for publications, probably putting even greater pressure on the big deal (which was, of course, under pressure already)."[386]

Elsewhere, on *The Scholarly Kitchen* in May, Roger Schonfeld summed up the situation in the US with these words: "The picture that is emerging for the US higher education sector is fairly grim. Most institutions anticipate substantial losses in revenue from tuition, although its magnitude remains highly uncertain for the time being. Many institutions will also expect to see reductions in revenues from endowment spending, spendable gifts, and state support. And, while the federal government has provided some emergency aid to the higher education sector, it only scratches the surface."[387]

Since then further forbidding news has appeared on a regular basis. In May, for instance, Bradley University in Illinois announced that it was offering buyouts to all full-time employees in an effort to trim costs as the institution faces a grim upcoming year in the wake of the COVID-19 pandemic. It added that it anticipated "involuntary reductions" as the university continues cutting costs. And a *NYT* article in October reported: "By one estimate, the pandemic has cost colleges at least $120 billion, with even Harvard University, despite its $41.9 billion endowment, reporting a $10 million deficit that has prompted belt tightening." And it is in US universities, let's recall, where a good deal of the world's research takes place.

Writing in October EBSCO said, "The financial loss faced by universities around the world might mean that some, especially smaller ones, will close permanently or possibly merge. Revenues at many institutions are dropping as students (particularly international ones) remain home or rethink future plans."

Meanwhile, the American Association of University Professors (AAUP) launched an investigation into "the crisis in academic governance that has occurred in the wake of the

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[386] Pressure too, of course, on transformative agreements. That is why I suggested (**Page 64**) that we could end up with a new environment of just-in-time payment for articles via services like Reprints Desk.

[387] In a subsequent report, Schonfeld said that there is little reason to anticipate substantial budget reductions among most major US research funders, but that "the way the academic research enterprise is interwoven with, and in some cases cross-subsidised by, instructional activities pose some risk to research support. There are substantial unanswered questions about how negative impacts to the business models of research universities will affect scientific research."

COVID-19 pandemic" and the effects this is having on *academic freedom* – signalling that the implications of the virus for universities and academics are more than just financial and could impact on research, scholarly communication and open access in unanticipated ways.

Elsewhere, in Australia, we saw predictions that the coronavirus could strip Australia of the equivalent of 14,000 full-time researchers. When, in October, the Australian government provided a A$1 billion (US$710 million) boost for Australian university research in 2020-21 researchers responded by saying that this was not enough to sustain the future of research in the country.[388] Meanwhile in New Zealand we have seen concerns that 1,000 university sector jobs could go.

I see no reason to think the situation will be so very different in most countries, except perhaps China, whose economy appears to be on the up again (also here and here) and which has overtaken the US in the number of scientific papers it publishes. Its $1 trillion sovereign wealth fund also posted a 17.4% return on overseas investments after global stocks rallied.

The subscription model is more resilient?

Even if we do not face the immediate prospect of a new period of austerity will governments really want to use precious taxpayer's money to upend the scholarly publishing system at a time when it faces a hugely challenging fiscal environment, particularly given the perennial concern about free riding in OA discussions.

We might want to question whether governments will be willing or able to spend large amounts of taxpayers' money on universities, let alone fund a new community-owned OA scholarly communication infrastructure – even as they continue to mouth their commitment to "full and immediate open access to all publicly funded research." It would be wonderful if this were to happen, but I struggle to see such a project being very high on any government's spending list in the near to midterm future.

There must therefore also be doubt as to whether university presses and scholar-led initiatives will make much headway in the near future. In June, Ithaka S+R reported that university press directors were expecting to miss budgeted revenue by 5-15 percent this year, mostly due to poor fourth quarter print sales during the pandemic lockdown. For FY 2021 they are expecting 20-40 percent decreases.

Airing his thoughts on this topic on the Scholcomm mailing list earlier in the year, the Director of the University of Michigan Press Charles Watkinson said, "This crisis and its aftermath will clearly push many of us even further over the edge at a time when our parent institutions will likely have bigger funding priorities to deal with."

He added that libraries wanting to support scholar-led initiatives will be pressed hard by administrators to justify whether they "can afford to support born-OA publishers that deliver public good but may be harder to justify supporting in terms of primarily local campus benefit (such as Lever Press or the ScholarLed consortium)."

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[388] The UK and Australia are particularly exposed financially due to the high number of international students they have historically been dependent on. The numbers are expected to fall sharply.

Again, we see free rider anxiety raising its head, as it has with SCOAP3: while Russia, Brazil and India widely use this OA initiative developed to provide access to particle-physics research for free, they contribute nothing to its costs.

Regardless of the likelihood of a new community-controlled OA infrastructure, will the expected new period of austerity be good, bad, or indifferent for open access? Could the pandemic finally see universal open access a reality, as OA advocates hope; or is it more likely to slow, or even reverse, progress?

Some commentators believe the subscription model will be more resilient than OA in the new environment. Both Esposito and Delta Think, for instance, have suggested that fully APC-based open access publishers will be at greater risk then legacy publishers. As Esposito puts it, "We don't know what the world will look like on the far side of the crisis, but I suspect it will be paid content, not OA, whose future is brightest in the recessionary environment we will face."

This too is the view of Kent Anderson, who has suggested "Money will become too tight in the concentrated space of university libraries and funders. The subscription model spreads costs more equitably, and is more resilient." Although this might seem to suggest a different picture.

OA could also come under threat as a result of changed research priorities. Not only has a lot of research money been redirected to tackling the pandemic it is expected that there will be a greater focus in future on close-to-market solutions. One consequence of this, says German politician Christian Ehler, will be that it will weaken the first pillar of the Horizon Europe programme "quite dramatically". The first pillar, he added, is open science and includes research infrastructures (including EOSC I assume) and European Research Council funding.

The impact on library budgets is clearly going to be severe. Writing in the addendum to their May *Research4Life Infrastructure Review and Landscape Analysis*, Rob Johnson and co-authors concluded that the fiscal and monetary stimulus announced by the world's major economies "will place many Western educational institutions under unprecedented financial pressure, with adverse implications for library budgets and expenditure on scholarly resources."

No surprise then that, in July, Penn State University Libraries announced that it will be necessary to reduce spending on library collections by about $2.2 million for the 2020-21 fiscal year. And in September, it was reported that Virginia Commonwealth University Libraries are going to have to reduce collection Expenditures by $500,000 in FY 2021 and $500,000 in FY 2022.

