

Case for Support

Publishing the *Philosophical Transactions*

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

Research Questions or Problems

The importance of scholarly journals to the advancement of knowledge is widely recognised, and underpins the on-going debates about the future of academic publishing. The policies and prices of journals are at the heart of questions about access to the results of scholarship, while their editorial and reviewing practices are fundamental to the perceived rigour and reliability of published research. This project approaches these crucial contemporary issues from a historical perspective by investigating the social, cultural and economic history of the oldest surviving scientific journal in the world: the *Philosophical Transactions*, founded in 1665. (It is also the second-oldest surviving scholarly journal, the *Journals des savants* having preceded it by a few months.)

The unique attraction of the history of the *Philosophical Transactions* is the opportunity for a long chronological study: the Royal Society of London holds archival material relating to the publication of the *Philosophical Transactions* for its entire history. No other scholarly journal – or periodical of any type – has an archival record for such a long period of time. Regardless of the subject matter of the contents of the *Philosophical Transactions*, a 350-year study of a single periodical offers an unrivalled opportunity to track developments in authorial, editorial, and print trade practices over the long term. For entirely practical reasons, studies of authorship, reading and publishing usually focus upon a rather shorter time frame, and may be thought of as snapshots. Following the fortunes of one periodical through three and a half centuries will offer us structuring narrative for the British book trade from the Restoration, through the development of modern publishing in the eighteenth and nineteenth centuries, to the era of electronic publishing. *Philosophical Transactions* will offer a fixed point to which other histories can be compared.

Moreover, the fact that *Philosophical Transactions* is at the heart of English-language scientific publishing means that its history is of interest for more than its contribution to book trade history. The published record of *Philosophical Transactions* has already been used by researchers tracing the development of scientific writing styles, citation practices, and collaboration patterns. The archival record will enable us to look behind the published page. In particular, it will enable us to examine editorial practices (including peer review), sales and marketing, and distribution patterns, which will enhance our understanding of the processes by which scientific knowledge is constructed and communicated. Again, the long time-frame of this study offers unrivalled opportunities for examining how these practices of scientific communication have changed over time. We have a tendency to locate the history of science communication within the history of science, and to associate its changes with the professionalization and specialisation of the scientific community. This project will be aware of that context, but will aim to locate the history of scientific communication within a broader history of authorship, reading and publishing over the last 350 years.

The project will aim to:

- Compile historical economic data series of interest to all scholars of the book trade: on the costs of paper; composition; press work; illustrations; and the journal's income and expenditure
- Compile historical data series regarding the circulation of scientific knowledge in *Philosophical Transactions*: its print run; its circulation/sales; its acceptance ratio for submitted papers (when applicable); and (if possible) a reconstruction of its historical impact factor
- Analyse the editorial practices of the journal, with particular attention to the personal role of the editor, the types of articles published, the move from reporting oral papers delivered to the Royal Society to open submission of written papers, and the emergence of peer-review
- Assess the fortunes of the *Philosophical Transactions* (and of Royal Society journal publishing more broadly) as a business enterprise over time, and thus evaluate the place of learned journal publishing within the commerce of the book trade
- Evaluate the effects of new technical developments upon the circulation of scientific knowledge, particularly processes for the reproduction of illustrations, and the development of steam-powered, and later, electronic publishing systems
- Assess (as far as possible) the reputation of *Philosophical Transactions*, as seen by its contributors, its readers, and outside commentators, over time. Consider why authors chose to submit there, rather than elsewhere; and how readers valued knowledge claims made in its pages, rather than elsewhere
- Reconstruct (as far as possible) the distribution and readership, over time, of the *Philosophical Transactions* in the global scientific community, through examination of subscription lists, booksellers' records, reciprocal journal exchange schemes, and citations
- Trace the changing relationship between science and its publics by examining how the findings of research published in *Philosophical Transactions* have subsequently been reported to a wider public by newspapers, radio, television and internet; and consider how the editorial staff of the journal have sought to mould the 'public life' of its research articles

Research Context

This project lies at the intersection of two main fields of research: the history of science, and the history of media and publishing.

