

believe that printed issues, or at least tolls in the form of subscriptions and site licences, will continue indefinitely.

ESA began selling immediate free web access in January 2000. During the first two months of the service, authors bought it for 13% of articles, rising steadily to 59% during March and April 2001. The price for the service is currently 75% of the price of 100 paper reprints, for example \$90 for a 7-page article. This price provides a greater profit margin than for paper reprints, which are expensive to produce and deliver. Immediate free web access requires only that the PDF file of the article is made freely accessible on ESA's web server.

If immediate free access is a profit-making service that many authors want and will pay for, why is ESA apparently the only publisher that sells it? For scientific societies, the answer is probably that their institutional inertia is great and their members have yet to lobby for it — as ESA members did. Commercial publishers may fear that selling immediate free access to those who want it may lead to all authors buying it, in which case revenues from subscriptions and site licences might cease.

On the other hand, societies have supplemented modest incomes from lower-priced library subscriptions with member dues and page charges. Without journal subscriptions, societies and commercial publishers will collect page charges to pay for refereeing, editing and composing. Publishers will pay nothing to make the articles freely web accessible, because research libraries and PubMed Central will post them without charge.

Authors should encourage publishers to provide immediate free access at a fair price. Other things being equal, many will prefer to publish in journals that provide it, especially as electronic literature indexes begin linking directly to the e-versions of articles. Most authors would like nothing better than for their articles to be available in full text, without tolls, via links in widely used literature indexes.

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Impact factors, and why they won't go away

Sir — Brunstein in Correspondence¹ asks whether online publishing will herald the end of impact factors. Unless he is forecasting the end of print publications altogether, this is doubtful. Were print journals to disappear, however, I am confident that a new impact factor would be invented. Information scientists are

already computing web impact factors².

It would be more relevant to use the actual impact (citation frequency) of individual papers in evaluating the work of individual scientists rather than using the journal impact factor as a surrogate. The latter practice is fraught with difficulties, as Seglen and others have pointed out³. As long as scientists publish articles containing lists of cited references, it will be possible to calculate impact factors. It is to be hoped that citation practices on the web will become sufficiently standardized to permit accurate calculations.

It will be necessary to distinguish between citations to URLs for research articles, on the one hand, and, on the other, to readerships as reflected in 'webometric' studies measuring web activity. One ordinarily assumes that there are many more readers than citers, but there is a widespread mythology that authors are cited more than they are read!

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1. Brunstein, J. *Nature* **403**, 478 (2000).
2. Bjorneborn, L. & Ingwersen, P. *Scientometrics* **50** (1), 65–82 (2001).
3. Seglen, P. O. *Br. Med. J.* **314**, 498–502 (1997).

Evolution is what's needed, not revolution

Sir — In the current debate on web availability of peer-reviewed scientific literature there seems little attempt to retain the advantages of the present system of journals.

These are, first, the element of specialization (the journal's field) and, second, the quality and novelty of the science the journal demands for publication (its place in the pecking order).

Both aspects are crucial, as authors wish their articles to be immediately read by the appropriate audience and to accrue the kudos appropriate to the significance of their work. So any universal web-based system must accommodate these two aspects.

This could be achieved if existing journals were replaced by equivalent websites that were run not by commercial publishers but by the learned societies on a non-profit basis. Provided the societies did not use their sites to generate extra income, they could keep costs to a minimum.

Reviewing could be carried out as now; the costs would be covered by page charges to authors (for both accepted and rejected submissions), and by small charges for web access to published articles. The subscription charges would be scaled: relatively high for an institution

subscribing for the benefit of all its staff, at intermediate level for an individual laboratory, and very low for a personal subscription.

Control of access could be through the pre-designated IP addresses of the servers and individual terminals of subscribers. Thus an individual laboratory could have online subscription to its favourite sites for a fraction of the cost that it must now pay to get them as printed journals. If a library wanted paper on its shelves, it could either pay the site to sell it what we currently call a 'journal' or it could have a licence to print the content out as part of its institutional subscription.

A great deal of the effort for web publication (for example, generating PDF versions of text and figures in the house style of the site) can be undertaken by the authors, since they are the keenest to see the article in the public domain.

The current requirements for publication in the *Journal of Biological Chemistry*, in which every aspect is electronic, show that this is a straightforward procedure, which, while not cost-free, is not prohibitively expensive when printing costs do not have to be covered.

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The Net is many people's only chance of access

Sir — Pakistan is not on the publishing map. I doubt if the collective population of 140 million manage to subscribe to more than a few costly journals. On the other hand we have only about 300,000 computer users. Withholding full text from a country such as Pakistan is thus ridiculous. I would suggest that full text should be made available to everyone on the Internet. This would not affect journals financially, since most people using this service in countries such as Pakistan would never be able to subscribe to them.

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Erratum In Stevan Harnad's Commentary on freeing the scientific literature (*Nature* **410**, 1024–1025; 2001), the estimate of the minimum cost of peer review was not from the American Institute of Physics but from a summary of a group discussion by Mark Doyle of the American Physical Society. The \$500 estimate used in that discussion included only peer-review costs, not post-acceptance costs. The URL for the estimate is: <http://documents.cern.ch/archive/electronic/other/agenda/a01193/a01193s5t11/transparencies/>.