In other words, library budgets are going to be seriously challenged going forward. This will be bad for libraries, bad for publishers, bad for researchers and bad for scholarly communication.

Whatever happens, it looks like the issue of *affordability* will continue to haunt the research community for the foreseeable future. And the situation will surely worsen, not only as a result of the pandemic but because of the additional money that will be required if open science and open data continue to be pushed by governments and funders.

What then of publishers? In their Research4Life Report, Johnson *et al*, argue that in the longer term, "the threats to higher education institutions and the corresponding implications for library budgets, in both high-income and low-income countries, will see publishers come under increased financial pressure, even as governments and funders strengthen their demands for open access."

Many publishers responded to the pandemic by announcing price freezes, but these have generally been greeted with tut tutting rather than gratitude by librarians. When Wiley announced it was freezing its prices next year, for instance, executive director of Research Libraries UK (RLUK) David Prosser commented, "At the risk of sounding ungrateful, I would note that a number of libraries worldwide are modelling budget cuts of 10-20% with some looking at up to 40%. Estimates have suggested that income in the UK higher education sector overall could be down £790 million by the end of the summer and looking at a £2.6 billion black hole in 2020/21. If we do see cuts at that level then I'm afraid that low-single-digit increases, or even flat prices, are not going to be enough." [389]

Subsequently, a public "Content Statement" was issued by RLUK, followed by the UUK-Jisc negotiation strategy group (of which Prosser is a member) calling on leading publishers to cut the fees they charge UK universities by 25%.

Commenting on the statement, *The Brief* said, "One must wonder if Jisc and Universities UK are asking *all* organizations that they (or their members) purchase products and services from for such price reductions *without concurrent product or service reductions*?

The Brief added: "To begin negotiations with the suggestion that in bad times all of the retrenchment should fall on the side of the publishers is extraordinary (even for these extraordinary times) and seems like maybe not the most productive tactic."

What the Jisc call for a 25% cut in publishers' prices vividly underlines is the abiding conviction amongst OA advocates, librarians, and universities that publishers routinely overcharge the research community for the services they provide. Personally, I cannot say how much truth there is in this claim and perhaps few can (with any objectivity at least). What we do know is that when they looked at the issue Delta Think concluded that the *affordability* problem is at least in part a product of a long-standing gap between research output and library budgets, not price gouging.

If Delta Think's calculations are correct it is hard not to suspect that the OA project has from the start been based on a misconception about costs and that it is this that has led them to assume that publishers are parasitic. Either way, OA advocates surely misled themselves over what is possible online by taking too literally internet mantras like "*information wants to be free*".

That said, however, it cannot be denied that the big 5 publishers enjoy enviably high profit levels. It is therefore ironic that OA advocates have helped smooth the way for them to migrate these profits to the OA environment. As I have said, most of the OA policies being introduced will allow publishers to continue to enjoy their historic revenues (and profits) in an open access world. More importantly, funder policies like Plan S will assist them to

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[389] Many publishers have been announcing that they are holding prices steady next year, including University of California Press, the American Mathematical Society, Intellect and Berghahn Journals.

leverage their size and dominance in more worrying ways in the new environment. The most important issue that will need addressing going forward, therefore, may not be pricing but the problems raised by publishers' use of data analytics, and their utilisation of surveillance techniques and data extractivism on their platforms. As noted, it could also see private companies acquiring undue and inappropriate influence over science policies and perhaps over science itself. I therefore feel the need to repeat my questions: Why were the oligopolists allowed to become so powerful and will governments and competition authorities do anything about it going forward?

I am also inclined to suggest that OA advocates might have been better to have spent the last twenty years trying to convince governments and regulators to intervene in the scholarly publishing market, rather than spending so much energy advocating for open access. As noted, the UK Office of Fair Trading flagged the fact that the STM publishing market may not be working well eighteen years ago (2002) and suggested that action may be necessary. The situation has deteriorated since then. Why have OA advocates not been consistently lobbying governments and competition authorities and pointing out that neither internet technologies nor open access has enabled researchers wield the countervailing power the OFT anticipated they would, and insisting that something needs to be done before the situation becomes even worse?[390]

It has become abundantly clear since 2002 that legacy publishers have co-opted open access and that the balance of power between the research community and scholarly publishers is tilting ever further in favour of the latter. And yet no serious or effective attempt has been made to address this imbalance. This is disappointing. As *The Guardian* put it in 2019, "we need a rebalancing of power."

It is even more disappointing that when – 16 years after the OFT alert – two OA advocates did finally write to the EU competition authorities about the matter their concerns were simply brushed aside.

The OA movement should not only be loudly sounding the alarm but highlighting the new issues that are beginning to emerge. As I have said, I believe these new issues are more pressing than *affordability*, or even perhaps of *accessibility*. OA advocates should be educating legislators and competition authorities about the dangers ahead and demanding that something is done,[391] not alienating their peers by demanding ever more draconian OA policies. Moreover, with just two companies now looking likely to dominate the new platform age – i.e. Elsevier and Springer Nature[392] – we are rapidly headed towards Mirowski's nightmare scenario of One Platform to Rule Them All.

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[390] One answer might be that researchers are frightened that doing so could risk their careers. Brembs has explained that a number of OA advocates where involved in the drafting of the letter to the EU, but only he and Jon Tennant felt they were in a position to sign the letter without it threatening their livelihood. I.e. Brembs has tenure. Tennant was, I believe, not at the time in formal academic employment (and died tragically earlier this year). But if you are frightened of your employer is the right response to seek to have that employer beat up on your colleagues rather than try to tackle the underlying political issue.

[391] Now would be a good time to do this, as there may be a change in the air on antitrust issues – as suggested in the recent book called *Competition Overdose: How Free Market Mythology Transformed Us from Citizen Kings to Market Servants*.

[392] That is, if you assume that Digital Science is (or will soon be) part of Springer Nature. There has been some confusion about the ownership of Digital Science. However, both Springer Nature and Digital Science are majority owned by the low-profile German company Holtzbrinck Publishing Group, which also owns a large portfolio of other publishing companies.

Whatever happens, the pressure on library budgets can only intensify going forward. We might therefore want to ask what the implications of that might be?

If the transformative agreement does indeed prove no more affordable than the big deal, at a time when library budgets face ever greater pressure, we might anticipate the system starting to break. Indeed, the rise in unbundling decisions we have seen suggests this could already be happening. We have, therefore, to wonder what will happen if more and more universities find they can afford neither traditional subscription big deals nor new publish-and-read/transformative agreements – a scenario some now anticipate.

