

Impact Objectives

- Investigate the challenges and opportunities of scholarly publishing over the past 350 years
- Use history to inform current policy debates around scholarly publishing, including open access and the future of peer review

Publishing the Philosophical Transactions

Professor Aileen Fyfe led a project examining the world's longest running scientific journal. She introduces her academic background, the research, and the implications of her findings



social, cultural and economic history of a learned journal, 1665-2015?

In 2013, my research team began working on the history of the Royal Society's Philosophical Transactions, which was due to celebrate 350 years in 2015. The Philosophical Transactions was already well-known in the history of science: it is both the world's oldest and longest-running scientific journal, and many famous papers have been published in it. Rather than looking again at the important discoveries that have been announced in its pages, we wanted to investigate the phenomenon of the scientific journal itself and how it has developed over time. Everyone who works in universities today has some familiarity with academic journals, but we rarely stop to consider why we use this particular form of communication, or why journals work the way they now do. My team and I have been looking at what we call the 'behind the scenes' story: how was the Philosophical Transactions actually run? How were editorial decisions made? How was it produced and disseminated? By focusing on one journal, and taking the story right up to the current day, we are able to defamiliarise

Could you begin by briefly introducing your recently completed research project, 'Publishing the Philosophical Transactions: the social, cultural and economic history of a learned journal, 1665-2015'?

the scientific journal. The current debates about the future of scholarly communication mean that this work is highly topical.

What is your academic background and interests, and how did they lead you to this project?

I am interested in the ways in which scientific knowledge has been communicated in the past. That means thinking about who communicates it, to whom, and in what ways. I originally worked on popular science publishing in late 18th and 19th century Britain, because I was interested in looking at how people who were not themselves researchers or scientists could learn anything about the natural world. I have sometimes written about museums and lectures, but I have always been interested in processes of authorship, editing and production of scientific publications.

Why was the Royal Society's Philosophical Transactions, rather than another journal, such a good choice for this project?

The Philosophical Transactions is the world's longest running scientific periodical. It has a longer history than any other scientific journal. This means that we can examine historical change on a much larger canvas than would be possible for other journals. Nature and Science, for instance, are both less than 150 years old. The other

important thing about the Transactions is that the Royal Society has maintained its archives since the 1660s, and there is a vast amount of surviving evidence about how its journals were run.

What have been the most significant outputs of this project, both in terms of datasets and publications?

We are currently putting the final touches to the major output of the project, which is our co-authored book, *The Secret History of a Scientific Journal*. We have also published a variety of academic journal papers, blog pieces, magazine articles and a policy paper.

The project's funding period came to an end in August 2017. Moving forward, how do you plan to build on the findings and partnerships it produced?

I am currently discussing how to continue our partnership with the Royal Society, to investigate ways to integrate our historical research into the Society's new digital interface for its publications and publication-related archival materials. I have also been working with colleagues in the EU COST action 'PEERE: new frontiers of peer review'. This interdisciplinary, international network of scholars is interested in exploring ways of improving peer review, and I believe that our historical research can usefully inform this.

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Unlocking the history of academic publishing

Publishing the Philosophical Transactions: The Economic, Social and Cultural History of a Learned Journal, 1665-2015 is a historical research project which is set to stimulate debate about the future of scholarly publishing

For centuries, scientific knowledge has been communicated, constructed and built upon through academic journals. Indeed, it is difficult to overstate the importance that publishing the findings of scientific enquiry has had upon the scientific community and the world beyond it. Professor Aileen Fyfe, a highly experienced social and cultural historian of science and technology, sees scientific journals as enabling researchers to 'communicate with each other, while also creating a version of record for later researchers (or historians) to consult'. This means it is possible to work through the historical role of journals to understand how science has been 'made' – how we got where we are today from where we were hundreds of years ago.

The Royal Society's Philosophical Transactions is the world's longest running scientific journal. It was established in 1665 and the way it has changed tells us much about the history of scholarly communication. By looking at its economic, social and cultural history we gain insight into how many of the things we now take for granted (for example, peer review, refereeing and the profitability of scientific journal publishing) came about.

It is with the fascinating opportunity that Philosophical Transactions provides in mind that the 'Publishing the Philosophical Transactions: the social, cultural and economic history of a learned journal, 1665-

2015' project was established. The four-year project began in 2013 and was completed in 2017.

THE ECOSYSTEM OF ACADEMIC PUBLISHING

The University of St Andrews is the lead research organisation and Fyfe is the Principal Investigator for this project which is unique in its ability to study a journal over an extremely long historical period, enabling the team to address big questions of change over time. 'In the 21st century, academic publishing not only underpins claims to new scholarly knowledge, but has become a highly profitable industry, and a major influence on the professional standing of researchers working in universities throughout the world,' explains Fyfe. 'It is crucial that we understand both how the ecosystem of academic publishing currently functions, and how it came to be that way. Certain practices that can appear to be set in stone have, in fact, evolved over time to fit particular social, economic or political contexts.'

