THE ROYAL SOCIETY

Future of scientific publishing

Summary note of a conference held on 14 – 15 July

Background

Researchers, publishers, funders, librarians and others met at the Royal Society on 14 – 15 July 2025, to discuss the future of scientific publishing. The research landscape is far larger now than it was when the current journal system was introduced, with increasing pressure to publish for career advancement. Technology has helped to make knowledge sharing faster and more international, but the emergence of generative AI has also raised concerns about the reliability of the literature.

The purpose of this meeting was to have a discussion on the interlinked topics of publication financing, custodianship, trustworthiness, information discovery and the evaluation of academic achievement. These issues are not new, but the current political situation in the United States and a cyberattack on the British Library in 2023 further add context to the meeting.

This note provides a summary of some of the key messages that were delivered over the two days and is not intended as a verbatim record.

The role of scientific publishing

"Research isn't complete until it's published", said Sir Mark Walport FRS, Foreign Secretary and Vice President of the Royal Society. But he added that "peer review is creaking under pressure".

Peer review only became popular after World War II, noted Professor Aileen Fyfe, of the University of St Andrews. She also pointed out that many of the changes in publishing practices over the years have been "changes in communities" as research evolved to be more global and specialised.

Throughout the meeting, discussions often returned to the tensions caused by the dual role of scientific publishing as both a way to disseminate knowledge and as a career assessment tool. However, it's challenging to find solutions that fit everyone, because there are many different users and stakeholders in the current publishing system.

Above: Sir Mark Walport FRS, Foreign Secretary and Vice President of the Royal Society.

What researchers need

Early career researchers may feel the need to publish quickly to ensure career progression and to share cutting-edge research, said Dr Sophie Meekings, Royal Society Dorothy Hodgkin Research Fellow at the University of York. This can be at odds with the needs of their supervisors, who may prefer slower publication in more prestigious journals.

Researchers at any career stage need trustworthy archives of knowledge, but Professor Bill Sutherland FRS, University of Cambridge was concerned about a "flood of literature curated by AI". However, he also showed how AI can help researchers rapidly build reliable summaries of research topics from the literature.

Sutherland and others also pointed out that researchers need fair credit for the work they do, including for data production and reuse, and they need to be able to afford to publish their research.

Above: Conference participants during the Q&A session.

Affordability also came up in a session about international differences, where Susan Murray of African Journals Online (AJOL) and Abel L. Packer of the Scientific Electronic Library Online (SciELO) shared how their publishing platforms keep publishing costs down while allowing researchers to share their work locally. That is especially important now that research has become a truly global endeavour. Even though most articles are published in English, Professor Vincent Larivière of the Université de Montréal showed that there are many publications in other languages which tend to be overlooked at an international level. Professor Jinghai Li ForMemRS, Institute of Process Engineering, Chinese Academy of Sciences (CAS), further proposed that translation of international literature can "promote real global readership".

There are also publishing differences between disciplines. In computer science, articles are submitted to conferences instead of journals, explained Professor Marta Kwiatkowska FRS, Department of Computer Science, University of Oxford. In mathematics, journal publishing is "incredibly slow" due to the need to check mathematical proofs, said Dr André Gaul of EMS Press. However, he added that "mathematicians have been embracing preprints for a very long time".

What other stakeholders need

Researchers are not the only ones who use the scientific literature. Publishers, libraries, funders and governments each rely on shared scientific knowledge in their own way.

Dr Amy Brand of MIT Press said that publishers want to support the needs of researchers and other stakeholders, but are themselves under pressure from "funding cuts, political attacks and profound changes in how knowledge is produced and consumed." Brand noted that publishers and researchers are both concerned about open access journal articles being used to train AI models "that can't preserve their context or argument".

A lack of clarity about expectations around AI was also a concern for libraries, said Dr Danny Kingsley, Director of Library Services at Deakin University. Libraries would further like more flexibility in choosing which journals they subscribe to or pay article processing charges for, but now often find their budgets tied up in subscription and journal packages that aren't serving their needs. Kingsley urged publishers to "come to the party in good faith and have a proper conversation".

Funders and governments, meanwhile, need to assess the quality of published work but also manage the increasing volume of it. Dr John-Arne Røttingen of the Wellcome Trust was one of several speakers to emphasise that the two purposes of publishing – knowledge sharing and assessment – are not aligned. It has led to a system where researchers find their work being judged based on the journals they publish in. "We have tended to substitute quality with brand value", he warned.

Toward a new publishing environment

Throughout the conference, speakers called for a separation of research dissemination and assessment. This would facilitate systems that are less focused on journals, but that would also require new ways of evaluation and quality control. Meeting participants discussed existing and emerging initiatives that reflect some of the ongoing changes in rapid, incremental research sharing, peer review and assessment.

Moving beyond journals and articles

"We've already moved beyond journals", said Dr Richard Sever of openRxiv. He pointed out that people look for articles by topical online searches, and that preprints have become more popular since the COVID-19 pandemic.

The way in which researchers interact with the literature and each other has also changed. Dr Ijad Madisch described how ResearchGate, which he founded, built a community on top of articles by allowing researchers to form connections. But that we still rely on journal articles to fulfil several different roles "drives a lot of the problems in the scientific world", said Baroness Alex Freeman of Octopus, who instead proposed analysing research data, methods and other outputs independently of the narrative of a journal article.