If more universities have to unbundle, or cancel their big deal (which, by the way, the University of Delaware has just had to do in November) they will have to source more papers on a per-item basis. Since this could put the ILL system under considerable pressure unbundled universities may have little choice but to buy papers from commercial document delivery services at circa $35 a time. As I have suggested, the danger here is that short-term savings could be achieved at long-term cost.

While this would be a more flexible way of managing costs, using ad hoc document delivery to meet faculty *read* needs **plus** having to pay APCs for their *publish* needs could prove as expensive as a traditional big deal or transformative agreement for some universities. This too could, therefore, turn out to be an unaffordable strategy.

One response might be for libraries to restrict faculty use of document delivery services. If they did, how would researchers respond when libraries started telling them that there is no more money available in the current semester to *buy* articles – a mirror image of Oxford University having to tell its faculty in 2018 that there was no more money to pay APCs.[393]

If budgets became sufficiently pressured, would not universities feel that they had little choice but to reduce or stop paying to publish open access and refocus faculty on publishing for free in subscription journals? The signs are that this could be beginning to happen: the Virtual Library of Virginia announced in September that "due to budgetary constraints" it had suspended a 2019 agreement with Wiley. This agreement – which combined open access publishing rights with journal subscriptions – was suspended just 8 months after the contract had begun.[394]

If more and more universities had to do this we could see green OA – and its most vocal and persistent advocate Stevan Harnad – rehabilitated. However, it would mean that the number of articles going behind paywalls would start to climb again. And as we have seen, researchers have shown themselves to be reluctant to comply with self-archiving policies and libraries struggle to do the depositing for them. We might also expect publishers to double down on embargoes. This could see the *accessibility* problem start to worsen again.

Developments in the Global South could also prove important here. The recent proposal in India for a 'one nation, one subscription' solution, for instance, might seem a further sign that the tide is turning back to licensing content.

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[393] We have seen the same pressure on APC funding at the University of Aberdeen.
[394] Consider also that University Libraries at Virginia Tech has had an APC subvention fund since 2012. It is, however, now reaching the point where "the high rate of growth in requests in recent years, coupled with COVID-related budget pressures, may force us to cap expenditures going forward."

The Indian plan envisages the government negotiating national licences with publishers that would allow all of the country's 1.3 billion citizens to access paywalled scholarly papers. This is similar to the model that Uruguay pioneered some years ago, and which Egypt adopted in 2014. Importantly, unlike transformative agreements, these do not include a *publish* element. They are very similar to the agreement HEFCE signed with Academic Press in 1996, and which subsequently evolved into the now infamous big deal. This could take the research community in yet another circle. That said, it is possible that the Indian government will also make some funds available for researchers to pay APCs to publish in "reputable journals" (for which I read journals with a high IF published by legacy publishers in the Global North). Currently, however, this is not certain.

Oddly, while the Indian proposal mentions the need for a "national level research portal, to "archive science and technology research outputs" there appears to be no proposal for a green OA mandate to help fill that archive. In any case, Indian researchers and libraries are more lax than most when it comes to self-archiving research papers.

Some question[395] whether this is a pragmatic approach for India to take. But the reality is that after flirting with Plan S, India rejected the European approach. Either way, it further muddies the water for the OA movement, not least because India recently overtook Germany in the number of research papers it produces each year and is fast catching up with the UK.

Perhaps a more worrying scenario would be if publishers began to offer "bigger deals" in which they significantly reduced their prices (perhaps even by as much as the 25% that Jisc wants) on the understanding that universities give up data on their researchers and their research and/or agree to tie the deal to a range of other analytics and discovery products – a model that might seem already to be on the table if we consider the deal that Elsevier has already done with Dutch funders. Such deals would help publishers improve and perfect their AI and analytics products, build out their new platforms and portals, and would (I anticipate) more than compensate them for any subscription or APC income they gave up. It would also help publishers further embed themselves in the entire research lifecycle. In such a scenario, one could imagine that a few years down the road universities had to conclude that they had robbed Peter to pay Paul.

Yet a further scenario was suggested in a comment on the *Scholarly Kitchen*. This envisages "more use of preprints and consolidation of research reporting into fewer articles covering more work." As I have suggested, widespread use of preprints is not unproblematic and we are in any case likely to see preprint servers either become component parts of legacy publishers' workflow systems or have to behave more and more like traditional journals in order to avoid the kind of issues we have seen with COVID-19 preprints. This in turn would likely see them start to charge fees for use of their services to cover their increased management costs. Preprint servers may simply evolve into OA journals and the research community could find it has gone in yet another circle. Moreover, use of preprints would seem more likely to further drive the firehose of papers, rather than reduce the number. This would worsen the *discoverability* problem and so increase the need for the sophisticated discovery tools publishers are developing.

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[395] See also.

If, on the other hand, a shortage of money forced researchers to publish fewer articles it might be seen as a positive development, not least because it could be expected to reduce the practice of salami slicing. It would also please those who are concerned that too many papers are being published. Last year former president of the British Science Association Uta Frith proposed that researchers be restricted to publishing just one paper a year. It is time, she suggested, to "ask ourselves what good does the glut of fast-appearing publications do for science", particularly at a time when publication output will be swelled "by reports of null results and replication failures."

And if EBSCO is right to anticipate that a pandemic-produced funding crisis will see universities having to close there would likely be fewer researchers – and so presumably fewer papers in need of publishing. Ironically, this might help resolve the *affordability* problem, and would presumably mean that less public money had to be spent on scholarly papers that add little to our knowledge of the world. While this might be good news for taxpayers, it would mean the research community having to face the kind of downsizing that OA advocates predicted for publishers.

But this is all speculation of course. A recent Digital Science report posed a different set of questions for its readers: "Will research funding intensify to address key problems that need to be fixed, or will it be sacrificed on the altar of austerity? Will universities be able to continue to rely on international students, or will they seize the opportunities of continuous education that will be needed in the age of AI? Will the economy move toward a 'green reboot' and research focus be drawn in sync with these policies toward sustainable development goal-oriented topics? Will corporates see the opportunity to invest further in research but, as part of their new stakeholder-driven responsibilities, make their research more openly available in a reversal of Mazzucato's Entrepreneurial State."[396]

Right now, no one knows the answers to these questions.

