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(Mis)Leading Open Access Myths

In the evidence presented to the House of Commons Science and Technology Committee Inquiry into Scientific Publications, many dubious arguments have been used by traditional publishers to attack the new Open Access publishing model.

Below, BioMed Central responds to some of the most prevalent and most misleading anti-Open Access arguments.

Myth 1. The cost of providing Open Access will reduce the availability of funding for research

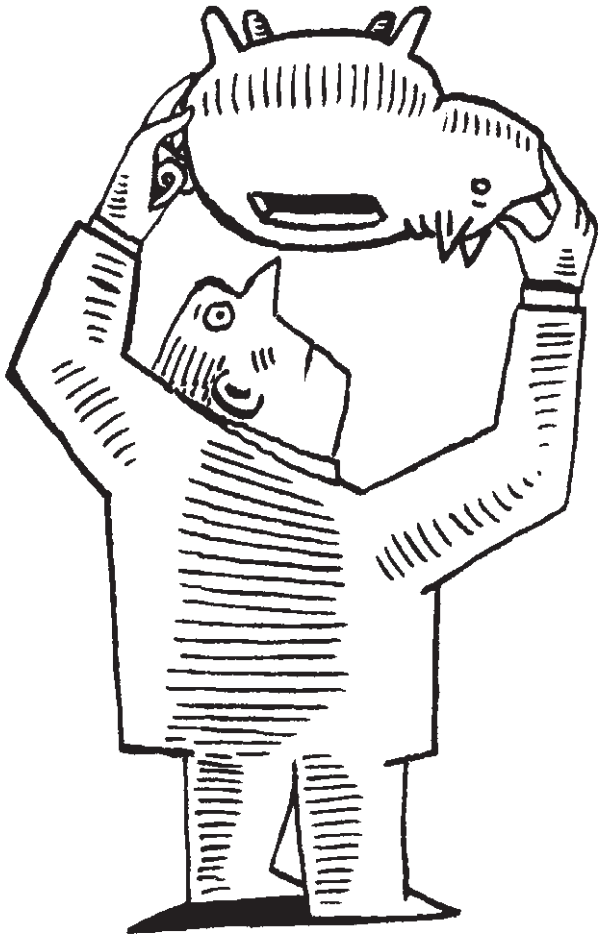
"There is also the question of the impact on the funding of research by charities, particularly those without the considerable resources of the Wellcome Trust. The Royal Society, for example, runs number of funding schemes for scientists. Perhaps the best known is the University Research Fellowships, most of which are funded by our Parliamentary Grant in Aid (PGA). Our 300 University Research Fellows publish an average of about four papers per year. Based on an estimate of USD 3,000 fee per article (which we believe is realistic if the current high standards in publishing are to be maintained) an extra USD3.6M or £1.96M per year would need to be found to fund our URFs alone. In the absence of an increase to our PGA we would be forced with the choice of reducing amount of research money funding allocated to our URFs, reducing in the total number of URFs that we could support or diverting funds from our other activities to compensate."

Written submission to inquiry, February 2004, Royal Society

Response

It is clear that at an overall macro-economic level, a switch to Open Access publishing would not negatively impact research funding.

The cost of the present system of biomedical research publishing, with all its inefficiencies and overly generous profit margins, still only amounts to about 1-2% of the overall funding for biomedical research (estimate from the Wellcome Trust, cited by Public Library of Science in their submission to the House of Commons inquiry). There is no reason why the cost of Open Access publishing should exceed the cost of the current system, since the fundamental process is the same. In fact, Open Access publishers are leading the way in using web technology to reduce costs further, so the cost of Open Access publishing to the scientific community will be significantly less than the cost of the system that it replaces.



Meanwhile, the vastly increased access to research that is delivered by Open Access will greatly increase the effectiveness of the research money that is spent, since all research builds on what has gone before it, and is needlessly handicapped if access to previous research is inconvenient, slow, or impossible. In short, funders will get more "bang for their buck".

At the micro-economic level, there will certainly be transitions that need to be carefully managed as the Open Access publishing model grows in economic significance. e.g. since the total cost of publishing scientific articles is roughly proportional to the amount of research to be published, it may well make sense for the costs of publishing to be incorporated into research funding grants, rather than being covered by library budgets. These are important issues, which deserve attention. But these transitional challenges should not be allowed to obscure the overall picture which is that with the Open Access publishing model the scientific community will pay significantly less, yet receive vastly more (in terms of access and usability).

