

Transformation: the future of society publishing

The release in September 2018 of Plan S has led many small and society publishers to examine their business models, and in particular ways to transform their journals from hybrids into pure open access (OA) titles. This paper explores one means by which a society publisher might transform, focused specifically on the institutional set-price publish and read (P&R) package being developed by the Microbiology Society based on assessments of: the geographic diversity of our author and subscriber bases; trends in article numbers, article costs and revenues; the administrative complexity of the options; and the reputational and financial risks to the Society associated with the package. We outline the process we followed to calculate the financial and publishing implications of P&R at different price points, and share our view that these kinds of packages are a stop on the way to new models of OA that do not rely on article processing charges (APCs). Our hope is that in sharing our experience, we will contribute to a collective best practice about how to transform society publishing.

Keywords

Open access; Plan S; publish and read; society publishing; transformative agreements



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Transforming – the journey so far

The Microbiology Society is a membership charity for scientists interested in microbes, their effects on our world and their practical uses. It is one of the largest microbiology societies in Europe, with a worldwide membership based in universities, industry, hospitals, research institutes and schools.

In 1947 the Society created *Journal of General Microbiology*, now known simply as *Microbiology*, followed by *Journal of General Virology* in 1967. Two additional subscription journals joined the portfolio over the following decades: *Journal of Medical Microbiology* and *International Journal of Systematic and Evolutionary Microbiology*, the latter in partnership with the International Committee on the Systematics of Prokaryotes. More recently we have launched two new open access (OA) journals, *Microbial Genomics* and *Access Microbiology*. Throughout our 70-year history of publishing we have maintained our independence, which means our Publishing Committee and Council set the publishing agenda without needing to seek consent from an external publishing partner.

2 This independence has been key to our publishing activities and policies. For example, the Society's vision is a world in which the science of microbiology provides maximum benefit to society, and this vision has set our approach to open access and open scholarship (in our case including data, algorithms, genome sequences, and so on). We offer our authors multiple routes to OA,¹ with the twin goals of ensuring that authors who do not have access to publication funds are not disenfranchised, and that we offer the maximum possible reader access to research.

Avoiding the cliff edge

The release in September 2018 of Plan S by cOAlition S, a group of mostly European funders, was a clear statement of intent towards disrupting the publishing status quo.² With this in mind, the Microbiology Society collectively brainstormed a set of ten options for future business models (Figure 1), considering the geographic diversity of our author and subscriber bases; trends in article numbers, article costs and revenues; the administrative complexity of the options; and, critically, the reputational and financial risks to the Society associated with each option.

'Plan S by cOAlition S, a group of mostly European funders, was a clear statement of intent towards disrupting the publishing status quo'