The history of science communication is intrinsic to the history of scientific communities and the progress of research. Since the rise of constructivist accounts of natural knowledge in the 1970s, the importance of communication has received more attention, with historians and sociologists of science investigating the processes, both formal and informal, through which experimentally-based knowledge was disseminated, and thus transformed into publicly-acknowledged facts. The role of learned journals has been recognised alongside that of correspondence networks and learned societies, yet in contrast to the sophisticated historiographies of those two areas, the scholarship on journals has tended to produce bibliographical checklists, or descriptions of the foundation and early years of particular titles. A.J. Meadows's edited volume *The Development of Science Publishing in Europe* (1980) remains the standard overview, despite its limitations (including an extremely basic chapter on scientific journal publication prior to 1800). The books and articles of David Kronick, from

the mid-1960s to the 1990s, offer valuable checklists for seventeenth and eighteenth-century scientific journals. The obvious exception to the limitations of the existing literature on scientific journals is the large and rich literature on the language of science, with its focus on rhetoric, style and vocabulary, which has often used journal articles as its corpus. Gross, Harmon, and Reidy's *Communicating Science: the scientific article from the seventeenth century to the present* (2002) is a good example of this type of linguistic study.

The scholarship on scientific journals stands in contrast to the recent flourishing of scholarship dealing with the history of scientific books. Since the 1990s, Adrian Johns, James Secord, Aileen Fyfe, Jonathan Topham and others have drawn inspiration from the emergence of 'the history of the book' as a form of cultural history, as exemplified by Robert Darnton's work, and have produced detailed studies of the authorship, readership and publishing of particular scientific books. There is as yet no synthetic work on the history of scientific book publishing, although Frasca-Spada and Jardine's edited collection, *Books and the Sciences in History* (2000) is a useful starting point.

While much of the interest in scientific books has focused on the nineteenth and early twentieth centuries, the scholarship on scientific journals has focused more upon the seventeenth and early eighteenth centuries. To an extent, this reflects the differing interests of scholars: many of those who work on scientific books are interested in the popularisation of science, which became more significant during the nineteenth century, while those working on journals have considered them alongside the foundation of the learned societies which supported them. (The development of commercial science journals in the nineteenth century is an important exception.) But the earlier chronological focus of research on journals also reflects the tendency to deal with the foundation of journals, rather than their subsequent working lives. Thus, David Kronick and others have told the story of the early printing and publishing history of the *Philosophical Transactions*, but a significant contribution of this project will be the emphasis placed upon how the working practices of *Philosophical Transactions* have changed over the centuries. We want to investigate how the journal actually functioned, and how its role and policies changed as competitors emerged, and as the nature of the scientific profession changed.

It will already be clear that this project draws substantially upon histories of print and the media. The period of this project spans both the divides between hand-press and machine-printing, and between print and electronic publishing. With the exception of survey texts, such as John Feather's *A History of British Publishing* (2nd edn, 2006) or Briggs and Burke's *A Social History of the Media: from Gutenberg to the Internet* (3rd edn, 2010), few scholarly projects attempt to cover such a lengthy period. This is why this project could not easily be handled by a single scholar, as it will require expertise in the early modern as well as modern periods.

The history of periodicals has tended to fall between the better-established fields of journalism (especially newspaper) history and book history. This project will combine a recognition of the distinctive features of periodicals with a close attention to printed publications as material commodities.

Several of the themes of this project have already been addressed in small-scale by recent articles in *Notes & Records of the Royal Society*, for instance, on peer-review in mathematics; on collaboration; on the use of illustrations. These articles have demonstrated the clear potential in the Royal Society archive, and we aim to expand their scope substantially.