As with historical practices, current practices are certain to change in the future. As the team uncover more about what changes have occurred over time, they are participating in discussion on what the new forms of rapid, global scholarly communication might look like. By understanding the history of Philosophical Transactions, researchers can reflect on

what is truly beneficial and necessary.

CLOSE COLLABORATION

Given that the Royal Society is the publisher of the journal under investigation, it is fitting that it has been an active and involved partner from the very beginning. Indeed, the idea for the project emerged from the Society's Library and Archives team who, being aware of the upcoming 350th anniversary, wanted to commemorate it in a particularly special way. Fyfe and her team have also developed close links with the Society's Publishing Division, which has previously made use of the history of Philosophical Transactions in marketing and brand management, but wanted to be certain that the evidence supported the claims they were making. The research has ensured that the Society makes well-grounded claims about its contribution to the development of peer review; and has uncovered its hitherto unacknowledged role in the non-commercial circulation of knowledge. 'The Publishing Division has been particularly interested in the team's research into the more recent history of the journal, from 1945 onward', observes Fyfe. This has helped them answer a variety of questions they had regarding the more recent history of the journal.

As with any successful collaboration, Fyfe and her team have also benefited. For instance, the Publishing Division provided the team with access to recent records,

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‘It is crucial that we understand both how the ecosystem of academic publishing currently functions, and how it came to be that way’

and the staff at the Society briefed the team about the commercial, editorial and reputational issues in modern publishing – something particularly helpful in shaping the historical questions the team were asking throughout the course of the project.

350 YEARS OF CHANGE

Naturally, given the 350-year history of the journal, documenting its transformations represented a significant challenge. Despite the fact the project lasted for four years, the sheer weight of material in the archives meant it was impossible to examine all of it in detail. ‘There are thousands of referees’ reports evaluating papers submitted for publication since the 1830s, and we have only been able to sample these,’ explains Fyfe. ‘Another challenge has been how to write up our findings: how to include enough detail and analysis to contribute to scholarly debates in each of the time periods we cover, while also being able to present the “big picture” that is so useful to contemporary commentators, and which is one of the unique selling points of our project.’ To overcome these challenges, the team has made a point of producing different types of writing – and talking – for different audiences.

The project uncovered a plethora of fascinating discoveries. One was that the notion of the ‘scientific journal’ is not a single, stable category and should not be viewed as such. For, despite the fact that *Philosophical Transactions* gives the appearance of being a single, continuous periodical, it has looked and functioned very differently over the years.



One of the team at work in the Royal Society’s library.

THE VALUE OF PEER REVIEWS

Another noteworthy conclusion concerned the practice of peer review, which is an essential part of scholarly publishing that many now take for granted. ‘Peer review is much newer than we all assumed. The term came into common use only in the late 1960s and 1970s. The coining of “peer review” marks the wider recognition of a practice of research evaluation that had previously been confined to the periodicals of voluntary, gentlemanly learned societies,’ explains Fyfe. ‘We have spent a lot of time investigating why a society like the Royal Society would think that requesting confidential, written reports on the merits of a submitted paper was the right form of evaluation.’ The team also discovered that the use of referees can be seen as a form of collective decision making that spreads reputational risk and protects the institutional finances.

A MISSION FOR SCHOLARSHIP

Perhaps most fascinating of all was the discovery that, until the 1950s, the majority of scientific journals did not operate on a commercial basis. ‘The Royal Society gave away hundreds of copies of its periodicals to universities, societies and government institutions throughout Britain, Europe, North America and the British Empire,’ explains Fyfe. ‘The costs were borne by the Society, for the sake of scholarship, rather than being recouped through sales. There are clear parallels to the Open Access movement’s desire to circulate knowledge at no cost to the end-user.’

Ultimately, the findings from the project should give academics a greater appreciation of the roots of the ethos of sharing – an ethos that still permeates the academic community. There is something wonderful about the extent of voluntary labour undertaken by all those who write, review and edit for scholarly journals without direct remuneration. Doing something that is of benefit to us all is something that existed 350 years ago – and, thankfully, continues to exist today.

Project Insights

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PRINCIPAL INVESTIGATOR BIO

Professor Aileen Fyfe gained her PhD in History & Philosophy of Science at the University of Cambridge, and then worked at the National University of Ireland, Galway, before moving to St Andrews, where she is currently Professor of Modern History. Her research interests are in the production, circulation and consumption of knowledge from the late seventeenth century to the present day. She is the author of the prize-winning book *Steam-Powered Knowledge* (2012), co-editor of *Science in the Marketplace* (2007), and lead author of the briefing paper ‘Untangling Academic Publishing: A history of the relationship between commercial interests, academic prestige and the circulation of research’ (2017).



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