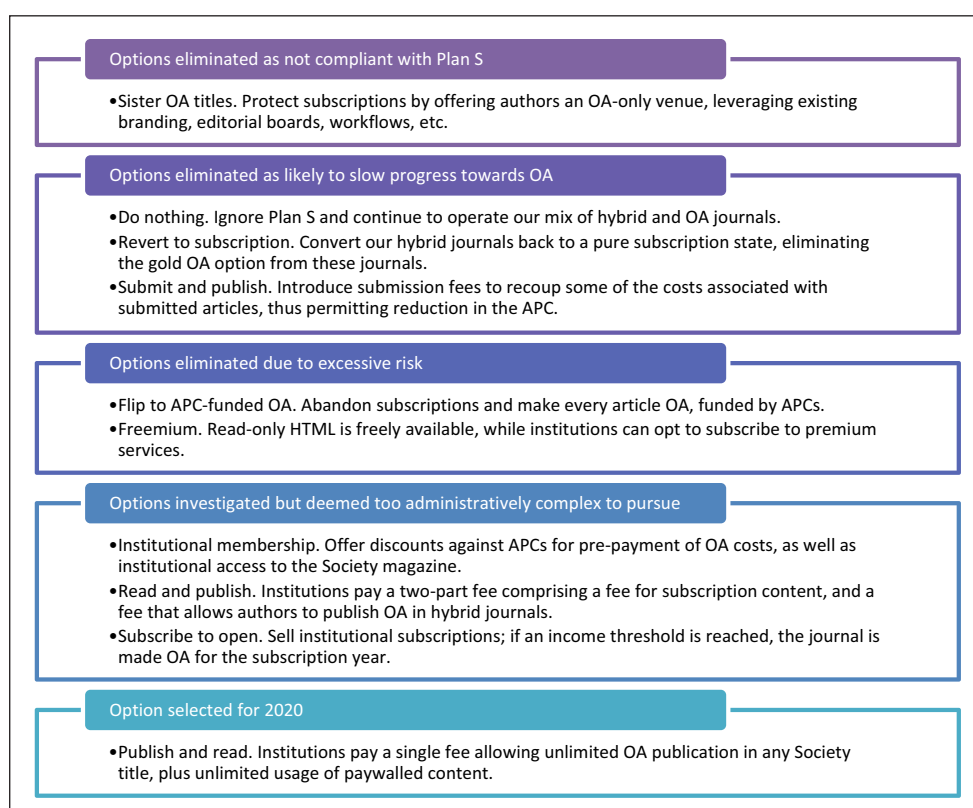


Figure 1. Business models discussed internally following the release of Plan S

Our goal is to work towards an OA future, so some of these options were rejected as retrograde steps, including 'revert to subscription', 'submit and publish' and 'Do nothing'. Guidance on the Implementation of Plan S published in February 2019 and updated in May 2019³ helped us to exclude other options, such as 'sister OA titles' (mirror journals), that we might otherwise have viewed as serious contenders for an OA future.

With several options eliminated we assessed the feasibility of four remaining models – institutional membership, read and publish, subscribe to open, and publish and read. During this assessment we took into consideration the proportion and distribution of OA across our journals. Gold OA accounted for 13% of articles published across the Society's portfolio in 2018 but represented less than 7% of our journal revenue. The distribution of OA across the portfolio was not even: two of the journals are pure gold, publishing 100% OA content, while four of the journals are hybrid, publishing between 1.4% and 17.5% OA content. The OA journals are growing in output, while our hybrid journals are broadly static year-on-

3 year. To complicate things further, our author base is geographically disparate (Figure 2), with less than 30% of corresponding authors based in countries with strong OA mandates; this is reflected in our subscriber base. Every scenario that we modelled resulted in uneven progress towards OA, with two of our hybrid journals reaching 50% OA five or more years before the others.

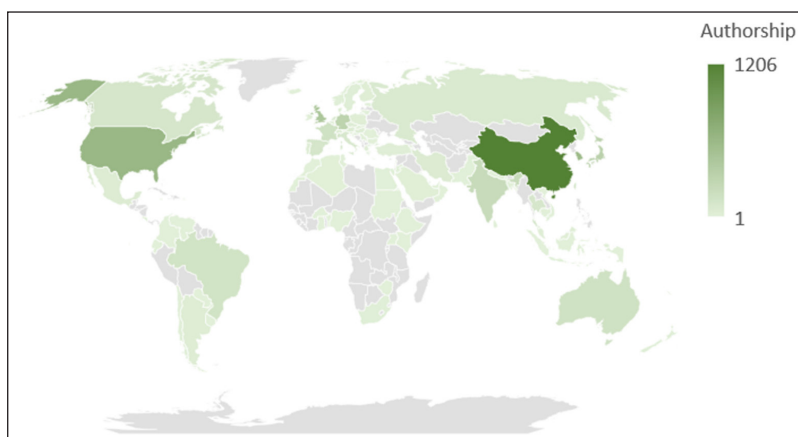


Figure 2. Geographic distribution of corresponding authors in Microbiology Society journals, 2016–2018. The intensity of colour indicates the number of authors in a country

'Every scenario that we modelled resulted in uneven progress towards OA'

For the moment, publishers will continue to operate in a mixed economy. They will do so because there is a lack of consensus among funders and institutions globally on the subject of OA; because their imperative is to publish the best research in the fields in which they operate, regardless of provenance or ability to pay; and because an overnight flip to a radically different business model is an untenable risk to any publishing model, whether charitable or for-profit.

It therefore became clear that in our case, at least, any sustainable transition towards OA would require a continuum of business models. (We define sustainability across two criteria: finances, and the ability of all authors to publish in our titles without financial barriers. A shift to a pure article processing charge (APC)-driven OA model would be considered unsustainable under the second criterion.). We mapped out one possible version of the continuum (Figure 3), which is the version that we deem most appropriate for us as the landscape stands today. It is probable that changes in funder mandates, institutional purchase arrangements and researcher demand will affect our future position; we will also take into account the experiences of other publishers who trial new business models.

