

**Royal Astronomical Society: Written submission to the House of Commons Science & Technology Committee**  
**[Inquiry on scientific publications](#)**

Clerk of the Science and Technology Committee  
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12 February 2004

Dear Sir/Madam

Attached is the Royal Astronomical Society's written submission to the House of Commons Science & Technology Committee Inquiry on scientific publications.

Yours sincerely,

David Elliott  
Executive Secretary

## Introduction

The Royal Astronomical Society (RAS) has the aim, as expressed in its charter, of "the encouragement and promotion of astronomy". Those aims have been extended to embrace geophysics, solar and solar-terrestrial physics, and planetary sciences (as well as the 'new astronomies', such as astro-particle physics, astrobiology, etc.), and are pursued through a range of activities, including:

- the publication of astronomical and geophysical research, in the RAS's journals;
- regular meetings, in London and elsewhere;
- the award of modest grants in support of research and study;
- educational activities at all levels; and
- the maintenance of a comprehensive reference library

The membership consists of Fellows and Associates. Fellowship brings many benefits, and is open to any person over the age of eighteen whose application is acceptable to the Society; the Fellowship consists of primarily professional astronomers and geophysicists, based in the UK and elsewhere, with a significant number of students, advanced amateur astronomers, and others with an interest in the geo- and astro-sciences.

The following evidence consists of two parts: first an explicit response to the questions asked by the Committee, and second a short essay summarising the Society's perspective on the current state of, and good practice in, scientific publishing.

## Part 1: Response to the Committee's questions

Q1. What impact do publishers' current policies on pricing and provision of scientific journals, particularly "big deal schemes", have on libraries and the teaching and research communities they serve?

R1. A key structural feature of the market for scientific journals is that libraries have limited budgets for journal subscriptions. Thus the range of journals purchased by libraries is sensitive to marginal changes in subscription costs and is usually reviewed each year. Some publishers have been exploiting this feature by offering "big deals" that offer a range of journals in a single bundle with guaranteed prices several years ahead, but lock libraries into purchases over those several years (thus excluding the publisher's journals from these annual reviews). For some libraries this can be cost-effective, but for others can lead to a situation in which they have to cut purchases of non-deal journals regarded as essential by their users. This problem is now recognised in the library and research communities and the ensuing debate is generating opposition to the continuation of such deals. We expect that this debate will continue and that, as a consequence, the take-up of big deal will be restricted to those institutions for whom it offers real benefits. Ultimately this is an issue for library management to choose between the flexibility to manage their purchases year-on-year and the financial benefits of the big deal.

Q2. What action should Government, academic institutions and publishers be taking to promote a competitive market in scientific publications?

R2. The market in scientific publications is a global market in which journal quality, not cost, is the key driver. Scientists want to publish in high-quality journals with world-wide distribution as that gives the greatest visibility for their results. To maintain and promote competition on quality it is important to raise awareness in the research community at both group and individual

level. The research community are the players who drive the quality of scientific publishing – as authors, reviewers, editors and readers – but often have only a hazy perception of their key role. Government and academic institutions should encourage activities that raise researchers' awareness of their role in scientific publishing, e.g. training on the nature of the publication process (including IPR issues) and encouraging researchers to participate as reviewers and editors. The scientific societies can make a major contribution to this process by engaging their members in the debate about scientific publishing and by intervening in the market to promote quality, e.g. through existing and new publications. Such actions are a natural part of the societies' role to promote their science.

It is also important to consider the role of financial issues as a basis for development of the market, e.g. the ability to invest in new journals (as new scientific subjects emerge), in electronic publishing and in value-added services that can be built on electronic publishing, e.g. access to cross-references, citation searches and data. Commercial publishers can play an important role here as they have good access to capital resources needed to develop these services. But to provide the long-term solutions needed to advance science they must work with the scientific community. A key issue for the latter is inter-operability or open standards – the ability to link electronic services provided by different organisations. Publishers should work together to promote such inter-operability - the CrossRef initiative [<http://www.crossref.org>] is a good example of what can be done.