Uncomfortable truth

Looking back, I am inclined to suggest that the uncomfortable truth about the open access movement is that – grand words and declarations about *equity* and uniting humanity "*in a common intellectual conversation and quest for knowledge*" aside – what sparked and to a great extent drove the movement was a concern about *affordability*. Yet over time this objective has been either lost sight of, or sacrificed, as the focus has narrowed to that of simply increasing the raw number of papers made OA (often, it might seem, at whatever cost). This has been accompanied by governments and funders forcing OA on the world without due thought given to the likely consequences.

Today, I can only puzzle at how *we all*[397] assumed that the BOAI goals were achievable without wider economic and political change. Strikingly, by insisting that open access be forced on the world, by insisting on mandatory CC BY, and by supporting initiatives like Plan S, the OA movement has helped put in place the building blocks that will allow publishers to acquire even greater control; and not just over scholarly communication but

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[396] Interestingly, the Director of Research at Research England Steve Hill cited Mazzucato's book in making an argument (as I understand it), that the UK government should be more directive about what research is undertaken and who should be tasked to do it.

[397] I do not exclude myself here. I too was guilty of naivety.

potentially over national/regional science policies as well. As a result, the *affordability* problem looks set to worsen. And as the library budgetary crisis deteriorates further, and the geopolitical tensions increase, the *accessibility* problem could prove just as hard to resolve.

Whatever the eventual outcome, the pandemic has surely made solving the *equity* problem considerably more difficult. As the authors of the Research Consulting report note, this is likely if for no other reason than "philanthropic donations and activity by both publishers and libraries [to assist those in the Global South] may prove difficult to sustain in a period of increased budgetary constraints." The pandemic is also having a negative impact on equality and diversity more generally, not least for female scientists, and those in the 'bench sciences', especially where they have young children. All have experienced a substantial decline in the time they are able to devote to research as a result of COVID-19.

Meanwhile, the proportion of research that is privately funded is growing.[398] A recent BMC article reported "private companies are gaining an increasingly prominent role in the research field, while academia is losing its predominance." What kind of challenge this might present to open access I cannot say. But it might see less research made publicly available. And as the balance between private and public research shifts other problems will likely arise. We could see a decline in fundamental research for instance.

Thinking about my experiences at BT and Micronet, and trying again to locate this document against a longer timeline, I feel compelled to repeat my earlier point that no information service (be it online or offline, be it distributing public or private information) can hope to continue operating unless its funding (or other sources of revenue) persists over time.

It is unclear to me that many OA advocates are yet willing, or able, to accept what might be considered the first lesson in a Business 101 course: that for any concern that incurs regular costs (i.e. most, if not all, concerns) to survive it must have a realistic sustainability strategy in place. Unfortunately, as things stand, funding for OA infrastructure and scholar-led initiatives is not just hard to obtain but when obtained almost invariably time-limited. The lack of imagination about costs I believe I detect in the OA movement surely owes much to the widespread dissemination of internet mantras like "*information wants to be free*" and unthought-through assertions about *rival vs non-rival* goods. This has led OA advocates to assume (unconsciously perhaps) that information can somehow fly through the ether without incurring any costs – courtesy of some kind of internet pixie dust. Information may indeed *want* to be free, but the cost of managing and distributing it at scale can never be.[399]

One need only consider the expense of operating services on the internet to appreciate that there is no online pixie dust. The energy needs of the internet alone are now significant. A research report published last year estimated that around 10% of the world's total electricity consumption is now used by the internet, up from 8% in 2012. Someone, somehow, has to pay these costs.

And that is before we start to factor in all the other ingredients that are essential for publishing and distributing research online effectively. These can include costs that people give little or no thought to until they start having to pay the bills. In September, Open Science Framework (OSF) alerted its users to the sustainability issues it is facing as a result of the

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[398] Of research not necessarily of research papers.
[399] This tweet expresses the problem well.

high storage costs it is incurring as a result of its users archiving and sharing their research data, materials, protocols, outcomes, and code etc. over OSF. And as noted earlier, arXiv – which remember is a preprint server, not a publisher – now requires $2.6 million a year to operate. Again, someone, somehow, has to pay these costs. I see no pixie dust here.

Perhaps before demonising for-profit publishers (which I plead guilty to having done, and I still find myself constantly doing in a knee jerk way!) we should at least acknowledge that it is private interests that take the financial risks in developing and running for-profit publishing solutions. If the scholarly publishing infrastructure were funded by taxpayers instead it would be we citizens who would have to take the financial risk.

I believe the case for a publicly owned research infrastructure is compelling, but we need to be realistic about the costs that such an infrastructure would incur, and we need to be realistic about the likelihood that governments are willing to provide sufficient funds for this in today's political and economic environment, even before we consider the ubiquitous concerns about free riding or the impact of the pandemic. We also have to recognise that public money is often spent more wastefully than private money, if only because those spending it don't generally suffer personally if they use it unwisely or inefficiently, or simply waste it.

My second point is that COVID-19 has forcibly reminded us how easily disinformation can flow through the network, and that scallywags and scoundrels are more than happy to callously exploit even serious health issues in order to perpetrate internet fraud and engage in other predatory online activities. This was becoming increasingly prevalent and serious before the pandemic. The virus has made it worse.

If we then factor in the deteriorating geopolitical situation it seems entirely possible that at some point politicians will decide that the internet has become unmanageable. If they do, they may take a leaf out of BT's book and start closing or blocking services, or even disconnecting their country/region from the larger internet. The latter is what Russia, China, Iran and North Korea already seem intent on doing. And is that not the implication of the EU policy document I cited proposing a European Internet able to exclude countries the EU does not approve of?

In what might seem a similar development in the US a proposal has been made to create what *Quartz* calls a "digital Berlin Wall" between the US and China. This appears to be implicit in the US Clean Network Program. To what extent, if at all, a Biden administration might change this I cannot say. But the magazine *Foreign Policy* has suggested "There is now a bipartisan recognition in the United States that China is a strategic competitor. Indeed, while Beijing may appreciate soon having a more predictable set of interlocutors, it should not expect them to be more pliable."

Consider also some of the comments made by EU officials at a Science|Business conference in September called 'Industrial R&D: Europe First'. The event was dedicated to digital sovereignty and focused on the need for Europe to become less dependent, not only on Chinese but also US technology. Speaking at the event Mariya Gabriel, EU research commissioner argued that Europe is in a competitive race and so cannot afford to be "naïve" on the issue. And Jean-Eric Paquet, EU director for research and innovation suggested that the EU has "not necessarily been analysing deeply enough where cooperation may not be in our interest."