'any sustainable transition towards OA would require a continuum of business models'

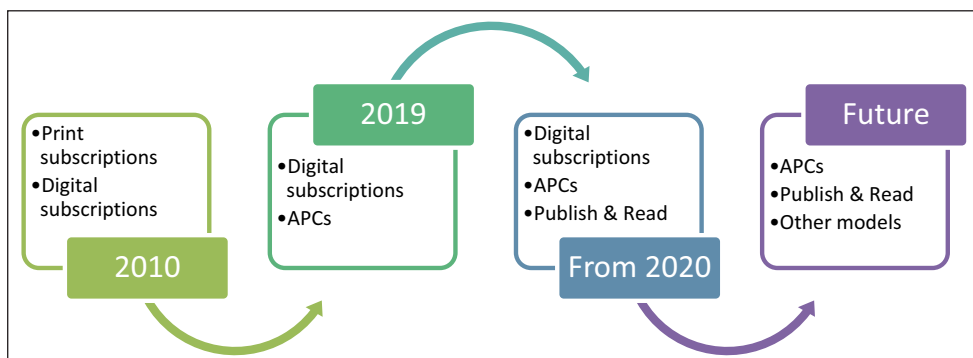


Figure 3. A continuum of business models

While the Society is clearly an enthusiastic participant in the drive for an OA future, the nature of small society publishing limits the resources we have to enter into many-to-many negotiations or to administer complex transitional arrangements such as those exemplified by the agreement between Wiley and Projekt DEAL.⁴ As a pragmatic first step, therefore, we have engaged with a small number of consortia in 2019 and focused our attention instead

on a set-rate publish and read licence. This paper outlines the modelling process we used in developing the licence, and we hope that it will provide insight and interest in a pragmatic and methodical response to a critical moment in our publishing history.

Publish and read

As Figure 3 shows, from 2020 we will be offering a P&R package designed to deliver a frictionless OA experience for authors together with maximum value for institutions:

- **Unlimited OA:** any article published in a Society journal where the corresponding author is from a P&R institution will be OA by default.
- **Unlimited usage:** any user associated with a P&R institution can access the entire archive of Society content, back to 1947, for reading and for text and data mining.

We decided to make our P&R package available both to single institutions, via a flat-rate package with set terms that can be purchased through institutions' preferred agents, and to consortia around the world. At the time of writing, consortial P&R deals are being proposed and under negotiation, running alongside the SPA-OPS efforts to develop a set of principles covering consortia model transformative agreements for Society publishers – a welcome effort if it can achieve standard practice and reduce lengthy discussion.

For both consortial and institutional P&R, we have committed to allowing corresponding authors to opt out of OA without requiring permission from their administrator, and (where technology permits) to reporting on OA publications covered by the package on a regular basis. We believe this offers the best balance between minimal friction – we do not need to seek permission for each article published – and individual choice on the part of the authors.

'For ... P&R, we have committed to allowing corresponding authors to opt out of OA'

Pricing and modelling

The data presented in this section are for the purposes of illustration and do not reflect actual Microbiology Society numbers.

Several pricing principles guided us in developing our P&R package: we needed to be able to provide transparent, cost-neutral pricing to encourage our institutional customers to take up the package; we needed to back up prices we were recommending with rigorous modelling and analysis; and any pricing had to be sustainable over at least a five-year period.

One of our goals in offering single-institution P&R packages is to allow institutions to continue purchasing through their preferred agents. Maintaining existing sales channels removes friction for our library customers and, given agency sales account for over 85% of our subscriptions, means we need not redesign our entire sales channel. To do this we needed to set a flat rate using current pricing as our starting point, and to have simple terms that would not require additional paperwork on the part of the agents.

'any pricing had to be sustainable over at least a five-year period'

Step one: identify the market

Our first P&R package is focused on academic institutions, meeting two criteria: (1) subscribing to any of the hybrid journals and (2) with faculty who publish in any of our journals including the OA titles. We did not factor in our subscription tiering or typical distinctions between academic institutions of different sizes versus corporates or government agencies. While this simplification is a constraint in our work, it does enable us to model the effects of P&R at a high level.

Having decided on our market, we extracted information about total publishing revenues from those institutions in the form of total spend (subscription plus APC) with the OA spend averaged across the years 2016, 2017 and 2018. As different institutions spent very different amounts, we subdivided the group into quartiles (Table 1).

