

# SAILING THE SEA OF OPEN ACCESS: CELESTIAL NAVIGATION OR DEAD RECKONING?<sup>1</sup>

Kevin P. Murphy<sup>2</sup> and Aaron B. Johnson<sup>3</sup>

DOI: 10.2138/gselements.16.5.298

## INTRODUCTION/HISTORICAL BACKGROUND

In 2013, *Elements* published an article by Speer et al. entitled “Open Access: A Current Perspective”. The present article is intended to provide an update on the subject and to discuss how the open access landscape has changed since then.

The notion of open access (OA) began to gain traction in the mid-late 1990s (Laakso et al. 2011). The Bethesda Statement (2003) followed a year later with the definition of ‘open access’ as: “free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit, and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship.”

As pointed out by Speer et al. (2013), the main drivers towards OA publication were the ever-increasing subscription costs of journals and the concomitant static or shrinking library budgets. The argument was that research funders were paying for the research to be done, and then paying again to be able to read the results of that research. There was also a sense that the publishing behemoths were controlling an increasing proportion of the market and that, by changing the financial model, this control would cease to exist.

In 2018, cOAlition S, a consortium of principally European Union-based research funders, issued their so-called ‘Plan S’. Plan S “requires scientists and researchers who benefit from state-funded research organisations and institutions to publish their work in open repositories or in journals that are available to all by 2021.” In 2020, the debate surrounding this goal is ongoing.



The White House (Obama administration) Office of Science and Technology Policy (OSTP) (2013) directed federal agencies which had budgets in excess of \$100 million per year in research and development spending (e.g., Department of Energy, National Science Foundation, National Institutes of Health) to develop plans to make the published results of federally funded research freely available to the public within 0–24 months of publication, based on the topical discipline and depending on the national agency. At present (Trump administration), a revision of that policy is being considered. The sense is that the 12-month embargo will be removed and that research (as described above) will have to be made publicly available immediately after publication, though with a period of transition: a time range from 0 to 36 months is being considered.

In 2013, there were two primary kinds of OA publishing:

**Gold OA:** authors or their funders pay an author publication charge (APC) to cover the costs of publication of a paper in an OA or hybrid journal (i.e., one that mixes traditional subscription with OA).

**Green OA:** the author has typically not paid an APC but, after a certain embargo period, the published paper can be made available via a freely accessible, author-managed webpage or institutional repository.

1 A full-length open access version of this article is available from at <https://doi.org/10.1180/mgm.2020.58>. This includes a comprehensive glossary of terms, details of an informal survey of *Elements*’ publishers and the reference list, among other aspects.

2 Mineralogical Society of Great Britain & Ireland  
E-mail: kevin@minersoc.org  
Orcid ID: 0000-0002-8959-6765

3 Cambridge University Press  
E-mail: abjohnson@cambridge.org  
Orcid ID: 0000-0001-6272-1506

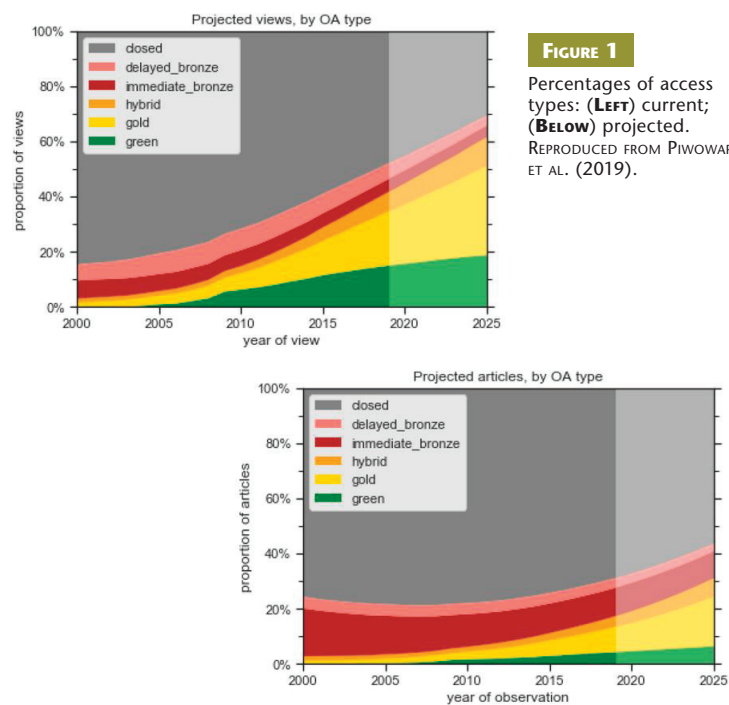
There are also more recently introduced terms related to OA. “**Platinum OA**” for which journals don’t charge any APCs and fund the journal in another way, such as through a university or research organization. “**Diamond OA**” for which journals do not charge any APCs either, but the work is often done on a voluntary or ‘in-kind’ basis, so there is no need for payment.