Myth 2. Access is not a problem – virtually all UK researchers have the access they need

"All of us are committed to increasing accessibility of scientific content. I would argue that in the last ten years we have made a huge contribution to that, and I think 90 per cent worldwide of scientists and 97 per cent in the UK are exceptionally good numbers"

Oral evidence to Inquiry, March 1st 2004, Crispin Davis (CEO, Reed Elsevier)

Response

Elsevier's figure of 97% of researchers in the UK having access to Elsevier content is misleading. As explained in the small print of their written submission, this refers to researchers at UK Higher Education institutions only, many of which have indeed taken out ScienceDirect subscriptions as a part of JISC's "big deal" agreement.

However, these researchers do not have access to all ScienceDirect content by any means – the subset of journals that is accessible varies widely from institution to institution, meaning that access barriers are frequently a problem, even for researchers.

The access situation at institutions which focus primarily on teaching rather than research is particularly bad, but Elsevier disguises this by weighting each institution according to the number of 'researchers' employed, to come up with the 97% figure.

More fundamentally, the Higher Education sector is only one of several sectors carrying out biomedical research in the UK. Much medical research in the UK goes on within the NHS. Lack of online access to subscription-only research content within the NHS is a major problem, as detailed in a separate report. Similarly, Elsevier's figures conveniently omit researchers employed at institutes funded by charities such as the Wellcome Trust and Cancer Research UK, and in industry.

Myth 3. The public can get any article they want from the public library via interlibrary loan

"I think the mechanisms are in place for anybody in this room to go into their public library, and for nothing, through inter-library loan, get access to any article they want"

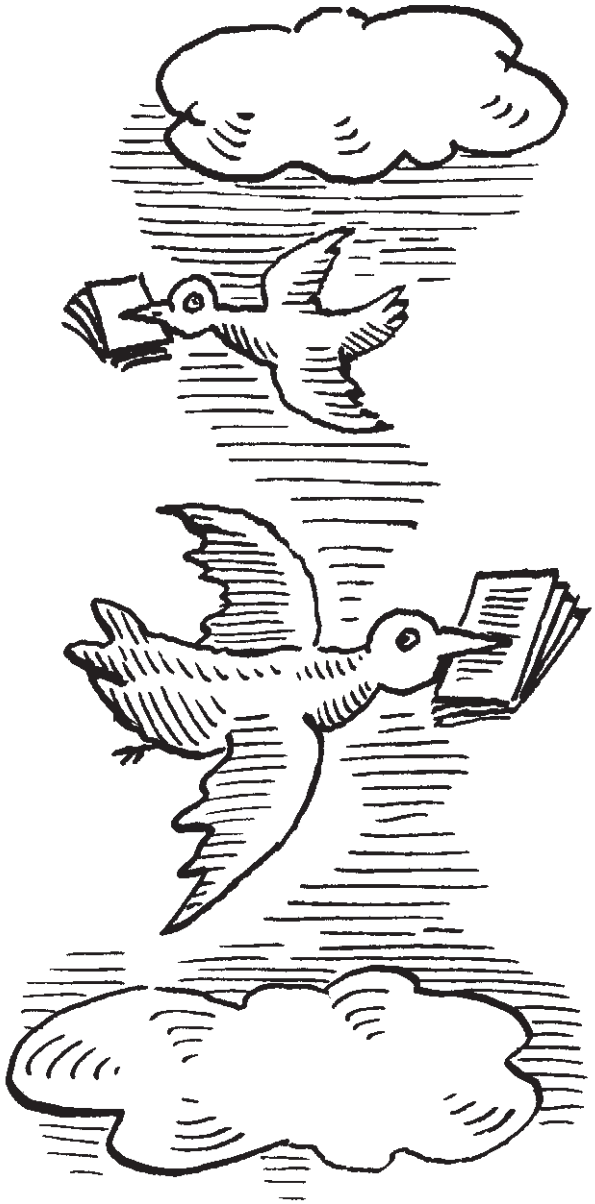
Oral evidence to inquiry, March 1st 2004, John Jarvis, (Managing Director, Wiley Europe)

"Incidentally, any member of the public can access any of our content by going into a public library and asking for it. There will be a time gap but they can do that"

Oral evidence to Inquiry, March 1st 2004, Crispin Davis (CEO, Reed Elsevier)

Response

To say that being able to go to the library and request an interlibrary loan is a substitute for having Open Access to research articles online is rather like saying that carrier pigeon is a substitute for the Internet. Yes – both can convey information, but attempting to watch a live video stream with data delivered by carrier pigeon would be a frustrating business.



Practically, the obstacles to obtaining an article via the interlibrary loan route are so huge that all but the most determined members of the public are put off. For those who persist, after a time lag that will typically be several weeks, their article may (if they are lucky) finally arrive in the form of a photocopy. What the user can do with that photocopy is extremely restricted compared to what they can do with an Open Access article.