	Description	Total revenue	Mean spend per institution
Quartile 1	One or two subscriptions plus one or two APCs	£375,000	£3,000
Quartile 2	Three subscriptions plus APCs or four subscriptions	£875,000	£7,000
Quartile 3	All hybrid journals plus one or two APCs	£1,125,000	£9,000
Quartile 4	All hybrid journals plus three or more APCs	£1,375,000	£11,000

Table 1. Annual spend among engaged institutions, given a hypothetical 125 engaged institutions per quartile

Step two: test pricing

With our market identified, our next step was to examine the impact of different P&R package prices on revenues in 2024 (i.e. in the fifth year of offering P&R). To keep calculations as simple as possible we made the following assumptions, which we acknowledge to be limitations to accurate modelling:

- no change in the numbers of engaged institutions
- no change in the mean spend of engaged institutions not taking up P&R package
- no change in the price of the P&R deal.

As part of the modelling, we created rules to account for different levels of uptake of P&R packages, with uptake dependent on the variance between current mean spend per institution and the P&R package price (Table 2).

Variance from current spend	Uptake
Increase more than £3,000	0%
Increase £2,000–£3,000	5%
Increase up to £2,000	15%
Equal price	50%
Saving up to £1,500	75%
Saving £1,500–£2,500	85%
Saving more than £2,500	95%

Table 2. Rules for uptake of P&R packages depending on how much the price varies from current spend

With these rules in place, we started assessing potential uptake of P&R packages and the associated revenue implications compared with current spend (Table 3). We modelled a P&R package priced at the level of spend in each quartile of engaged institutions, as well as at £8,000.

	Institutional uptake*	P&R revenue	Non-P&R revenue	Total revenue	Variance from current revenue
P&R at £3,000	420 (84%)	£1,256,250	£356,250	£1,612,500	–£2,137,500
P&R at £7,000	288 (58%)	£2,012,500	£1,050,000	£3,062,500	–£687,500
P&R at £8,000	232 (46%)	£1,850,000	£1,468,750	£3,318,750	–£431,250
P&R at £9,000	188 (38%)	£1,687,500	£1,887,500	£3,575,000	–£175,000
P&R at £11,000	82 (16%)	£893,750	£2,893,750	£3,787,500	£37,500

*Numbers of institutions opting for P&R were calculated for each quartile of spend, with the number rounded down to the nearest integer

Table 3. The impact of P&R on revenues at different package price points

A one-price-fits-all approach will not be suitable for all our customers, but given the size of the Society and our limited resources, we are not able to implement tiered pricing during the initial trial period of P&R. The revenue implications associated with pricing P&R at £3,000 (for the complete P&R package) were too significant for us to consider moving forward with that as our single, fixed price-point, so while it is included here for completeness, we eliminated it from further consideration. From a purely financial perspective, a price of £11,000 – equivalent to the mean spend of engaged institutions in quartile 4 – was the only option predicted to return a positive financial performance. As most such institutions are

6 corporate or government customers, less affected by Plan S than academic institutions, this price point is not likely to have the desired effect of moving us towards an OA future. Should the P&R trial prove successful, we will consider introducing additional tiers of P&R packages to accommodate a greater range of institutions.

Step three: check P&R against subscription

Having identified the revenue implications of P&R, we turned our attention back to subscription attrition modelling undertaken during 2017. This applied the average attrition rate from the period 2010 to 2016, by quartile, and projected those trends forwards to 2024. We were thus able to compare estimated revenues under a subscription model with the P&R modelling described in this article. The potential reduction in revenue for the different models is compared in Figure 4.

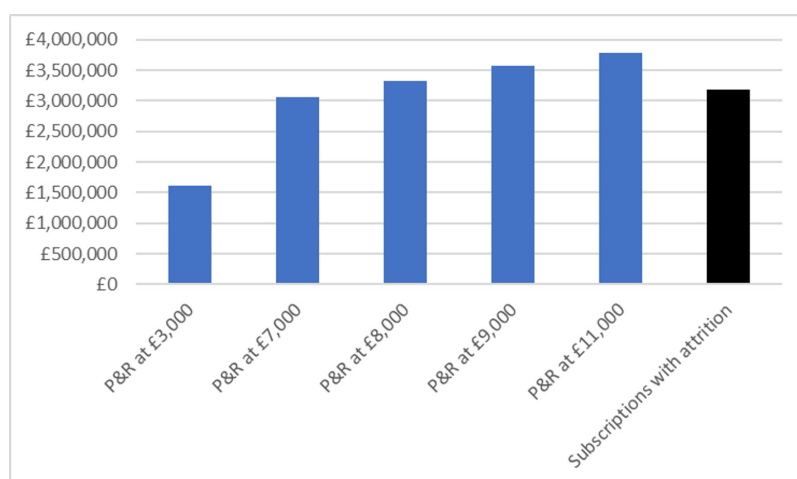


Figure 4. Revenues from P&R compared with subscription attrition

It is clear here that a P&R package price of £8,000 or £9,000 could help to buffer the Society from the reduction in revenue we anticipate from subscription alone.