Meanwhile, the European Innovation Council (EIC) has established a "special tech sovereignty taskforce", to put a greater focus on developing neglected technology areas.[400]

It is hard not to conclude that the mounting desire for digital sovereignty must come into increasing conflict with Europe's current obsession with openness. As I see it, the two things are ultimately mutually incompatible. Indeed, some three weeks after the above mentioned conference EU research ministers agreed to erect barriers against Chinese and US giants taking part in EU research programmes, in what was described as a strategic move against foreign technology dominance. Science|Business noted: "EU officials are particularly concerned about the potential for Chinese state-controlled enterprises to take data or intellectual property from European companies and export it to China."

The article ended with a quote from the architect of Plan S (and former director-general of the European Commission's research directorate) Robert-Jan Smits. This decision, he said, "could mean a step away from – and perhaps the end of – the EU's '3-O policy' of open science, open innovation and open to the world, which I would regret."

When Trump got into a dispute with Twitter we saw him threaten to shut down social media sites. In a bizarre twist in this direction Trump later said he would ban two Chinese services: WeChat and TikTok. In the latter case it was eventually agreed that a new company called TikTok Global would be formed so that TikTok could be divested from the Chinese owner ByteDance, with Oracle and Walmart jointly owning the new company. It is not entirely clear how this might develop. Trump said that China must cede control of TikTok or he 'won't make the deal', but at the last minute a US court blocked his order. In response, the US Commerce Department said that it wouldn't enforce the order "pending further legal developments." Trump has gone but we don't know how that will affect things. As we have seen, we cannot assume that a Biden administration will view things so very differently *vis-à-vis* China.

Moreover, such actions have not been confined to the US. In June, India announced that it was banning 59 Chinese apps, including WeChat.

The point is that given today's rising geopolitical tensions it is perfectly possible that we will see services being disconnected from the global network, much in the way that MicroLink's access to the Telecom Gold email system was disconnected and the service subsequently closed. We can also expect to see national parts of the current network split off and the web become increasingly balkanised. This is more likely given that much of the undesirable content, hacking and ransomware attacks we have seen in recent years are believed in the main to come from abroad. This was certainly the view taken over the WannaCry ransomware attack in 2017 that saw hospitals targeted, with security agencies concluding that North Korea was responsible. (See also).

Either way, there is a general sense today that allowing unmediated, unrefereed information to run freely across the web is dangerous and needs to be controlled and/or filtered.[401] Commenting on this issue in May, Joan Donovan, Director of Harvard Kennedy Schools Shorenstein Center on Media Politics and Public Policy told NBC News. "The early notion

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[400] European Commission President Ursula von der Leyen, when laying out her priorities for office last year, said the EU "must have mastery and ownership of key technologies in Europe".
[401] Be it the fake and predatory information we see on the social web or fake and/or inadequate and self-serving research we have been seeing being posted on preprint servers.

that users could be both producers and consumers of information has turned platforms into information landfills, where people are forced to sift through increasingly dangerous garbage in the search for real information."[402]

Donovan [added](#), "Information is extremely cheap to produce. That's why misinformation is a problem, because you don't need any evidence, you don't need any investigation, you don't need any methods to produce it. Knowledge is incredibly expensive to produce. Experts are sought after, and they aren't going to work for free. So, platform companies can't rely on the idea that the web is something we build together."[403]

This seems to me to be a striking reframing of the Stewart Brand meme and suggests that a new view is emerging that believes filters and gateways are essential on the internet, if only to sift out the predatory spammers, scammers and scoundrels that [roam unchecked](#) online, ripping off citizens, spreading fake news[404] and preying on the [young and vulnerable](#). And gateways might seem to imply the necessity for paywalls – because filtering costs money.

Step by step, blow by blow

To return to the question of whether the pandemic might change the way research is shared and see global collaboration increase: during the COVID-19 crisis we have indeed seen scientists sharing data and research more than ever before, and we saw publishers temporarily remove paywalls. We also saw a huge upsurge in the posting of preprints. But is this not likely to prove a temporary phenomenon? In any case, many believe that the tide of papers produced has in many instances caused "[more harm than benefit](#)."

More importantly, in the future it might not be scientists alone who decide the degree of *collaboration*, *co-operation* and *sharing* that takes place between researchers in different countries, but politicians as well. And the signs are that politicians are now more inclined to limit and control cross border sharing than encourage it, certainly where it involves sharing information about science considered to have national importance or with scientists based in countries deemed hostile and/or believed to engage in IP or research theft – as [this article](#) suggests. However much sharing we have seen during the pandemic, in the long run COVID-19 may be more likely to drive a wedge through global co-operation than increase it.

Certainly, we have at times seen more jostling than co-operation over COVID-19 at the political level. We saw [tensions](#) between US states over how to respond to the pandemic and we saw [similar jostling](#) in Europe. When discussions took place over the EU recovery budget, for instance, the so-called frugal countries – the Netherlands, Austria, Sweden, Denmark and Finland – insisted that aid to Italy, Spain and other Mediterranean countries that had at the time taken the brunt of the pandemic should mainly be made in the form of loans, not non-repayable grants. This led the Polish Prime Minister Mateusz Morawiecki to brand the frugal countries as "stingy, egotistic states". We have also seen [bitter rows](#) between central government and local leaders in the UK over the degree of support given to cities in the North of England when their citizens were placed on lockdown because of the virus.

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[402] Again, these are the kinds of comments we are beginning to see made about preprint servers too. Indeed, some have [suggested](#) that predatory preprint servers are now emerging.

[403] It also turns out that detecting misinformation is getting [increasingly difficult](#).

[404] And the situation gets worse each year, as new technology allows not just deep fakes, but [fake journalism](#) in which unique profile pictures can be created by AI.

Consider also that simultaneously with calls for greater collaboration over COVID-19, we have seen the alarm sounded over Russian, Chinese and Iranian hackers targeting coronavirus research labs in the West, and spying on healthcare bodies. In July, Britain, the US and Canada publicly accused the hacking group Cozy Bear (said to be part of the Russian intelligence service) of "attacking academic and pharmaceutical research institutions involved in coronavirus vaccine development."[405] And in October, the UK's National Cyber Security Centre (NCSC) reported that it had handled 723 cyber incidents between September 2019 and the end of August this year, including 194 directly linked to the coronavirus pandemic.