There are already multiple initiatives that explore new ways to share research beyond the traditional journal system. Some speakers predicted that we may end up with different systems for different needs and disciplines – a "system of systems" as Walport calls it.

Jason Priem of OurResearch envisioned an "open infrastructure" that exists "outside of the journal system", but also noted that filtering information in such a system will be especially important.

Not only will future systems need to be searchable, but the content needs to be carefully curated as well. Professor Ludo Waltman, Professor of Quantitative Science Studies at Leiden University, said that the way we now curate through peer review "is increasingly hard to maintain" and, like others, proposed decoupling publication and peer review.

Several speakers, including publishing representatives, agreed that the burden of stewardship of the academic record should be shared among stakeholders. Victoria Eva of Elsevier pointed out that publishers only have oversight on the research from the moment it reaches them. In another session, Dr Valda Vinson, Executive Editor for Science journals at AAAS, noted that researchers need to interact with their data long before they prepare for article publication.

Maintaining trustworthiness

To add a layer of trust to the academic record, some publishers are now shifting to a more open and transparent peer review system, which was largely supported by many at the meeting.

Dr Magdalena Skipper, Editor-in-Chief of *Nature*, said that "peer review is designed to make a paper better" and explained that this is why *Nature* has recently announced that it will make reviewer comments public to show the process of communication between reviewers and authors. Dr Bernd Pulverer of EMBO Journals, said that he has seen perceptions of transparent peer review change over the years, and that "very few opt out" of sharing referee reports at EMBO journals.

Above: Panel members (left to right) Dr Hylke Koers, Chief Information Officer, STM Solutions; Ms Kaitlin Thaney, Executive Director, Invest in Open Infrastructure; Mr Jimmy Wales, Founder, Wikipedia; and Mr Ian Mulvany, CTO, BMJ Group.

Trustworthiness of the scientific literature can also be managed through post-publication review on sites such as PubPeer. Moving the discussion away from the journal platform allows people to "focus on the content rather than where it is published", said PubPeer's founder Dr Brandon Stell.

Public discussion of research papers on sites such as PubPeer has flagged fraud and errors in the published literature, but science integrity consultant Dr Elisabeth Bik would prefer a more systematic way to prevent publication of these papers in the first place. She said that most peer reviewers are "not adequately equipped to detect fraud" and proposed an additional level of professional checks.

Technology solutions can also help to build trust in the research publishing system. For example, Dr Hylke Koers of STM Solutions said that technology can provide "infrastructure and standards" (such as digital identifiers) to enable reproducibility. But he also pointed out that such systems will need to be resilient and adaptable to the communities that use them. Wikipedia founder Jimmy Wales noted that "communities inherently scale". He shared that certain technological features at Wikipedia help maintain trust at scale, for example by being able to see the full edit history of pages.

Kaitlin Thaney of Invest in Open Infrastructure expressed concern about privatisation of research publishing solutions. She noted that there are often open-source solutions available that can be built on and called for a "healthy ecosystem" of public-private partnerships rather than large publishers acquiring small projects to "mine for parts".

Above: Conference participants during networking session.

Changing research assessment

This new ecosystem would also require re-evaluation of the way that research impact is measured. Dr Michele Avissar-Whiting, Director of Open Science Strategy at Howard Hughes Medical Institute (HHMI), said that besides decoupling dissemination from appraisal, researchers want incentives for data sharing, modular credit and transparent appraisal.

There was wide agreement that journal impact factors are not a suitable way to evaluate research. The Declaration on Research Assessment (DORA) and Coalition for Advancing Research Assessment (CoARA) both encourage organisations to find new ways of assessing research excellence that do not rely on journal impact factors. DORA's Vice-Chair Dr Rebecca Lawrence of F1000 said that there is still a lot of awareness building needed, as "uptake is slow", but she encouraged collaboration between organisations and to "actively support existing solutions".

Need for collaboration

At various sessions throughout the meeting, speakers repeatedly called for more collaboration between publishers, funders, research organisations and others. Dr Richard Gallagher, Editor-in-Chief of *Annual Reviews*, said that a "collective risk management" strategy is needed, and emphasised that this should be a "global conversation".

One of the problems that needs to be solved collectively is the economics of publishing. Professor Tomasso Valletti, Imperial College London, said that the profit margins of the largest publishers are very high and that this imbalance is maintained because people continue to want to publish in a small group of selective journals. At the same time, subscriptions are costly for many universities. Liam Earney, Managing Director for Higher Education and Research at Jisc, called for discussions on future publishing systems to "work within the limitations of institutions".

Several meeting participants, including Dr Mikael Laakso of Tampere University, proposed funding scientific publishing in a more collective way, similar to infrastructure or public utilities. It's an idea in line with a sentiment that kept returning throughout this meeting: that the future of scientific publishing should be collaborative and international. Open access publishing does reflect some of the values of the scientific community, but a few speakers mentioned that this system is fragmented and representing a wide variety of journals around the world.

Heather Joseph of SPARC sees science under "enormous pressure" in the United States and cautioned that some existing systems may break. However, she also added that this could be a chance for new opportunities and called for "trust in communities".

In his closing statements, Walport emphasised the "need to defend scholarship" and said that "if we want to sustain public appreciation of science, we need to do much better".