Q3. What are the consequences of increasing numbers of open-access journals, for example for the operation of the Research Assessment Exercise and other selection processes? Should the Government support such a trend and, if so, how?

R3. The bodies that assess research output (e.g. through the RAE and Research Council grant reports) need to monitor the development of both open-access journals (and other journals) in order to be able to judge whether papers have been published in high quality journals. This judgement will need to be tailored to each area of science by the panel assessing that area. In parallel authors need to be aware that their choice of journals for publication will influence how assessment bodies judge those publications. This can be addressed as part of the training discussed in R2.

We believe that Government should not seek to promote particular models of journal operation, but rather it promote the concept underlying open access – namely that there should be widespread dissemination of scientific papers. This is a must for authors (especially young authors) as it ensures that their work is known to and considered by their peers. Thus the Government should encourage competition amongst current business models, including open-access, to see which can best achieve that dissemination. We believe that the present open-access model will have to evolve to allow a range of solutions while maintaining its underlying concept of maximum dissemination. These are likely to include solutions similar to the present RAS business model where the scientific society runs the editorial process while publishing is contracted out to a commercial partner thus giving access to the management skills and capital resources that this partner can provide. It is central to this solution that the society is the owner of the journal.

To encourage competition amongst the current business models, the Government could ask the holders of IPR on scientific publications to make a clear and public statement of the purpose for which they hold the IPR and the value that they derive from it. Authors asked to transfer IPR to these holders should be in a position to assess whether they find this acceptable.

Q4. How effectively are the Legal Deposit Libraries making available non-print scientific publications to the research community, and what steps should they be taking in this respect?

R4. In our experience, the use of these Libraries as a source of journal articles for the mainstream research community (universities, public and private sector research institutes) has declined significantly in recent years. They may still be an important source for researchers outside that mainstream.

Q5. What impact will trends in academic journal publishing have on the risks of scientific fraud and malpractice?

R5. The present trends will have no adverse impact if present methods to mitigate this risk are maintained and developed. The key safeguards against fraud and malpractice include: (a) rigorous peer review (which includes checks on the consistency and novelty of results), and (b) the tradition of spirited debate within the scientific community through which all scientists can expect their results to be challenged and require open and transparent justification. Electronic publishing has the potential to improve such checks by encouraging authors to make their data and detailed analyses available on-line through links from published papers. This greatly extends the ability of the community to carry out both formal and informal peer review and is a development that should be strongly encouraged.

## Part 2: A Society perspective on Scientific, Technical and Medical (STM) publishing: “good practice” at the Royal Astronomical Society

1. Publishing is a core activity for most, if not all, learned and professional Societies; it lies at the heart of their mission. These Societies developed as those working in the field concerned recognised their common interest. Meetings that began as relatively informal discussions led to the establishment of organisations as it became clear that what was being discussed was worth recording and publishing for the benefit of those unable to present in person. This process, which still occurs today, led naturally to the development of learned publications. Learned Societies' involvement in STM publishing arises because it is central to the organisational mission to advance the respective field of learning.

2. As practiced by Societies such as ours, the primary functions of STM publishing are to inform those active (or aspiring to be active) in the field of current results and developments, and to act as a repository of what has already been learned. For both purposes, it is important that STM journals are **widely distributed** and **easily accessible to interested readers**. It also follows that the exercise of some form of quality control over what is published is required; to that end, the system of peer review was established and has been widely adopted. Peer review does not, as is sometimes claimed, ensure that all that is published is “correct”; rather, it ensures that the literature **is of value to its users**, as a clear statement of current thinking, free of obvious error, insignificant ephemera or excessive duplication. Peer review also seeks to ensure that the originators of ideas are given due credit. Learned and professional Societies are well suited to supervising this process, being independent of government and commercial interests. From this perspective, the question around which recent debate revolves is, at its heart, how best to cover the costs involved in the processes of peer review, article preparation and distribution.