## WHAT HAS BEEN THE IMPACT OF OPEN ACCESS OVER THE PAST SEVEN YEARS?

Because of the way in which OA was funded over the past seven years, the traditional subscription model has continued to exist, with a minority of OA funding made available to publish works in OA or hybrid journals. This financial status is not sustainable. It requires more money than was available previously.

The number of full OA journals has burgeoned. In March 2020, the Directory of Open Access Journals (DOAJ – <https://doaj.org>) listed 14,348 journals which have published >4.7 million articles between them. In 2003, DOAJ was launched with just 300 journals.

According to Piwowar et al. (2019), 31% of all articles were available in 2019 as OA, and 52% of views were to OA articles. Those authors estimated that by 2025, 44% of all articles will be available as OA, with 70% of all views to OA articles (Fig. 1). This is clearly an increasing trend.



## Predatory Journals

With the very large number of OA journals has come a number of so-called predatory journals. These are journals which publish papers without appropriate (or any) peer review, or without checks in terms of plagiarism or ethical matters. (See the now-defunct Beall’s List of predatory publishers at <https://beallist.net/>.) These journals take up scarce resources and sow doubt and confusion in the literature.

Cont’d on page 299

## WHAT IS NEW IN 2020?

Plan S and rumblings from OSTP in 2018/2019 have encouraged publishers to move more quickly than had previously been the case.

There are many challenges with Plan S, including the points outlined in the American Chemical Society's statement, published in February 2019 (prior to some revision by cOAlition S):

- Hybrid journals provide a clear path to achieving full and immediate open access—yet are considered 'non-compliant' by Plan S.
- Restricting Plan S authors to a current small sub-set of established OA journals risks stifling scientific collaboration.
- Clarity around transformative agreements is lacking.
- A one-size-fits-all approach to article publishing charges (APCs) is problematic.
- The proposed timetable is impractical.

Not all publishers will have the same complaints. Some may be prepared to abide by the "reasonable level" APC being proposed by cOAlition S. An updated set of Plan S conditions was released in April 2020 (see below).

- What about authors who are not supported by a cOAlition S funder?
- What about authors who do research without financial support?

On 8 April 2020, cOAlition S announced updates to its criteria for transformative journals. Authors supported by cOAlition S funders must publish in journals which meet Plan S requirements. The changes are as follows:

- "The threshold when a journal must flip to full Open Access has moved from 50% to 75% and we have removed the commitment to 'flip' to OA by December 2024. In making these changes, however, we have stressed that publishers must explicitly state their commitment to transition to full Open Access and that our support for this model (in terms of paying for publishing services in subscription journals) will cease at the end of 2024 ...."
- "[Reduce] the annual growth target for the proportion of content which must be published in Open Access from 8% to at least 5% in absolute terms and at least 15% in relative terms, year-on-year."
- In July 2020, cOAlition S announced a 'Rights Retention Strategy', and all research published by those authors in receipt of financial support from cOAlition S funders will be subject to it. The intellectual rights to work published will no longer belong to the author or to the publisher but rather to the public. Though many authors are keen to promote their work as widely as possible (and many willingly sign CC BY licenses to publish, which allows unlimited sharing, copying and even translation of the work, even to the extent that others may benefit financially from it), others may resent the imposition of this license upon them by funders and removal of the option to choose how their work is used by others (Anderson 2020).