- With an online Open Access online article, you can cut and paste information from the article into an email. With a photocopy you cannot.
- With an Open Access online article, the license agreement explicitly allows you to print out as many copies as you like and distribute them as you see fit. But if you copy and distribute the article you received by Interlibrary Loan without seeking appropriate permission from the publisher, you may well be in violation of copyright law.

It is also worth noting that an increasing fraction of public libraries now offer free or low-cost Internet access, making it even more convenient for the public to view Open Access research.

Myth 4. Patients would be confused if they were to have free access to the peer-reviewed medical literature on the web

"Without being pejorative or elitist, I think that is an issue that we should think about very, very carefully, because there are very few members of the public, and very few people in this room, who would want to read some of this scientific information, and in fact draw wrong conclusions from it [...] Speak to people in the medical profession, and they will say the last thing they want are people who may have illnesses reading this information, marching into surgeries and asking things. We need to be careful with this very, very high-level information."

Oral evidence to inquiry, March 1st 2004, John Jarvis (Managing Director, Wiley Europe)

Response

This position is extremely elitist. It also defies logic. There is already a vast amount of material on medical topics available on the Internet, much of which is junk. Can it really be beneficial for society as a whole that patients should have access to all the dubious medical information on the web, but should be *denied* access to the scientifically sound, peer-reviewed research articles?

In some cases, to be sure, comprehending a medical research study can be a demanding task, requiring additional background reading. But patients suffering from diseases are understandably motivated to put in the effort to learn more about their conditions, as the success of patient advocacy groups in the USA has shown. Patients absolutely should have the right to see the results of the medical research that their taxes have paid for.

Myth 5. It is not fair that industry will benefit from Open Access

"[*T*]*he major industry readers of information, like the pharmaceutical industry, would be in a much better position [with the Open Access model] since they do not produce very much in terms of new research articles. Of course, they purchase a lot for their industry. So companies that do not produce very much material but read a lot - I will not mention [companies], but this would be wonderful news for them. It would be wonderful news for the chemical industry and for the pharmaceutical industry, and bad news for major research institutes like Oxford and Cambridge, Harvard and Yale, and for countries like Britain*"

Oral evidence to inquiry, March 1st 2004, John Jarvis (Managing Director, Wiley Europe)

Response

It is peculiar to hear large commercial publishers saying that Open Access would be a very good thing for the pharmaceutical and other industries, and then claiming that this is a problem with the Open Access model. The chemical, biotech and pharmaceutical industries play a major role in the UK economy, and so this argues strongly *for* Open Access.

To say that they do not contribute significantly in terms of publishing research is inaccurate. Industry publishes a significant amount of research itself, and also funds much research within the academic community that then goes on to be published.

It is certainly possible that under an Open Access model, institutions (and countries) that publish a lot of research would pay a somewhat higher *proportion* of the cost of publishing than they do currently. Since it is the process of publishing the research that incurs the lion's share of the costs (with Internet distribution being very cheap in comparison), this is the most logical, sustainable way to fund the publication process. In contrast, the current situation, in which small universities effectively subsidize the cost of publishing the research carried out at relatively wealthy research centres, is far more inequitable and unsustainable.

But in any case, the *absolute* amount of money expended by the research institutions will fall, due to the far greater efficiency of Open Access publishing. Furthermore, research institutions that support Open Access will benefit greatly in terms of kudos and influence, due to the greater accessibility and visibility of their research. These institutions would therefore be cutting off their nose to spite their face to oppose Open Access on the grounds given above.

Myth 6. Open Access threatens scientific integrity due to a conflict of interest resulting from charging authors

"The second question that increasingly is being asked is the inherent or potential conflict of interest if a publisher is receiving money from the author to publish that article. There is an inherent conflict there in terms of quality, objectivity, refereeing and so on. One of the real strengths of today's model is that there is no conflict there. We reject well over 50 per cent of all articles submitted. Other journals do that or even higher. If you are receiving potential payment for every article submitted there is an inherent conflict of interest that could threaten the quality of the peer review system and so on"

Oral evidence to Inquiry, March 1st 2004, Crispin Davis (CEO, Reed Elsevier)

Response

This canard has been thoroughly debunked elsewhere. The assertion being made is, essentially, that Open Access publishers have an incentive to publish dubious material, in order to increase their revenue from Article Processing Charges. This is a very peculiar accusation for a traditional publisher to make given that in the same evidence session, Elsevier's hefty annual subscription price increases was justified as follows:

"On pricing, we have put our prices up over the last five years by between 6.2 per cent and 7.5 per cent a year, so between six and seven and a half per cent has been the average price increase. During that period the number of new research articles we have published each year has increased by an average of three to five per cent a year. [...] Against those kinds of increases we think that the price rises of six to seven and a half per cent are justified."