Research Methods

Scientific journals have been most often approached by historians in terms of their contents. The 'SciPer' Project (Science in the Nineteenth-Century Periodical), for instance, investigated the scientific material included in generalist periodicals, and the *Philosophical Transactions* has

frequently been used by researchers tracing the development of scientific writing styles, citation practices, and collaboration patterns. In contrast, this project will use the unique archival record of the Royal Society publishing division to look at the people and processes lying behind the published page.

Stretching back to the seventeenth century, the Royal Society's archives include minute books, account books, correspondence, and, relating specifically to *Philosophical Transactions*, manuscript copies of all papers read to the Society or submitted for publication, referees reports and correspondence relating to those papers, and the paperwork of the editorial committee ('Committee of Papers'). For instance, original correspondence edited to form the *Philosophical Transactions* is collected into the eighteenth-century archival series Letters and Papers (3,660 papers 1741-1806), and continued into the nineteenth-century manuscript series Philosophical Transactions (1,001 papers 1807-1865). By that time, unpublished papers were being preserved in Archived Papers (1,603 papers 1768-1851) and material abstracted in Proceedings (773 papers 1882-1894). Referees' Reports were preserved (6,094 reports 1832-1917) and earlier judgements are in the minute books of the Committee of Papers (8 volumes 1752-1927). These materials are not simply textual: original artwork from some the period's finest painters, including Sir Thomas Lawrence and Franz Andreas Bauer, is just beginning to be catalogued and made available to researchers.

The archive also holds financial and administrative records including full runs of period Account Books, Council Minutes and other material outlining the cost and changing print production methods. The more modern records are held by the Society's publishing wing. The Publisher, Mr Phil Hurst, is keen to enable the project to work right up to the present day, and is willing to give the team access to the very recent records, with the proviso of first sight of proposed publications. In certain periods, it will be possible to pursue research through the records of those who printed for the Royal Society. For instance, the archives of Taylor & Francis, who printed for the Royal Society for much of the nineteenth century are held at the St Bride's Printing Library, London. The published content of *Philosophical Transactions* from 1665 to 1945 is freely available on the Society's website.

In addition to editorial and publishing papers, there are references to the *Philosophical Transactions* in the personal papers of fellows and officers. These range from large sequences (astronomer Sir John Herschel's 10,600 letters with period diary) to smaller groups (including the physiologist Sir William Sharpey and physicist Joseph Larmor) and will help us to gauge the dissemination of, and reaction to, particular works of science and the journal as a whole. These personal papers will be supplemented by similar collections in other archives, most notably, the Hans Sloane papers in the British Library.

The first element of this project is straightforwardly descriptive: we will need to compile a comprehensive time-line for the *Philosophical Transactions*. We need lists of editors (and other editorial staff), printers and distributors; and we will need to identify the key organisational changes (e.g. the move into formal control by the Royal Society; changes of physical format and of price; changes in distribution model and in editorial policy; the launch of other Royal Society journals). Many but not all of these details have been established for the pre-1800 period, but it is astonishing that there is currently no comprehensive chronology for the *Philosophical Transactions*.

Part of this project is strongly economic, and will involve the construction and interpretation of long chronological series of data relating to production costs, print runs, price and sales figures. These figures will have to be compiled from a range of sources, since, although publishing costs are often recorded in the Royal Society's Account Books, there is no continuous sequence of publication ledgers. All project staff will be responsible for seeking out relevant data; but Dr Fyfe will have responsibility for its overall compilation and analysis. She will draw upon her prior experience in

working with nineteenth-century publishers' ledgers, and her knowledge of the economics of the book trade.