The reason for this national rivalry is quite clear: the pandemic has sparked a global race, both for a COVID-19 vaccine and for other forms of medication that can be used against the virus. The winners of this race can expect to benefit hugely in terms of prestige – for researchers, for universities and for politicians and countries. More importantly, they can hope to benefit financially. On the day Pfizer and BioNTech put out a press release (with no data) saying that their vaccine was more than 90% effective in preventing COVID-19 in participants without evidence of prior SARS-CoV-2 infection its CEO sold $5.6m of shares after their price had shot up.[406] Between them these two companies are expected to make $13bn from their coronavirus vaccine.[407]

At the same time, we are understandably seeing concern that countries will be locked out of vaccines and other vital medication. At the end of June there were reports that the US had bought up virtually all the stocks of one of the two drugs proven at the time to work against COVID-19 (Remdesivir) for the next three months, leaving none for the UK, Europe or most of the rest of the world. And in August Trump signed an executive order directing the federal government to buy certain drugs solely from American factories. Some have dubbed this "vaccine nationalism" (see also). In November it was reported that most of Pfizer's vaccine had already been promised to the richest countries, and BBC World Service has said that there is not expected to be sufficient vaccine available in the world until 2024. In the meantime, the rich countries have already bought up most of the vaccine available.

For the same reason, we have seen an increasing tussle over the patenting of COVID-19 vaccines. Questions naturally arise over who will benefit from any patent (and when), who might be excluded by it, and what royalties will be charged to whom. (See also here and here).

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[405] In September the Canadian government issued a further warning, saying, "The Government of Canada is encouraging all members of the research ecosystem to be aware of the potential risks to their work and asking them to take appropriate measures to protect their knowledge creation and innovations, all while maintaining a strong commitment to Open Science and support for a global research response to the COVID-19 pandemic."
[406] In July it was announced that three professors at Southampton University had become paper millionaires as a result of developing a drug that was said to reduce the likelihood of patients developing a severe version of COVID-19 with their breathlessness "markedly reduced". Elsewhere, AstraZeneca shares hit a record high on hopes that the vaccine it is developing will be successful. Meanwhile, the Russian government was boasting that it is ahead of rivals in developing a vaccine – an announcement that attracted some derision in the US, and questions were highlighted in *Nature* about a Russian paper published in *The Lancet* that reported on the virus.
[407] For a sense of how much the various vaccines will cost see this article.

156 Open access: *"Information wants to be free"*?

Open advocates insist that vaccines should be treated as a public good. So too did a committee of UK politicians, who in July asked the UK Government to consider "adjusting intellectual property provisions to allow for compulsory licensing of therapeutic drugs or vaccines against COVID-19, as a means of ensuring they can be made available as quickly, widely and cheaply as possible".

But as countries hunker down and focus on protecting their own citizens there are reasons for doubting this will happen. Certainly, it is far from clear that many governments and IP-obsessed pharmaceutical companies working on COVID-19 treatments are sympathetic to such proposals.[408] And while there have been calls for greater openness about the costs and terms of providing COVID-19 vaccines, and some companies have signed a pledge to make their IPR freely available, comparatively little voluntary action has been taken to date with respect to IPR covering vaccines or therapeutics.

Above all, we have seen a failure to collaborate internationally at the political level. As former UK Prime Minister Theresa May pointed out in May, there appears to be no effective international co-operation to manage the situation. As she put it, "there remains no collective international view as to what works best in dealing with the virus – nor does there seem to have been any attempt to form one. This risks exacerbating the shift towards nationalism and absolutism which is emasculating the institutions that served us well over decades."[409]

True, we later saw the Vaccine Alliance (Gavi) partner with the WHO and CEPI to manufacture and equitably distribute a vaccine for Covid-19 under the COVAX initiative.[410] In August, however, the US announced that it would not be joining the global initiative (although Biden has said he will overturn the decision next year). Russia too has declined to take part and we have yet to see how effective COVAX will be in practice.

We could also note that while the UK government announced in September that it would commit £500 million to COVAX, this came after a July announcement in which the UK said that, due to the growing economic crisis, it was slashing its foreign aid budget by £2.9 billion. At the time, it said that it would nevertheless keep the level at 0.7 of GNI. However, in November, it said that it has now decided to (temporarily) reduce development aid to just 0.5 of GNI, which will see a further £4 billion reduction.

The UK also announced that it is merging the Department for International Development and Foreign Office, on the grounds that for too long "UK overseas aid has been treated like a giant cashpoint in the sky, that arrives without any reference to UK interests".[411]

Mukhisa Kituyi, Secretary-General, United Nations Conference on Trade and Development (UNCTAD) has said, "From smallpox to Ebola, international collaboration in health and science has historically been a major success. It has led to breakthroughs and advances we could not have imagined if countries had gone it alone. But a post-COVID-19 world faces

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[408] See this for instance.

[409] The analogy here with the biodiversity challenge might seem instructive. A biodiversity report published in September concluded that the world is failing to address the problem. As a *Science* report puts it, "Only six targets have been even partially reached and some indicators are headed the wrong way." This is the collective action problem writ large.

[410] The plan was developed by the WHO, collaborating with the Coalition for Epidemic Preparedness Innovations and Gavi (the Vaccine Alliance).

[411] Unsurprisingly, this attracted some criticism.

further retreat from multilateralism, undermining international collaboration in scientific and health research at a time when we need it most."

A large part of the problem here, of course, has been the deteriorating relationship between the US and China. This was having serious consequences for international scientific co-operation before the pandemic arrived.[412] Both NIH and the NSF have been investigating and punishing scientists for undeclared foreign ties with China, and the NIH cut funds that were supporting research in China.

Trump's administration also terminated the US's relationship with, and funding for, the World Health Organisation, on the grounds (argued the US) that WHO had allowed itself to become a "puppet of China".

While Biden has promised to overturn this decision, the tensions with China are not going to go away anytime soon, and have been further exacerbated by China's actions in Hong Kong, not least the introduction in July of new security measures. The US responded by threatening further sanctions against China and in July signed the Hong Kong Autonomy Act. It has also curtailed ties with the island and revoked Hong Kong's special status. And in August it announced that any Confucius Institute set up by China in the county would need to register as a foreign mission.[413]

There have also been the tit-for-tat closures of consulates by China and the US. As the *NYT* put it, "Step by step, blow by blow, the United States and China are dismantling decades of political, economic and social engagement, setting the stage for a new era of confrontation shaped by the views of the most hawkish voices on both sides." Again, the good news is that Trump has now gone, but we cannot expect Biden to change the US relationship with China dramatically. In November, Reuters reported that he is unlikely to end the trade tariffs imposed on China. And it is expected that Biden will be seeking to persuade allies to help put more pressure on China to "live up to its responsibilities".