Oral evidence to Inquiry, March 1st 2004, Crispin Davis (CEO, Reed Elsevier)

i.e. Elsevier's primary justification for increasing their subscription charges (and profits) is that each year they are publishing more articles. In which case, if their own argument is to be believed, they face the exactly the same conflict of interest as Open Access publishers.

Fortunately, however, no such conflict of interest exists, for either Open Access or traditional publishers. Any scientific journal's success depends on authors choosing to submit their research to it for publication. Authors publish research in order for the value of their findings to be recognized. The kudos granted by a solid publication record is crucial for scientific career progression. Authors submit their research to journals with a reputation for publishing good science. If a journal had a reputation for publishing poor science, it would not receive submissions. Thus the system is inherently self-correcting.

It should also be noted that many leading journals (both commercial and not-for-profit) already have page charges and colour figure charges for authors, in order to defray expenses and to keep subscription costs down. Just two examples (of many hundreds) are the *Proceedings of the National Academy of Sciences* (*USA*), and *Genes & Development*. So author charges are hardly an unprecedented experiment.

It is true that commercial publishers have tended in some cases to remove author charges, and to commensurately increase subscription fees, since this suits their commercial interests in maximizing profits. But it is clear that author charges pose no fundamental problem to effective peer review.

Myth 7. Poor countries already have free access to the biomedical literature

"*"…what has happened is that the publishing industry has effectively, with the support of the societies it publishes for, given free access to poorer countries. There are various schemes, which you will see in the submissions - HINARI, AGORA for example, which deliver journals without charge to poorer countries; and that scheme is being enhanced and is lifting up to another level of slightly better-off countries*"

Oral evidence to Inquiry, March 1st 2004, Bob Campbell (President, Blackwell Publishing)

Response

HINARI, and its sister initiative, AGORA, are commendable initiatives and are undoubtedly warmly welcomed by researchers working in the eligible countries.

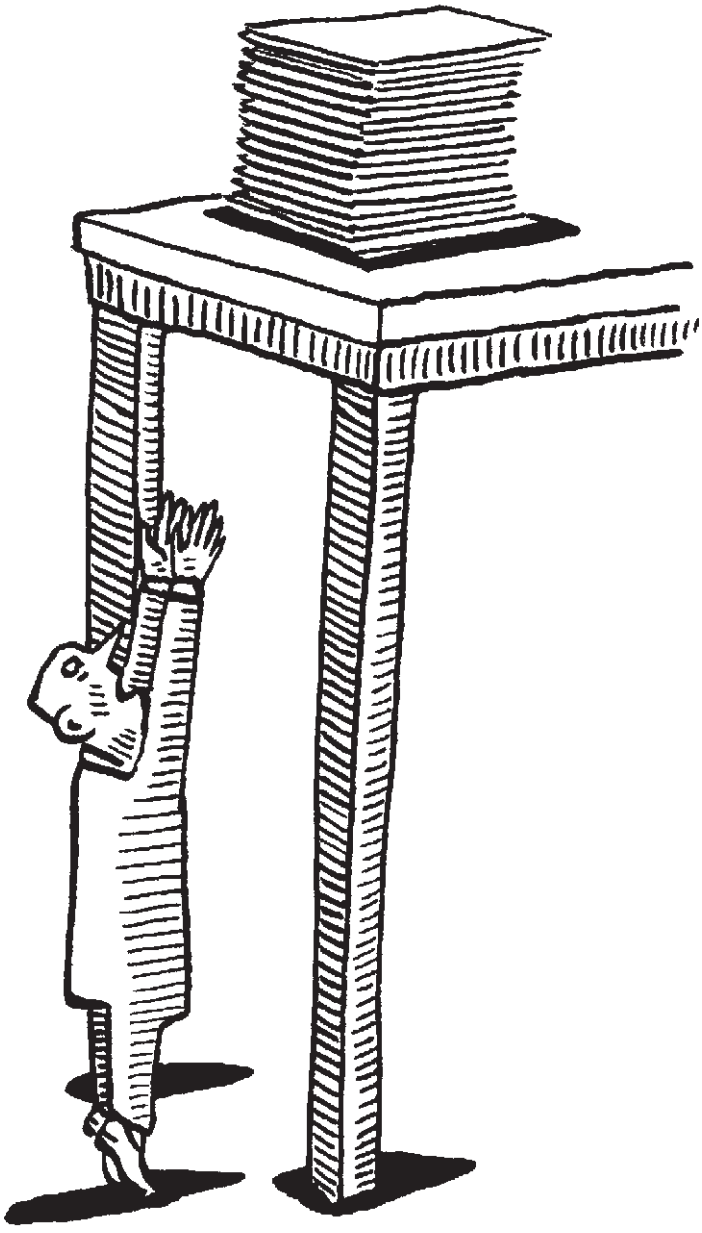
Via these schemes, publishers give some of the poorest countries free access to some of their journals. In HINARI, twenty-eight publishers participate, making a total of more than 2000 journals available for free to some of the poorest countries (defined as having a per capita annual income of less than $1000); and at a deep discount for some slightly less disadvantaged countries (per capita annual income between $1000 and $3000).