The rest of this project involves social and cultural history: the investigation of the editorial and marketing practices of the journal; of its circulation and distribution; and of its readership and impact in the scientific and wider communities. The first aspect will depend heavily upon the Royal Society archive and the second upon surviving printers' archives; but the third aspect will require us to cast a far wider net, perhaps using the archives of other learned societies or the papers of individual scholars, and certainly using the published runs of other learned journals and more general periodicals and newspapers. The long period under study in this project means that quite different skills and knowledge will be needed for investigating the early modern and late modern *Philosophical Transactions*, and this is why we seek to appoint two postdoctoral researchers with appropriate skill sets.

Project Management

Dr Aileen Fyfe (PI) will be in overall charge of the intellectual progress and management of the project, with Mr Keith Moore (co-investigator) acting as local liaison and mentor at the Royal Society. A significant challenge for this project will be staff management, and building a successful culture of team-based research. Although the project will be based at the University of St Andrews, the two postdoctoral researchers are expected to reside in London, to enable regular, sustained access to the archival records at the Royal Society and in other London depositories. They will have office space, facilities and staff privileges at the Royal Society. In contrast, the Principal Investigator (and two doctoral students working on closely related projects, funding permitting) will be based in St Andrews.

The plans for melding the geographically-disparate researchers into a team are:

- regular informal group meeting, where everyone can report what s/he has been up to, raise problems and report new discoveries. This meeting will usually be bi-located, with the two groups linked by video-conferencing or Skype
- monthly meetings in person: either the PI or the two postdocs will travel each month, with meetings alternating between London and St Andrews. As well as group progress reports, these monthly meetings will provide the opportunity for personal meetings with each researcher, which will include both appraisal and mentoring
- secure IT systems that will enable collaboration on the creation of the data series, and will include a group wiki (or similar workspace) which will enable everyone to keep track of what the others are doing, and act as a record and resource

The amount of travel and accommodation involved will be significant, but it will be less than if the postdoctoral researchers were making extended research trips from St Andrews; and it will be essential to the success of the team project.

The Royal Society is keen to promote both the *Philosophical Transactions* and the Society's support for the history of science during the anniversary year 2015, and there will be activities planned for academic (both history of science, and wider) and public audiences. These are currently expected to include:

- a one-day workshop on the *Philosophical Transactions* in 2013
- a special issue of *Notes & Records of the Royal Society* in 2015

- a major conference on *Philosophical Transactions* in 2015 (incorporating public engagement events focusing on the future of scholarly journals, peer review, and impact measures)
- an exhibition at the Royal Society in 2015

The project team will be responsible for organising these events, in collaboration with staff at the Royal Society, and under the supervision of Dr Felicity Henderson, the Society's Exhibitions and Events Manager. The PI and the postdoctoral assistants will contribute papers to the workshop, the resulting special issue, and the major conference.

The team will also be responsible for a co-authored history of the *Philosophical Transactions* (to be submitted, summer 2016), and for the creation of the electronic data sets (to go public, 2017).

Dissemination

The main academic outputs will be the book-length history, associated journal articles, the special issue of *Notes & Records of the Royal Society*, and the database containing electronic sets of book trade data and their related archival entries. The book-length history will be a scholarly work, of interest to scholars working in the history of science communication, and on the history of the print trades. *Notes & Records* has a dual audience, as it is read not just by professional historians of science, but also by fellows of the Royal Society; it therefore takes the results of historical research to a wider, though still academic, audience. The database will be made freely available on the University of St Andrews Arts Research website (and linked from the Royal Society's Centre for the History of Science research website), and will become a valuable reference tool for future research on the economics of the British book trade.

In addition to these academic outputs, there will be a number of more public events. The anniversary in 2015 will be celebrated with a public exhibition at the Royal Society, and with a major conference on the history of scientific publishing. This conference will be of relevance to historians of science communication, and of print culture, but will also incorporate a number of public engagement events, on such topical issues as peer review, open access and impact, which will enable the project staff to reflect publicly on the contemporary relevance of their historical research. This substantial programme of events will be a challenge to organise, but the project staff will benefit from the experience and skills of the Society's Exhibitions and Events team.