## The Society model of STM publishing

3. Traditionally, institutional libraries act as proxy users, and their organisational subscriptions are in effect pooled by Society publishers to provide a steady base of revenues to cover the bulk of costs. The objective of ensuring that journals are widely distributed and their content easily available to interested parties has been addressed primarily by setting subscription prices at a point intended to maximise circulation without exposing the Society to excessive risk. Additional copies are made available to members of the Society (and often, members of related Societies) at low prices (often, near or even below marginal cost), and to the libraries of key institutions that cannot otherwise afford them at suitably reduced prices (not infrequently, gratis). To further extend the reach of individual articles, offprints are printed and distributed through the Society or its agents at prices commensurate with the cost of providing that service, and provided to authors, to allow them to respond to the requests of colleagues. Contributions to costs are also raised, to an extent that varies considerably between countries and disciplines, from authors (especially where special services such as the reproduction of colour figures are requested), from interested third party sponsors such as government or industry, and where considered necessary or desirable by the membership, from Society reserves. This long-standing model has proved unexpectedly robust in the face of the upheavals arising from electronic distribution. The main modifications have been associated with the development of searching and indexing systems associated with delivery of content, and that the distribution of offprints has been replaced by informal dissemination via the Internet.

4. We cannot over-emphasize the role of Societies' memberships in maintaining their journals' focus on the key issues of **wide distribution, accessibility and user value**. The memberships are composed of both authors and readers, and, in many cases, other members of the relevant STM community who, whilst they do not use the journals routinely, appreciate the value of this activity. Where journals are fully controlled by Societies, those responsible for its publishing activities are under constant pressure to develop circulation and minimise prices. Within the RAS, the Council itself takes the final decisions on journal pricing. Discussion of these issues is invariably lively and well-informed, because the scientists of which that body is composed include not only authors and readers, editors and reviewers, but those involved in the administration of their employing organisations with responsibility for setting or disbursing the library or research budgets that finance journal charges. Some members act in all these roles, so have a very clear perspective on the publishing process. **This strong and very valuable feedback mechanism is unique the Society publishing model** and provides its special strength. It is no accident that most of the top-ranking, widely-circulated STM journals are owned by Societies, or that the aggregate value of such journals to the community, even when expressed in the simplest cost-per-page terms, is substantially higher than those of journals controlled by commercial publishers.

5. The so-called "crisis in journals publishing" is widely described as the long-term consequence of the establishment of many niche journals from the 1960s onwards. In many cases, commercial publishers responded to the requirements of emerging disciplines more quickly than did existing Societies. Library budgets expanded rapidly so that institutions could acquire access to the full range of research results on offer. Such expansion could not continue indefinitely, and during the 1990s, the rate of growth of library budgets began to be restricted. Librarians cancelled subscriptions to those journals they considered less valuable, and some smaller publishers (both commercial and non-profit) found themselves in financial difficulties. Commercial publishers assembled large portfolios of titles through takeovers, most notably beneath the Reed-Elsevier imprimatur, and this, plus the low marginal costs associated with electronic publishing, has enabled them to offer the "Big Deal" – access to a wide range of additional titles at low cost in return for a long-term commitment to maintain existing subscriptions. Librarians find themselves forced to choose between maintaining and extending their range of subscriptions through the Big Deal, and giving up subscriptions to important serials elsewhere in their collections. This is placing at risk some journals that are not part of the Big Deal or similar packages. We do not demur from this analysis. However, we are conscious that the Big Deal is not the mere exercise of monopoly power – we accept that some librarians find that the value achieved for their institutions by adding a wide range of new titles at small cost more than outweighs the value lost by giving up some non-Big-Deal journals. Rather, it is the consequence of complex structural issues within the STM marketplace.