Unfortunately these schemes offer only a partial solution to the access problems of the developing world. The list of eligible countries has many notable omissions. It excludes large low-income countries such as India, Pakistan and Indonesia, even though these countries have per capita annual incomes of $735 or less, and are therefore "low-income" countries according to World Bank criteria. Countries such as Brazil and China (which are "lower-middle income" according to the World Bank) are also excluded from the eligibility list, even for discounts.

There is an obvious explanation for these omissions. These larger countries have significant research programs, so publishers can generate substantial income by selling subscriptions to them. It appears that traditional publishers will only offer Open Access to the developing world when they can be sure it won't affect their profits.

It is therefore clear that researchers in developing countries have a huge amount to gain from greatly expanded access to the global scientific literature that Open Access publishing will offer.

Certainly, there are challenges that need to be faced to ensure that authors in developing countries can publish in Open Access journals, but these challenges are by no means insurmountable. Indeed, many low-income countries have already started their own Open Access journals. Meanwhile, BioMed Central currently offers a full waiver of the article processing charge to authors in low and low-middle income countries. Long term, the scientific community will certainly find ways to ensure that scientists in developing countries get the full benefit of Open Access, both as readers and as authors.



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Myth 8. Traditionally published content is more accessible than Open Access content as it is available in printed form

"We make [our articles] available both in print and on line. In fact, open access would today have the result of reducing accessibility to scientific research because it is only available on the Internet. In this country that would exclude some 20-25 per cent of scientists; globally it would exclude over 50 per cent of scientists. In actual fact, the business model we have today gives the widest possible access."

Oral evidence to Inquiry, March 1st 2004, Crispin Davis (CEO, Reed Elsevier)

"Print is used by many scientists around the world and by global citizens who are the beneficiaries of scientific and medical research. To rely on the Internet alone for distribution, as most Open Access journals do, risks reducing levels of access among these beneficiaries. 11% of the world's population uses the Internet and only 64% of UK citizens have ever been online"

Written submission to Inquiry, February 2004, Elsevier

Response

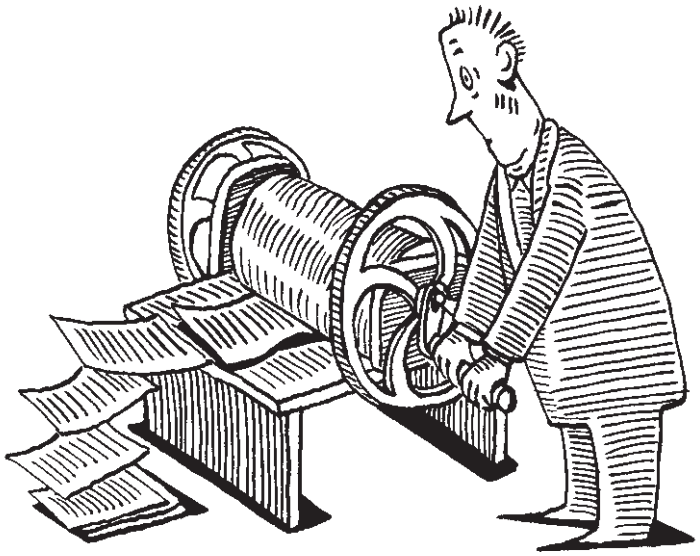
This claim should perhaps win a prize for audacity. To be clear: it is not just slightly wrong; it is preposterously wrong.

Firstly, sending out printed copies of journals to subscribers who pay for them is in no way in conflict with the goals of Open Access. Many Open Access journals (such as *PLoS Biology*, *Journal of Biology* and *Genome Biology*) have print editions. Wherever there is a demand for print (from libraries or from individuals) then print editions are available to those who wish to pay to receive them, just as with a traditional journal.