Moreover, the conflict with China is spreading globally. In response to the new Hong Kong security law, for instance, the UK suspended its extradition treaty with the island. And China's relationship with a growing number of other countries is deteriorating, not just with the US and UK[414] but also Australia,[415] and Japan (see also)[416]

The Confucius Institutes have been a particular stress point in recent years. Apart from the US, for instance, universities in Germany have now started to close their Confucius Institutes, as have those in Sweden. Reporting on the Swedish action, *University World News* explained that there are a number of other matters at issue for the country too, including "alarm over Chinese takeovers of local companies; security concerns; human rights abuses and repression in China; conflict in the Xinjiang autonomous region of far north-west China; and the case of Gui Minhai, the Swedish publisher who was abducted in 2015 and jailed in China.

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[412] See here for a sense of the impact it is having on Yale.

[413] In August, US Secretary of State Mike Pompeo, in a statement, labelled the Confucius Institute US Center in Washington "an entity advancing Beijing's global propaganda and malign influence campaign on U.S. campuses and K-12 classrooms."

[414] See also here and here.

[415] See also this.

[416] Action by the Japanese government, observers have said, could make Japanese researchers reluctant to collaborate with international partners and discourage researchers from coming to Japan.

India, meanwhile, has been in a long-standing border dispute with China and in November Indian Prime Minister Narendra Modi was said to be (in effect) attacking China when he said that the entire world is troubled by expansionist forces as the result of "a mental disorder" that reflects 18th-century thinking.

And in June *University World News* reported that, as a result of the border tensions with China, "the number of queries from Indian students for Chinese universities has dropped dramatically."

Both Canada and Australia have become increasingly unhappy with China too. Meanwhile, Turkey is becoming increasingly problematic for the West. (e.g. here)

Developments like these must inevitably inhibit global *collaboration*, *co-operation* and *sharing* and can only be bad news for the open access movement.

All that said, it is of course possible that the pandemic will yet usher in a new age of political and economic enlightenment with a much greater focus placed on equality and *equity* – particularly if one factors in developments like the Black Lives Matter movement.

Might we yet see governments take an entirely different attitude to the role they should play in managing the economy?[417] If they did, could we see increased long-term funding for research and for universities? Might we yet see a radical rethinking of the way in which scholarly communication takes place? Might we see commercial publishers spurned in favour of public investment in non-profit and scholar-led initiatives for instance? Might we see the competition authorities finally intervene in the scholarly publishing market and contain and limit the growing power of the oligopoly?

One can surely hope. What does seem likely is that governments will finally take on the web giants. Amongst other things, this could see them demand that web platforms pay users for their data, and perhaps we could see them broken up, with both extractivism and data capitalism pushed back. If we did, one consequence might be that the number of free services, and the availability of free information, would fall dramatically, as online companies sought to replace the money they currently earn from these activities with new pay-to-use models. Last year Google outlined a number of new monetisation strategies which includes new subscription/ membership options. Such developments might be expected to have implications for scholarly publishing too.

However, for any of this to happen I believe we would need to see a sea change in the political landscape of the West. Trump has gone – hooray. But we have to wonder whether the septuagenarian Joe Biden is willing to oversee an overhaul of the US economic and political order and reject neoliberalism. After all, the US is the epicentre and prime exponent of capitalism.

Moreover, Biden's role in the passing of the 1994 Crime Bill, his association with The Patriot Act and the hysteria he helped create over the "The Drug Trade" do not suggest the actions of a liberal, let alone a left-of-centre politician. And remember the Democratic party rejected the

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[417] After all, both the UK and US have perforce had to consider the possibility of taking ownership stakes in companies and (in the UK) the rail network, which might not otherwise have survived the pandemic.

progressive candidates Sanders and Warren in favour of Biden's expected safe pair of hands. The assumption is that Biden will return the US to pre-Trump days – the status quo ante – not dramatically rethink how the US economy is managed. Whatever Trump and Republicans may say about Biden being a socialist such claims are a nonsense! Indeed, we are already seeing the left-wing of the Democratic Party flexing their muscles out of concern that Biden is not sufficiently committed to progressive policies, even before he has taken office.

I do not anticipate the kind of political change that would be necessary to achieve the BOAI goals occurring in the UK or the EU either.

Of course, there will be changes. As noted, Biden has promised to reverse Trump's decision to leave the WHO and he has made big promises about tackling climate change, including re-joining the Paris Agreement. He has also said that he will reverse the travel bans and visa restrictions that Trump introduced. Importantly, he has said he will "listen to science". But we don't really know what Biden's policies on science might be as he has not taken much interest in the topic historically. So we don't know what his priorities will be beyond an expected immediate focus on COVID-19. As science-policy expert Michael Lubell put it to *Nature* in October. "Biden fundamentally is a blank page. He's certainly not anti-science; it's just not a priority."[418]

Besides, even after Trump has gone, Trumpism will live on, as the *Financial Times* puts it.[419] After all, some 70 million Americans voted for him, and he has surely changed the Republican party for good, as well as dividing America in ways that will outlast him. And we should not doubt that Trump will remain a divisive public voice sowing discord on Twitter, perhaps setting up his own version of Fox News. Moreover, during his period in office Trump appointed three conservative Supreme Court judges. This has long-term implications. And if the Republican party retains control of the Senate[420] we can expect Senate majority leader Mitch McConnell to block Democratic plans (as he did constantly during the Obama administration).

The *NYT* has reported[421] that in anticipation of Trump losing, federal agencies set about securing his legacy by scrambling to finish dozens of new rules affecting things like environmental rules and privacy, and filling key vacancies on scientific advisory boards with members who will hold their seats far into the next presidential term.[422]

Above all, a post-Trump world does not mean the end of populism, either in the US or elsewhere. We see it growing in many countries today – this BBC image gives a sense of how nationalism has been growing in Europe. And this article offers an explanation of why it is happening. Even if populism were to decline, I don't see nationalism and national conflict ending; rather I expect it to grow as the world enters a new period of conflict between countries over "digital sovereignty" and technological supremacy. In November, in a desire to acquire digital sovereignty the UK announced that it plans to introduce new legislation that will allow the government to block foreign takeovers in 17 sectors, including defence,

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[418] Subsequently, it was reported that Biden has promised to increase federal research funding.
[419] See also this.
[420] A runoff for two Senate seats in Georgia is not scheduled to take place until January, so we won't know until then.
[421] See also.
[422] This has faced some resistance from EPA staff.

energy, transport, artificial intelligence and encryption. And we have seen rising concern in the EU too.