In a move which may well be related to the latest cOAlition S pronouncement, the European Research Council (ERC) has withdrawn its support for Plan S.

## IMPACT OF OPEN ACCESS ON STAKEHOLDERS

### On Publishers

Publishers have been required to turn on its head the financial model used in journal publishing for centuries. In the past 20 years, the ability of publishers to carry out their function has been threatened by the demands/implications of OA. Publishers are scrambling to survive.

Can small publishers survive in the world of 'Read and Publish'/'Publish and Read' deal-making? Will there be space outside of those deals in which they can continue to exist if they cannot make such deals (Harington, 2017)?

### On Learned Societies

Open access 'tipping points' are causing change throughout scholarly communities. The present authors (representing learned societies) join others in trying to document and to plan amidst a changing landscape. Some societies have taken the view that society OA journal publishing should be an extension of the society's mission, via Diamond Open Access (Harington 2017). Others with existing subscription portfolios are embracing OA while not discarding the historic role of societies and their journals' place in championing science. While the future may be open, they rally their members: "we keep in mind and advocate for the traditional strengths of our peer reviewed publication system: institutional support for publishing, editorial decisions made by practicing scientists, and placing scientific rigor over financial exigencies" (Piston 2019).

Learned society publishers are a subset of the publisher group. Many small learned society publishers are less well-resourced in terms of their abilities to respond to and deal with the implications of a drive towards full OA publication. How do we adjust our modus operandi to allow us to continue to operate and to ensure a fair share of the library budget pie?

### On Funders

Funders (governments, national scientific agencies [e.g., NERC in the UK, or NSF in the USA], or charitable agencies such as the Wellcome Trust, Bill and Melinda Gates Foundation) would like to see all published research made available to all, free of charge. But how do we achieve that without killing the messenger, i.e., the publishers/societies?

### On Readers

We will, ultimately, arrive at a situation where any reader anywhere will be able to access almost any piece of published content they wish. But will readers be able to rely on what they read? Can the system maintain review and production quality? Can we avoid the "predator pitfall" mentioned above? Will we, the general public, benefit from being able to access all of this content? Maybe.

### On Science

Open access in a digital world fosters dissemination of knowledge and scientists' collective ability to collaborate and accelerate the pace of research and to problem solve. Open access content is, on average, downloaded ten times more than that which is behind a paywall. According to Piwowar (2018), OA articles are cited, on average, 18% more than non-OA articles.

### On Authors

Throughout the twists and turns in the 20 years of the OA saga, some authors have, arguably, been least engaged in OA. This silent majority of authors, no matter their sympathies and desires to propel OA change, default to the path of least resistance in publishing through traditional subscription journals.

## ELEMENTS PUBLISHERS

Several of the societies/associations involved in the *Elements* family are also journal publishers in their own right. A brief, informal survey of their views of the OA movement was conducted amongst those colleagues. Within this small sample group, we have journals with

Cont'd on page 300

commercial/not-for-profit publishing partners and journals which are published independently. We have journals which range from purely subscription-based to hybrid (with 0–10% OA content) to journals which are 100% OA. Other than those journals which are already fully OA, only those with commercial or other partners view themselves as being on a path to mostly or fully OA. It is clear that all society publishers would wish their content to be available to as wide an audience as possible. Societies which can afford Platinum OA welcome the move, as do those which have already transitioned to OA and are glad of the support for this kind of publication. Some (most) of the publishers still involved in hybrid publishing do not appear, as yet, to be considering more OA-rich solutions. Within the context of the survey carried out, none of the *Elements* publishers who responded sees the current OA 'heave' as an existential threat.

### CASE STUDY

In 2019, the University of California, which has 10 constituent universities, cancelled its 'big-deal' subscription with Elsevier.

Researchers at the University of California publish, on average, 50,000 journal papers per year. The library budget is \$40M. Before 'Read and Publish' deals existed, a further \$10M per year was spent on APCs. Under the terms of the 'Read and Publish' deal, the University of California asked authors to make the decision about where to publish (offering them much-sought academic freedom) and will support APC fees. Because authors are also asked to help with APCs where possible, they will be partly responsible for finding the best APCs. In April 2019, the University of California entered into its first OA 'Read and Publish' agreement with Cambridge University Press.