But, far more importantly, by Elsevier's own estimate some 30 million people in the UK (and more than half a billion people worldwide) use the Internet. The wonderful thing about Open Access is that any one of those hundreds of millions of people can print out copies of any Open Access article, and distribute them to whomever they want. If you want to get hold of an Open Access article, there are literally hundreds of millions potential sources.

We already see the power of this mechanism in action. In the poorest countries in Africa, those scientists who are lucky enough to have access to the Internet are downloading Open Access articles from BioMed Central's journals (e.g. *Malaria Journal*), printing them out in large numbers, and distributing them to their colleagues in areas the Internet does not yet reach. They confirm to us that this makes the research vastly more accessible than research published in traditional print-only journals.

In contrast, many traditional journals are received in print by only a few hundred libraries worldwide. Not only that, the libraries that hold these print copies are bound by strict rules governing what is and is not permissible in terms of copying and redistribution. To argue that these few hundred printed copies provide greater access to research than making articles openly accessible online is, frankly, ludicrous.



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Myth 9. A high quality journal such as Nature would need to charge authors £10,000-£30,000 in order to move to an Open Access model

"Under an author pays model, we estimate the actual cost per paper published would be in the region of £10-£30,000 depending on the impact of lost advertising"

Letter to Inquiry, January 13th 2004, Richard Charkin (CEO, Macmillan)

"There are many answers because there are many journals for many disciplines, and the impact will be different depending upon which discipline or which journal you are talking about. In our letter to you, speaking on behalf of Nature Publishing Group, in the case of Nature itself, the British international journal, in order to replace our revenues you would have to charge the author somewhere between £10,000 and £30,000 because the costs of editorial design and support are so high. The reason for the big disparity is how much advertising"

Oral evidence to Inquiry, March 1st 2004, Richard Charkin (CEO, Macmillan)

Response

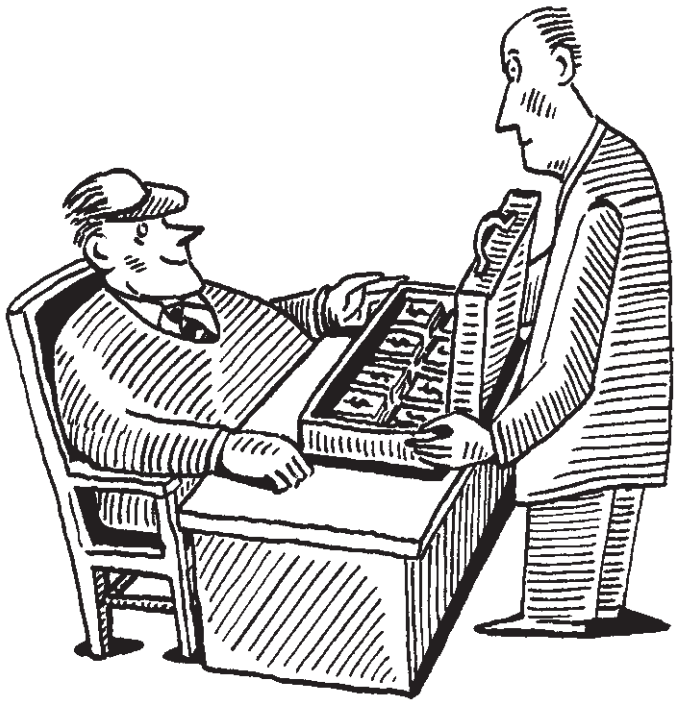
Although subsequent media reports failed to mention it, the quotes above make clear that this figure is only claimed to apply to *Nature* – an extremely special case among the tens of thousands of life science journals. Elsevier's evidence confirmed that, even with the inefficiencies of publishers' current systems, the cost per article for a typical journal is far lower:

"The cost to publish an article [...] ranges from between $3,000 to $10,000 per article [...] I would agree with those numbers."

Oral evidence to Inquiry, March 1st 2004,
Crispin Davis (CEO, Reed Elsevier)

"For Blackwell? [...] it worked out at £1,250 per article. That was the cost of the total system."

Oral evidence to Inquiry, March 1st 2004,
Robert Campbell (President, Blackwell Publishing)



But even for *Nature*, the figure of £10,000-£30,000 is wildly off the mark. The calculation used by Macmillan was as follows:

"Very crudely, £30 million of sales: we get income of £30 million and we publish 1,000 papers a year. That is your [£30,000]."

Oral evidence to Inquiry, March 1st 2004,
Richard Charkin (CEO, Macmillan)

£30,000 is indeed a lot of money. But *Nature* clearly spends nothing like that on each research article that it publishes.