6. The Big Deal and similar offers have been enabled by development of electronic distribution systems via the Internet, which reduce the marginal cost of servicing an additional subscription almost to nil. However, this capability is not uniquely available to commercial publishers, and it is being exploited by forward-looking Society publishers. Many Society publishers have made electronic access to their journals available to members at low cost; in the case of the RAS, free of charge. This is a more substantial benefit than might at first appear. Electronic access is generally offered to institutional subscribers on the basis of internet address; to access the journal, the address of the computer used must be within the range owned by the subscribing institution. Individual password-based access makes the journal available to the Society member from any computer, for example, from her home computer or whilst visiting an institution which is not subscribed.

## RAS publishing

7. The Royal Astronomical Society (RAS) owns and controls three journals, *The Monthly Notices of the Royal Astronomical Society* (MN), *Geophysical Journal International* (GJI), and *Astronomy & Geophysics* (A&G). GJI is co-owned by the German Geophysical Society. MN and GJI are leading primary research journals in astronomy and geophysics respectively. A&G is a "news and reviews" journal aimed at professional workers in those fields; it is distributed to all members without additional charge, and is listed in the Science Citation Index. Peer review and acceptance of articles for publication in all three is managed entirely by members and staff of the Society. Production, delivery, marketing, subscription maintenance &c are contracted out, presently and through much of the journals' recent history, to the Blackwell organisation. Academic standards are of the highest levels. Throughout, authors receive considerable assistance to help them present the results of their research effectively, and the standard of production of both paper and electronic materials is extremely high. Although the number of primary journals is small, their volume (12,500 pages per annum for MN and 4000 for GJI) and status are such that this constitutes a science publishing operation of moderate economic size and high scientific impact.

8. Publishing policy is set by the RAS Council, which has consistently taken pricing decisions in respect of the two primary research journals consistent with the principle of maximising circulation without exposing the Society to significant risk. In cash terms, this has led to an average price for each published page of about £0.20, which is comparable with that of most non-profit publishers of similar material. Almost all institutions engaged in astronomy or solid Earth geophysics, worldwide, subscribe to the relevant RAS journal. Charges are levied on authors only when they wish to publish colour figures in the

printed journals; these charges are set to recover the additional costs incurred. All journals are made available to all members online as part of their membership package. The primary journals are offered to members of the RAS and related Societies at a price that recovers the cost of printing and forwarding the additional copies. Copies are offered to student and younger members at a further discounted price; that is, at a price below the cost incurred. The publishing activity normally generates a surplus, which is used to support the other activities of the Society, including the organisation of scientific conferences and meetings, a scientific library, and activities relating to the public understanding of science, such as the publication of guides to UK activity in astronomy and geophysics.

9. As a publishing organisation of moderate scale, the RAS gains many benefits from contracting the non-specialist aspects of this activity to a larger operator, including access to economies of scale and specialist expertise in areas such as production, subscription handling, finance and marketing. The RAS has worked with the Blackwell organisation for many years, but the contractual arrangements are subject to regular review, and alternative partners considered. In the past, the relevant contract for A&G has been placed with another provider.

10. The RAS normally asks authors to transfer copyright in their papers, but an alternative form (similar to that recommended by ALPSP) giving the Society permission to publish the material is available to accommodate those authors whose employers are unable or unwilling to transfer copyright. This intellectual property is viewed by the RAS as a gift held in trust on behalf of the author and her institution, to be used for the advancement of science, and to be made available as widely as possible, consistent with recovering the costs of publication. In addition to paper publication, electronic versions of papers are published through the Blackwell Synergy online document delivery system and similar systems operated by subscription agents. These systems provide sophisticated facilities for searching, viewing and managing papers, speeding the process of research. Non-subscribers can gain immediate access to articles and supporting facilities on payment of a per-article fee. Authors are provided with electronic images (.pdfs) of their published papers so that they can distribute copies to interested parties; they generally make these available through their organisations' own web sites. At an interval following original publication (presently three years), .pdfs of all MN papers are provided to the NASA Astrophysics Data Service which serves them to all at no cost. The primary reason that similar action has not been taken in respect of GJI is that no similar, globally recognised, archive repository for the geoscience community has yet been established. MN and GJI papers continue to be available via Synergy indefinitely and users continue to benefit from the additional features available through that service.