### WHAT IS THE FUTURE?

The version of OA which has been in vogue since 2013 has not led to the bulk of content being available to all because there is not enough money out there in the world of libraries to pay for subscriptions and open access (at the same time). The temporary answer – pre-publication and Green OA – has not worked either.

The numbers of OA papers published (and attendant revenue) are increasing, whether in hybrid or Gold OA journals.

#### *Transformative Deal*

One viable solution, which could work, is that which transforms subscription money into OA money (to put it very simply). In Plan S terminology, deals based on this solution are referred to as "transformative". Forward-looking, mostly larger publishers, have been quick to negotiate with libraries and consortia (e.g., the University of California) to come up with deals which do that. The deals vary from one publisher to the next, but, for the most part, allow authors to publish OA papers in those journals without additional cost to them or the institution.

From a university press publisher's perspective, Cambridge University Press has transformative deals in place with 28 entities (Cambridge Core: <https://www.cambridge.org/core/services/open-access-policies/read-and-publish-agreements>.)

At a national level, the German government has put in place 'Projekt Deal (2020)', for which the stated objectives are immediate OA publication of all new research articles by authors from German institutions, permanent full-text access to the publisher's complete journal portfolio, and fair and reasonable pricing for such services articulated with a simple and future-oriented model based on the number of articles published.

So, moves and negotiations at all levels. But the following questions remain:

- Is 'Read and Publish'/'Publish and Read' likely to instigate the aforementioned tipping point?
- Will a significant proportion of the international subscription budget remain as money allocated to subscriptions?
- Will it be possible for one- or two-journal publishers to respond adequately, i.e., negotiate 'read and publish'-style deals with subscribers?
- Will libraries want to negotiate with small society publishers?
- What about institutions which cannot afford either subscriptions or APCs? They will benefit from the OA secured by other institutions, but local authors will have to find journals which do not require APCs (i.e., their content will be behind a paywall).
- What of libraries at institutions that do a lot of teaching but little or no publishing? Why would they continue to pay subscriptions if, as more institutions sign up, a greater proportion of content becomes OA?

### WHO IS RESPONSIBLE FOR WHAT?

Some **funders**, such as those in cOAlition S, have gotten off the fence and forced publishers into action. What about other funders?

Many **institutions** are keen to change the ancient paradigm (subscription-based existence) and to move past the hybrid-journal idea. Neither solution is working, and, in many institutions, readers are left without access to key content because of budget and other restrictions. Key participants have taken a brave step. Will others follow?

**Publishers** are more cautious. Those with greater resources and larger teams of staff are better placed to move with the changing landscape. Smaller publishers will wait until the picture becomes clearer. Will there still be time to secure some of those precious library resources if we do reach that OA tipping point? There is an irony here: the move to OA to reduce the impact of the very large commercial publishers has had the opposite effect. Society publishers which have joined forces with commercial or not-for-profit partners are, perhaps, the most likely to be ready when the tipping point (between subscription-based and OA publishing) is reached, if it is reached.

**Readers** have always been very resourceful. They obtain a copy of the content they need by asking the author for it, by paying to download it, or by obtaining it from a site where it is hosted illegally. Everything on the internet is free isn't it?

And, finally, **authors** have a significant responsibility here. What is it you would like? Does "the right to publish your work in a good-quality journal with high peer-review standards, decent review times and good access to an appropriate audience (best assured by Open Access)" sound right? If, as an author, you struggle to meet all of the criteria above, at a price you and your institute can afford, then perhaps consider changing your publishing habits.

### SUMMARY

The view of the present authors is that we are reaching critical mass in terms of OA. No longer will the majority be able to continue to rely on the traditional subscription funding model with OA simply a bit-part player. Open access will certainly be a significant part of the future. Both cOAlition S and the OSTP have made significant moves, but they have not been backed by some of the other major powers in the world of science publishing. All eyes are on China: to date, it has broadly supported OA movements such as Plan S, but it has not yet made any firm commitment. And the future may yet depend on moves by visionaries, publishers and libraries who might see a different future.