There are several major problems with the calculation that was used:

1. A significant fraction of Nature's £30m revenue is spent to commission and produce the non-research-article content of the journal (*e.g.* News & Views articles, book reviews, commentaries, editorials etc.) This non-research content would continue to drive healthy print and online subscription revenue, even if the research articles were made freely accessible online. Since the non-research content (the front-matter) is far more widely read than the research articles themselves, it is far from clear whether making the research articles Open Access would have *any* negative impact on subscription revenue. In fact, the opposite can be argued.

2. For the same reason, there is no reason to believe that Nature's impressive advertising revenue would suffer dramatically as a result of Open Access, yet they are assumed to fall to zero in *Nature*'s calculation.

3. Part of the argument used to justify the high cost per published article is that *Nature* rejects more than 90% of papers submitted, and so has to review more than 10 papers for every one it publishes, and has to bear the entire cost of this. Continued →

"*[Nature] publishes fewer than 10% of the research articles submitted. Economics dictates that high quality journals like Nature have a high unit cost per paper published, because for every article published more than ten have been reviewed and de-selected.*"

Letter to Inquiry, January 13th 2004,
Richard Charkin (CEO, Macmillan)

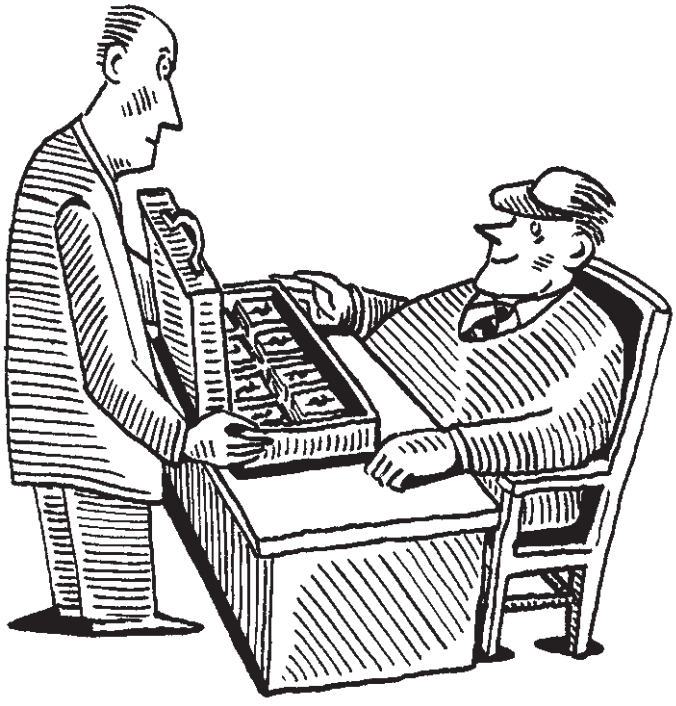
> This would indeed be expensive, and it is true that the repeated peer-reviewing of rejected papers as they trickle down the journal pyramid is one of the worst inefficiencies of the present system. In fact, however, *Nature* is not that profligate and had already taken steps to address this issue:

"*If a paper cannot be accepted by Nature, the authors are welcome to resubmit to Nature Cell Biology. Nature will then release referees' comments to the editors of Nature Cell Biology with the permission of the authors, allowing a rapid editorial decision. In cases where the work was felt to be of high quality, papers can sometimes be accepted without further review*"

From the Nature website

> Thus, if a paper is scientifically sound, but is not exceptional or fashionable enough to appear in Nature, it may well be submitted and accepted into one of the next tier of journals in the Nature stable (*Nature Cell Biology*, *Nature Medicine*, *Nature Genetics* etc.) without requiring significant additional editorial work or costs. This is a very sensible system, and is one that is already in use at BioMed Central. If an article is rejected for publication in BioMed Central's top-tier journal, *Journal of Biology*, but is judged by the reviewers and editors to be scientifically sound, the authors may be offered publication in one of our more specialist journals. Public Library of Science plans to operate a similar mechanism as it launches new journals.
>
> This trickle-down approach benefits authors by avoiding the delays caused by repeated rounds of peer-review, and benefits science as a whole by reducing the cost of the publication process while maintaining quality.

Taken together, the above factors make it clear that the actual figure that would be necessary as an author charge for *Nature* would most likely be vastly lower than the suggested figure of £10,000-£30,000. It is even possible that Nature could operate at a profit while offering Open Access to research content and making no author charge whatsoever.