11. The effect of the above approach is that articles lodged with the RAS for publication in its journals are readily available to almost all members of the relevant research community via Synergy and similar systems. Other interested parties who are unwilling or unable to pay the per-article fee to access recently-published articles through Synergy meet only a low practical barrier to obtaining electronic copies of these papers. Titles, authors' identities and contact details, and abstracts are freely available from Synergy and many other sources. This information can be used to obtain copies of the .pdf images either from the authors' web pages or on application to the authors by email.

## The Society and Open Access publishing models

12. The "Open Access" approach to STM publishing has developed as a response to the soaring cost of journals and the perception that commercial publishers are deriving excessive profits from these activities. High prices, a restrictive approach to alternative distribution of material, and the effect of the Big Deal on lower-circulation journals which are nevertheless of great value to their readers, have led some to seek an entirely new way of doing things. However, this feeling is not universal. The traditional publishing system continues to function satisfactorily in many well-established disciplines, including those serviced by the RAS journals. In these fields, the core journals are, for the most part, owned and controlled by Societies who operate on the principle of seeking to maximize access rather than profit. We recognize, however, that there are fields, not least biomedical science, in which the cost of access to the literature forms a real barrier to participation in, and deriving benefit from, research.

13. The principal objective of the "Open Access" approach is no different to that of Society publishing – to make the results of research readily available to those who will derive benefit from them. However, advocates of the Bethesda model of "Open Access" insist that this is achieved through a very specific route; that is, the abandonment by authors and copyright owners of practically all copyrights other than the moral right to be identified as author; copies of materials are to be deposited with an archive meeting specific conditions immediately in publication. The Bethesda Statement was drawn up and agreed by representatives of the biomedical sciences and publishing organisations active in that field. That said, we note that not all publishing organisations claiming adherence to the "Open Access" model follow the stringent requirements of the Bethesda Statement. Whilst the RAS is in agreement with the overall goal of the open access movement, and regards itself as an "open access" publisher in the general sense of seeking to ensure that access to the research literature is open to all interested parties, both authors and readers, we consider that the immediate adoption of the Bethesda model by all publishers would be damaging to the areas of science that we serve.

14. The present Society-sponsored arrangements for publishing in astronomy and geophysics meet the needs of both the active research and wider communities:

· The peer-reviewed results of current and recent research published in the core journals of these fields are available to all interested parties at realistic cost, or, with little or no effort, at no cost beyond that of delivery

Furthermore:

- The peer-reviewed literature is readily available to most active researchers through powerful systems that offer searching and document management facilities tailored to specialist research needs.
- The authoritative source of any peer-reviewed article is clear and traceable;
- Authors have a substantial choice of journals with which to place the results of their research;

- Authors need not pay to have their work published;
- Published papers are archived on a variety of media in libraries throughout the world;
- Authors are protected from misquotation, misattribution or the distribution of otherwise inaccurate representations of their statements;
- Society publishers take steps to ensure that their journals and the results they contain are well and positively marketed to the relevant audiences.

15. Finally, it is worth noting that the cost to funding agencies of publication through the present Society publishing model is similar to that of publishing through the Bethesda model; "Open Access" journal charges levied on authors are typically in the range \$500 to \$1500, most commonly a flat fee of US\$1000. This is indistinguishable from the cost of publishing a typical paper in one of the RAS journals.

## **Bibliography**

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**Bethesda Statement on Open Access Publishing**  
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