Step four: publishing impact

Referring to our mission, finances are not the be-all and end-all of society publishing: we publish so that the science of microbiology provides maximum benefit to society, meaning that we should be aiming to publish more work as openly as possible, while covering the costs of publishing (£1,100 per published article in 2018). This led us to examine the rates of publication of paywalled as well as OA articles from our engaged institutions. We anticipated that we would find a correlation between average spend per quartile and publication rate, but in fact there was a difference of only one published article per year between quartiles 1 and 4, though engaged institutions in quartiles 3 and 4 were more likely to be publishing two or more of these papers OA through payment of APCs. This led us to propose a baseline of two additional OA papers per year per P&R package. If one assumes that the additional OA articles follow the current distribution of OA across our portfolio, there are two journals which could conceivably reach 50% OA by 2024, unless there is an increase in publication rates for paywalled articles (Table 4).

'finances are not the be-all and end-all of society publishing ... we should be aiming to publish more work as openly as possible'

	OA % in 2018	OA as % of journal in 2024 under different P&R package prices				
		£3,000	£7,000	£8,000	£9,000	£11,000
Journal 1	16.95%	72.32%	49.72%	40.11%	32.20%	14.12%
Journal 2	22.48%	94.95%	65.14%	52.75%	42.66%	18.35%
Journal 3	5.41%	23.17%	15.83%	12.74%	10.42%	4.63%
Journal 4	1.38%	5.91%	3.99%	3.30%	2.61%	1.10%

Table 4. The impact of P&R on the proportion of OA in the four hybrid journals in the Microbiology Society portfolio

7 **Step five: price recommendations**

Taken together, the financial and publication implications of the different P&R pricing scenarios led us to recommend a price of £8,500 per institution to our Council, allowing us to offer discounts to consortia while maintaining a sustainable level of journal revenue. As a point of comparison, academic institutions subscribing to all four hybrid journals would be charged £5,771 in 2020, while APCs for the hybrid journals are set at £2,100. The recommendation was accepted as offering a good balance between fairness to our engaged institutions, increased OA publications and manageable implications for our finances in 2024. There are of course caveats – for example in April 2019 we launched a new OA journal, *Access Microbiology*. We will monitor publications in this journal by institutions which purchase P&R and adjust pricing accordingly from 2021.

'a price of £8,500 per institution ... allowing us to offer discounts to consortia while maintaining a sustainable level of journal revenue'

Market reaction

Before launching the P&R package, we needed to test the market by speaking to some of our target institutions. At the time of writing (August 2019) feedback indicated that:

- half of institutions are familiar with P&R and many have transformative deals, usually via consortia; transformative deals including P&R are reported to be rare outside Europe
- 37% of respondents were positive towards the P&R model we described, and only 13% of respondents were not interested at all. Most felt that the combination of flat rates with unlimited publication and removal of payment barriers for authors was likely to encourage a rapid transition towards OA
- interested institutions requested more information about corresponding authors from their institutions, who would benefit from P&R. Over the period 2016 to 2018, corresponding authors from interested institutions had published an average of four articles in Society journals, with an average of seven additional articles as co-authors
- 16.7% of respondents mentioned specific budget obstacles, including a split between their subscription and OA budgets, while only 22.2% said that they did not anticipate any budgetary obstacles to P&R.

'We continue to seek feedback from institutions and intend to offer institutional P&R from 2020'

We continue to seek feedback from institutions and intend to offer institutional P&R from 2020, despite the updated cOAlition S implementation guidance pushing back the launch of Plan S to January 2021.⁵ With more customer feedback and experience of selling this concept, we expect development of variations and tiering that will permit us to bring in other categories of institution, from the largest corporate and government subscribers to the smaller academic and college hospital subscribers.

Other models

In Figure 3 we outlined our proposed continuum of business models, which suggested that new models would be needed beyond P&R. When looking at the potential for P&R to reshape the profile of OA in our journals, we thought about how we might manage one or more of the journals reaching 50% OA – a point at which we deem it likely that many institutions not covered by a P&R package would be likely to cancel a subscription. As shown in Table 4 above, this may well occur for two of our titles in the next few years. At this point in time, we have not made any decisions about what exactly we will do once such a threshold is reached.