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Myth 10. Publishers need to make huge profits in order to fund innovation

"In the last seven years we have led the industry and the scientific publishing world to on-line. I think most people would agree we have pioneered it through ScienceDirect and through the electronic platform. That would not have happened if we did not have the scale to invest what turned out to be in excess of £200 million to develop the Science Direct on-line platform"

Oral evidence to Inquiry, March 1st 2004, Crispin Davis (CEO, Reed Elsevier)

Response

Elsevier cannot realistically claim to have led the transition of scientific publishers from print to online – that was done by smaller, more nimble operators such as HighWire Press (which launched the *Journal of Biological Chemistry* in 1995) and BioMedNet (which made the Current Opinion series of journals available online in full text form back in 1994). Of the large commercial publishers, Academic Press started IDEAL in 1995, years before ScienceDirect. Similarly, Elsevier's figure of £200 million for the development costs of ScienceDirect is more an indication of corporate inefficiency than of innovation.

Huge investment by a large corporation is not the best driver of innovation, especially in the modern connected world. The explosion of the Internet has shown that open platforms are the real spur for innovation. The open standards of the Internet mean that anyone can create a website and offer any imaginable online service, and it will be instantly accessible by all Internet users world-wide. The result has been an unparalleled wealth of innovation, which goes far beyond what proprietary online services had previously achieved.

Open Access to the scientific literature holds the promise of the same benefits for science. Once the majority of the scientific literature is Open Access, in the full sense of being openly re-distributable and re-usable, the entire scientific community will be free to develop and improve techniques to mine and explore that literature. They will not be constrained by any one corporate budget or policy, nor by the barriers inherent in the current fragmentation of the literature. At this point in time we can only imagine what is possible, but it is certain that it will dwarf what any one company might achieve.

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Myth 11. Publishers need to take copyright to protect the integrity of scientific articles

"If your author's work is then stolen or changed, what publishers can do because of their scale and their reach is to do something about that. Individual authors would find it very difficult if their article was used and changed"

Oral evidence to Inquiry, March 1st 2004, John Jarvis (Managing Director, Wiley Europe)

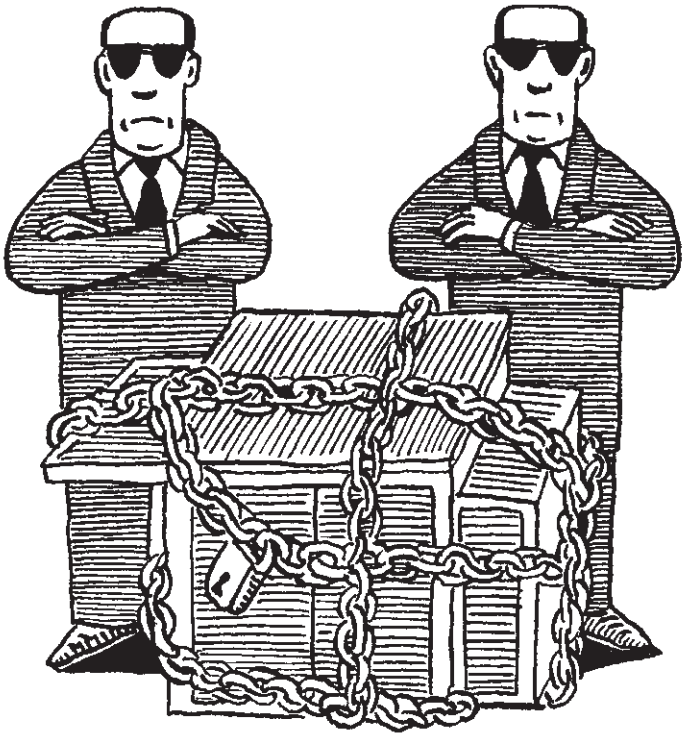
Response

Scientific integrity is protected not by copyright law, but by the norms, standards and processes of the scientific community. An article is only "stolen" from an author if it is mis-attributed. This is fraud, and laws other than copyright deal with fraud.

It is exceptionally rare for a scientific publisher to use copyright law to defend the integrity of a scientific paper on behalf of an author. In fact BioMed Central knows of no situation where this has happened.

The "scientific integrity" argument simply provides a convenient excuse, which is used by traditional publishers to attempt to justify their requirement for transfer of copyright.

Meanwhile, the real reason for copyright transfer is clear. Publishers regularly use copyright law to protect the profits they derive by controlling access to the literature. For example, in ongoing litigation, Elsevier and Wiley are suing various US photocopying firms for, amongst other things, including copies of research articles in student course-packs without paying royalties to the publisher:



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Sources

- Blackwell Publishing written submission to House of Commons committee (not available online)
- Elsevier written submission to House of Commons committee
- Macmillan letter of evidence sent to House of Commons committee (not available online)
- Royal Society written submission to House of Commons committee
- Quotes from oral testimony are taken from the uncorrected transcript of the House of Commons committee session that took place on March 1st 2004