nature webdebates

Healthy warning: "This journal supports full text, tariff-free archives"

Colin Hopkins
Professor of Molecular Cell Biology, Imperial College, London, UK
Pericentriolar@cs.com

The scientific, technical and medical (STM) publishing market has been largely shaped by the economics involved in producing and distributing print journals. The arrival of electronic publishing makes it urgent to reassess this model and develop new ones that can serve science better.

The current debate on scientific publishing has shown that disseminating reliable research results in the STM sector is a large, complex, and often hugely profitable business. The market is largely dominated by leviathan commercial publishers, although smaller learned societies and other not-for-profit publishers sustain a flourishing public sector. For example, Reed Elsevier's acquisition of Harcourt's 500 or so journals, a move approved in July by the UK Department of Trade and Industry, means that the company will own 1700 journals, extending further its control over the STM journal market. Last year, Reed Elsevier's STM publishing arm, Elsevier Science made profits of US$3,525 million on a turn-over of US$9,702 million, generating one billion US$ of dividends to its shareholders. In August this year it reported a 17.5% profit; the only company to resist the fall in the dot com sector.

The large publishers who dominate the print journal business seem determined to control electronic publishing, and are seeking to extend the restrictions to access that characteristised the print system to electronic publishing, as if these were inalienable rights. The most important of these restrictions is publishers' control of primary research papers through the acquisition of indefinite copyright.

Copyright, originally intended to protect the creativity of authors, is now so thoroughly incorporated into scientific publishing that the business plans of most commercial publishers have become absolutely dependent upon it. Anguished accounts from librarians tell how some publishers have used the dominance this confers to ratch up profit margins. In the electronic era copyright control also allows commercial publishers the flexibility to package and sell a plethora of specialist, low-impact journals in online bundles, a strategy that reinforces their grip on the market.

Most contributors to the recent debate seem to accept that publishers require some degree of copyright control. They understand that the copyright that publishers acquire when they accept an author's manuscript for publication underpins the arrangement whereby publishers obtain library subscriptions, the major source of income they require to cover costs and generate revenue. Both public and private publishers consider copyright to be essential to their survival. Inevitably, suggestions that it should be radically modified have generated some of the most spirited exchanges in the current debate.

Rift emerging between commercial and not-for-profit publishers

Many learned societies depend on the copyright model to generate substantial revenues from their journal businesses, which they often use to subsidize their other activities. The greatest benefit stemming from the debate prompted by the Public Library of Science's (PLS) boycott threat – its petition has been supported by around 27000 signatories - has perhaps been the acceptance by many non-profit publishers in life science that they should not exercise copyright on papers indefinitely. Many see this as an acknowledgement that copyrights on primary research papers are not so much owned by publishers as held in trust for the scientific community. It is too soon to say whether new business models that do not depend on long term copyright will be feasible, but many not-for-profit publishers are now experimenting and making papers freely available to electronic searching after a short delay. To date, however, none of the commercial publishers have made concessions on this front, arguing that they will need to see viable alternative business models before they consider change.

PLS has not demanded that copyright on scientific papers be abolished, but rather that limits be put on its duration. The problem then, is not the existence of copyright controls *per se*, but the fact that publishers currently hold them in perpetuity. This was not a contentious issue in the print era, and indeed for purposes of quality control made sense, but it lies at the core of the present dispute over electronic publishing. In future, all published results will be housed in electronic archives of some form, and the possibilities for search and retrieval will expand enormously. The electronic search facilities of these archives provide an unprecedented opportunity for increasing the intellectual harvest from published work. To be exploited fully for scientific purposes access to these archives needs to be free. To be exploited fully for commercial purposes copyright control needs to be prolonged and if possible indefinite.

To resolve this conflict new business models are needed -- that much is abundantly clear -- but if they are to serve the interests of the life science community I would argue that they must exclude indefinite copyright controls. Publishers will also need to come to terms with lower profit margins than they have enjoyed in the past from print journals (see http://lifescienceconnect.mcbl.ucl.ac.uk). *The Economist* estimated recently that the market for on-line biological information is worth $10 bn; it is therefore difficult to imagine that relaxing copyright control will discourage e-publishing entrepreneurs from inventing new business models.

A new lease of life for niche journals

The dangers of relaxing copyright controls are a particular concern to editors of low-circulation journals, the so-called niche journals. These concerns are echoed (but, I suspect, for rather different reasons) by the large commercial publishers who bundle these titles into marketable packages. And it is true that such journals would be vulnerable since there are many influential scientists who believe that a wide-ranging cull of low-impact titles would be no bad thing. But this is surely too narrow and short sighted a view. Disparagements of niche journals are invariably expressed by people working in cutting-edge fields who feel that the only research that matters is published in high impact journals. Applied biologists, and clinical scientists will vigorously disagree. And, since it can be argued that electronic archives promise niche journals visibility beyond anything they could have hoped for on library shelves, there must now be real hopes that the results they contain can be judged more on their intrinsic value rather than on their current appeal to the editorial boards of high impact journals.