'there are real risks associated with reliance on APCs'

It is commonly assumed that publishers should flip journals from a subscription model to APC-driven OA, possibly in combination with P&R packages, but there are real risks associated with reliance on APCs, not least a substantial drop in submissions from authors

8 who lack OA funds. One alternative is to ask subscribers to pledge to maintain their subscription, while the publisher commits to converting the journal to OA provided a base level of funding is achieved. We will be watching the *Annual Reviews* experiment with interest.⁶ To use their explanation:

'Subscribe to Open converts gated access journals to open access using existing library relationships and subscription purchases. Institutions that already know and value *Annual Reviews* content simply continue to subscribe – there are no APCs or other additional costs – and as long as subscription revenues are maintained, the year's volume will be published open access and the back volumes made freely available. If subscription revenue is insufficient to cover costs, for example as a result of institutions deciding to "free ride", the journals will remain gated access. Thus, Subscribe to Open is a subscription offering, but one that empowers libraries to maximize the impact of their collection budgets by supporting the open access publishing of highly valued content.'

By introducing cross-portfolio P&R followed by subscribe to open for specific journals, we can match researcher, institutional and funder demands for OA while ensuring that no researcher is prevented from publishing by lack of OA funds. However, there are outstanding questions as to whether subscribe to open is sustainable, and if it meets the requirements of Plan S in the longer term.

The future for society publishers

Some of the largest commercial publishers no longer describe their principal goal as 'publishing'. Elsevier is a 'global information analytics business'; Wiley develops 'digital education, learning, assessment and certification solutions'. Operating at this scale, companies can diversify their income by acquiring technology solutions and workflow companies. Society publishers are equally cognisant of the risk of over-reliance on one source of income and many have mitigation strategies in place. With more modest means, the small to mid-sized society publisher cannot exploit the opportunities open to large, deep-pocketed corporate entities, even if they were minded to.

The research community is still growing, with new niche areas developing and giving rise to new journals on a regular basis. For many researchers, institutions, funders and publishers, the impact factor still rules, recognizing journal brands rather than rewarding the merit of individual articles or researchers. From an OA perspective, many academics – the primary actors in journal publishing as authors, reviewers and editors – are either disengaged, uninterested or bemused by the nuances of OA. It is not clear what influence institutions, funders and libraries will have on researcher behaviour as Plan S becomes operational.

What has changed with the release of Plan S is the impetus to re-evaluate change and the pace of change. Consortia, institutions, funders and other intermediary stakeholders are joining with publishers and with small societies as well as with other stakeholders to examine alternative routes to OA. Publishers are renewing attempts to develop new business models to protect revenue in a world where the reality is that OA delivers less financial cushion and predictability than the traditional subscription model.

'many academics ... are either disengaged, uninterested or bemused by the nuances of OA'

The message, not the medium

Academic life will continue to rely on trusted publishing venues. Whether that is a traditional journal, a mega-journal like PLOS One,⁷ a platform like F1000,⁸ or something completely different, societies have an opportunity to reclaim their place as trusted, valued players in the research communication space. To make the most of that position, we will have to shift our focus in line with the goals of open scholarship, delivering services, not products.

9 We believe that OA is important, but that research culture and society mission are stronger drivers. We are OA advocates in so much as OA achieves the goal of enabling effective and collaborative open scholarship: we do not know what we should transform into, but we do need to respond to our environment. Darwin's words are prescient as we seek ways to transform: *In the long history of humankind (and animal kind, too) those who learned to collaborate and improvise most effectively have prevailed.*

'We believe that OA is important, but that research culture and society mission are stronger drivers'

Acknowledgements

With thanks to Justin Clark, Peter Cotgreave, Nicola Davies and Joanne Morley for reviewing the work, and to the Officers and Chair of the Publishing Committees of the Microbiology Society for their permission to publish this article. We also wish to thank the reviewers for their helpful comments.

Abbreviations and Acronyms

A list of the abbreviations and acronyms used in this and other *Insights* articles can be accessed here – click on the URL below and then select the 'full list of industry A&As' link: <http://www.uksg.org/publications#aa>.

Competing interests

The authors have declared no competing interests.

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To cite this article:

Mellins-Cohen T and Redvers-Mutton G, "Transformation: the future of society publishing," *Insights*, 2020, 33: 1, 1–9; DOI: <https://doi.org/10.1629/uksg.486>

Submitted on 11 September 2019

Accepted on 18 November 2019

Published on 08 January 2020

Published by UKSG in association with Ubiquity Press.