We are also seeing an increasing push from conservatives around the world to have their voices heard. They believe they have for too long been silenced, and they want to see what they view as an imbalance corrected, both in universities and in society more generally. To this end some are looking to co-opt education for nationalist purposes. As this article describing recent events in Japan says "conservatives have redefined the purpose of education from a public good in itself to a means to culturally nationalist ends."[423]

The pushback from conservatives has been aided by the publication of books like Kirsten Powers' 2015 *The Silencing: How the Left is Killing Free Speech*, and this pushback has helped drive the growing Social Justice movement. It has also led to the global trend known as the Culture Wars, which is impacting both society at large and science and scholarship too. Amongst other things, we are seeing a plague of de-platforming and the emergence of the cancel culture in academia.

A key point to make is that Trump's stance on China is only an exaggerated version of a concern that has been building for some years, both in the US and elsewhere.[424] This tells us that attitudes towards China are highly unlikely to change substantially in a post-Trump world.[425]

Above all, we have to question whether, in light of China's very different attitudes and political system, along with its brutal disregard for human rights, the West can ever accept the country's aspirations of becoming a world leader, even as those aspirations grow. As Adam Tooze put it in the *London Review of Books* in July, "[E]ven if Beijing were willing to embark on a programme of dramatic domestic rebalancing, do we really believe the problems between China and the US would go away? Is the trade war really about trade? That might have been plausible a few years back, but today's tensions go far beyond economic issues."

What we are witnessing is a global reset of the post-war political status quo, and not just *vis-à-vis* the West and China but Russia too.[426] The long-awaited UK report from the Intelligence and Security Committee into Russian activity makes clear that we can expect relations with Russia to be different in future.[427] And with Russia and Iran accused of interfering in the US election (see also) and US-Russian military tensions growing, the global reset may turn out to be more far reaching than we expect. Tensions with Russia seem likely only to intensify under Biden – who has described the country as "the biggest threat to America's security" – as they are likely to do with Iran as a result of the assassination of Iranian scientists Mohsen Fakhrizadeh which, if nothing else, is expected to make it very difficult to salvage the nuclear deal that Trump withdrew from in 2018.

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[423] As the *Times Higher* talks of, "the debilitating political tensions that escalated during the Trump administration and that contributed to a perception among many conservatives that higher education institutions are lined up against them in the culture war."

[424] A reassessment of US-China relations began 10 years ago when Hilary Clinton was secretary of state.

[425] "The fact is that the good old days are over. The global economy is shifting, the unipolar world is gone and the geopolitical world order is evolving," said Gerard Postiglione, emeritus professor at the University of Hong Kong (HKU) said at a recent HKU faculty of education online seminar.

[426] Not to mention growing tension with other states considered hostile to the West, including Iran and South Korea.

[427] Amongst the many concerns about Russia is that it poses a significant threat to the UK infrastructure.

Other countries are coming into conflict with Russia too – e.g. as a result of the poisoning of the Alexei Navalny poisoning, Germany's relationship with Russia has come under new pressure. And in the backyard of scholarly publishing, in October we saw the FBI and the Cybersecurity and Infrastructure Security Agency (CISA) warn that "foreign-backed online Journals" could be spreading election disinformation.

Perhaps we are seeing an East-West divide emerge that will be not so dissimilar to the 20th Century's "Cold War".

In short, a long-term global power struggle has begun, and this can only impact negatively on international *collaboration*, *co-operation* and *sharing*, both in general and within the research community. Against this background, calls for greater openness and sharing are likely to be greeted with growing scepticism.

Moreover, when push comes to shove old habits die hard and institutional, economic, political, and national interests invariably trump calls for global sharing. When asked to sign up to initiatives intended to create greater global *equity* people soon start to worry about what it will mean for them personally, for their organisation and for their country. As we have seen, for instance, when proposals for sharing research and data with other countries are put forward, concerns over free riding soon surface (as we saw with David Price, Jean-Claude Burgelman, Frans Oort and, more recently, EU officials).

Above all, there is a deeply ingrained belief that countries must compete more than co-operate with one another, and with a global ideological battle apparently underway I don't see this instinct disappearing any time soon. Increased nationalism will only reinforce it.

Neoliberals maintain that in the age of the internet data is the new oil and the technologies able to harvest, assemble, parse and mine data (e.g. AI) are the new gold. As such the ownership of data, and the ownership of cutting-edge technologies able to make sense of and monetise data, are increasingly viewed as essential for economic success. These will surely be the things that individuals, companies and countries jostle over in future, both in order to gain competitive advantage and to prevent others from gaining it (not to mention their role in effective defence and counter-defence). What price openness here?

I am *still* not going to rule out the possibility that we could yet see a world of universal open access, not least because I would really like to see it happen. On a positive note, a recent Simba report suggested that the open access movement will grow as a result of the pandemic. "As support for the movement grows, it could bring with it increased political will to implement tougher open access mandates and policies meant to accelerate the transition to open access, *à la* Plan S. At the same time, development of infrastructure to collect and disseminate methodologies, procedures data and results is likely to emerge as a new focus of the OA movement post pandemic"

But as the issue of who will develop and own this infrastructure comes into sharper focus the gap between aspiration and reality must surely widen. As EBSCO has pointed out, "While OA has steadily gained momentum over the past few years, and the COVID-19 pandemic has increased the desire to improve the way research results are communicated, the same fundamental question of where the money required to support OA publishing will come from remains unanswered."

Whatever the future holds, it is my belief that unless we see significant economic, social and political change any brave new OA world that emerges will likely see us having to conclude (to borrow the apocryphal quote from Spock): "It's open access Jim, but not as we know it."

It may be that *Information wants to be free*, but there are so many reasons why it will always struggle to be free. More importantly, we have learned that even in a digital world the costs of sharing information (however *free* it may itself be, or want to be) are not insignificant. There is no pixie dust here; there is no Tinkerbell; and, unlike Peter Pan, we all surely eventually have to grow up and recognise the way the world is. Personally, I have always found that difficult. Maybe it is time I did!