In the past it was difficult to economically justify thousands of niche journals in print but the convergence of the post-genome era and electronic publication heralds a renaissance in the scientific case for such journals. Now that the genome is being annotated, it is the niche journals that will publish the detailed characterizations of genes and proteins. These will rarely be fodder for high-impact journals, but nonetheless will collectively underpin much of biological research. For biologists swamped with information, the availability of electronic search technology could not be more timely. To characterize genome function, it is imperative that such papers are available for efficient retrieval from comprehensive full text databases, and for that access to be free.

Provided the coverage of the databases is large enough, kingdom-wide searches for the underlying principles of functional mechanisms could become routine undertakings. There would also be profound

benefits for life sciences as a whole. With print based publishing the information contained in the niche journals, each with its own subscription barrier, has become hopelessly fragmented. We now have a golden opportunity to reunify biology by being able to search, link and match across a swathe of papers, breaking down the boundaries between disciplines, and sub-disciplines, to create a seamless literature. The synergies that will flow from this will benefit all scientists.

Creating a competitive scholarly e-publishing environment

Unfortunately, the embryonic barrier-free archives in the public sector are experiencing difficulty in achieving the critical mass they need to take-off. To be effective, these databases must provide sufficiently comprehensive coverage of the literature, and this requires attracting the content of large numbers of titles from across the commercial as well as the academic spectrum. To present credible alternatives to the online schemes now being marketed by large commercial publishers, public archives also need to expand their portfolios of titles at rates comparable with those being achieved by mergers and acquisitions in the commercial sector.

Why are commercial publishers so intent on holding onto copyright control indefinitely? Reducing the length of their copyright control to months or one or two years is not likely to cause unmanageable damage to their current businesses. The answer is that many of them are planning to transform the online market by selling access to the vast archives of already published literature they are building through acquisition of new titles and digitization of back issues. The business model of such schemes, such as Elsevier's ScienceDirect, is, of course, crucially dependent upon publishers being able to maintain their copyright controls in perpetuity.

A competitive academic sector in e-publishing is not the hopelessly idealistic prospect it was when commercial publishers dominated printing and distribution. Already, for example, a molecular cell biologist seeking to publish in journals with limited copyright embargoes can choose from a large selection of journals, such as the *Proceedings of the National Academy of Sciences USA*, *Science*, *Molecular Biology of the Cell*, the *Journal of Cell Biology*, the *Journal of Biological Chemistry* and the *Journal of Cell Science*. With such a rich quality of choice it is not unrealistic to hope that academic archives giving free access to full text papers can ultimately provide the core repository for scholarly publishing.

With regard to finance the most obvious way to accelerate this change in the life science publishing system, would be for grant agencies to redirect the funds now used to purchase subscriptions towards funding authors to pay to have their papers published for free-access. The costs of web publishing are high, but it should be possible to offset the required increase in grant funding by savings in print production costs. This will put even the smallest journals in the happy position of being able to collect most of their costs up front; the time for the page-charge business model has come.

But the opportunities of on-line publishing will be fully exploited only if the scientific community chooses to use its influence. To be effective they need to know the copyright policy of the journal to which they are planning to submit their paper. Knowing this, and acting accordingly, a two-tier system should soon emerge in which copyright-free public archives could begin to compete with publishers who maintain copyright barriers. Initially there would be real prospect of two literatures developing - those in the commercial sector, surrounded by tariff barriers and passwords, and freely accessible archives created by the not-for-profit publishers. And, taking the human genome sequence as a precedent, commercial publishers would, of course, also have free access to use and repackage papers held in public sector archives. But if the scientific community were to take up this campaign with any enthusiasm and support only publishers that contributed to free access archives, publishers that with-held their material from the freely accessible academic archives would quickly appreciate there are commercial risks in leasing rather than selling intellectual property back to the science community.

Responsible publishers who genuinely wish to see barrier-free archives develop to the level needed by the science community, should perhaps be given the benefit of the doubt. Some sincerely believe that making an immediate commitment to reduce the duration of copyright could endanger their operations, and feel that they need time to explore alternative business models. In this transition period, such journals could print an 'in principle' commitment along the lines of "This Journal supports full text, free access archives" in each issue of their journals. Noting the absence of such a commitment in other journals, editors, authors and readers could then conclude that these journals intended to retain copyright controls indefinitely.

The tariff barriers of digitized archives are of little interest to government regulators, because their primary concern is to whether scientific publishing should be public or private sector. As the recent UK Competition Commission Report on the Reed-Elsevier merger shows they have little interest in monopoly issues. The fate of barrier free archives for full text material lies, therefore, entirely in the hands of the scientific community. The PLS petition testifies to the huge support of scientists, but mounting a credible challenge to the large commercial publishers, will require winning the support and commitment of not-for-profit and commercial publishers to the cause. By the end of this year the die will have been cast - if, by then, a sufficient number of journals carry unequivocal declarations of support for full text, tariff-free archives, the scientists' campaign will have been given a new lease of life.

1. Journal Wars, *The Economist*, May 10th 2001.