

ICSU Press Workshop on Electronic Publishing in Science, Keble College, Oxford, UK, 30 March—2 April 1998—some observations

This three-day conference, officially titled 'Economics, Real Costs and Benefits of Electronic Publishing in Science—A Technical Study,' was planned to follow up on the Joint ICSU Press/UNESCO Conference on Electronic Publishing in Science that was held in Paris, France, during February 1996 (*Chemistry International* 1996, Vol. 18, pp. 165–169). The Oxford workshop attracted around 50 participants, about half of whom had been present at the Paris conference. Moreover, essentially all the organizations represented in Paris were again represented in Oxford. This useful continuity, together with the smaller size of the Oxford Workshop (50 vs. 150 in Paris) made for an unusually stimulating and interactive three days in the comfortable modern facilities at Keble College's ARCO Building.

Sir Roger Elliott (Chairman of ICSU Press and a former chief executive of Oxford University Press) set the stage for the meeting by challenging the attendees to describe an electronic publishing system for science that would have a number of desirable characteristics: (1) Gives authors' works visibility, with adequate quality control; (2) Can be accessed easily; (3) Preferably costs less than the current system; and (4) Provides adequate incentive and financial return to those (such as publishers) who 'add value.'

Fred Spilhaus, Executive Director of the American Geophysical Union, predicted that the present scientific publishing system was nonlinear, and that substantial, unpredictable changes would inevitably take place. He observed that the boundaries between 'chit-chat' and formal publication were becoming distinctly blurred in the electronic arena and that electronic enhancements will become both more complex and more costly. Anent Parekh, Professor of Physiology at Oxford University, expressed the enthusiastic view of many young academics, that electronic publishing offers users many advantages and relatively few disadvantages. Among the features Parekh found most helpful were currency, ease of access (including access from one's home computer) and the ability to look at and download additional data not usually printed in the paper journal. Donald King (King Research, Ann Arbor, Michigan), Terry Scott (until recently with the American Institute of Physics), and Owen Hanson and Robert O'Shea (Lindsay Ross International, Abingdon, UK), all pointed out that a comparison between the costs of conventional (paper) pub-

lishing and costs of electronic publishing must be conducted with great care. King stressed the need for a careful definition of terms, while the others emphasized that many costs (for example, those for peer review) do not disappear in the electronic publishing system and that there is no reason to believe, as some have suggested, that electronic publication is inherently less costly than paper publishing. Indeed, many enhancements in the electronic system—for example hot-linking and graphics display improvements—actually increase cost, they stressed. William Mischo (University of Illinois, Champaign-Urbana) described some of the technical difficulties inherent in archiving electronic journals, including the still substantial cost of archival storage, despite large decreases in storage device costs in recent years. He also raised the disturbing issue of the questionable readability in future years of outmoded storage vehicles such as 5¼-inch floppy disks and current-technology CD-ROMs. Bernard Donovan (Association of Learned and Professional Society Publishers, UK) had surveyed a number of publishers and concluded that substantial costs were incurred by scientific publishers in their conduct of peer review. He estimated such costs as typically between 100–300 GBP per accepted paper. Fytton Rowland (University of Loughborough, UK) challenged the assertion that users would find electronic publications so accessible and easy to use as to render librarians redundant. Indeed, he contended that the librarian and information intermediary functions will continue to be needed as never before, to cope with the variety and rather chaotic arrangement of materials on the Internet. Gary VandenBos and Susan Knapp (American Psychological Association) described a new all-electronic journal published by the APA; this journal has 2500 individual users, currently accessing it for no charge. However, there had been, and continued to be some resistance from potential authors and more resistance than expected from reviewers. Knapp also described an innovative pricing arrangement (still experimental) under which APA members with a print subscription to at least one APA journal could purchase in addition, at a very attractive price, access to a full-text database of all APA journals and/or to the Psychological Abstracts database. Knud Thomsen, a participant in a working group of scientists at fusion energy facilities scattered over many parts of the world, described the characteristics and problems of their system for mutual communication over the Internet. Many of these problems—for example, use of incompatible software versions and different e-mail systems—are extremely

germane to electronic publishing on 'the Net.' Abel Packer (Pan American Health Organization, Sao Paulo, Brazil) and Virginia Cano (Queen Margaret College, Edinburgh, UK) explained why scientists in developing countries are attracted to the possibilities of publishing electronically. Fundamentally, this attraction is related to the relatively low barriers inherent in operating a web site, provided that the web host possesses the ability to offer material in English, now the scientific 'lingua franca' of choice world-wide. Visibility can quickly be obtained electronically, but progress is still too often hampered in many countries by poor infrastructure (telephone system) and by a lack of computer availability or literacy. The same points were made by Attlio Bustos and Graciela Munoz (Catholic University of Valparaiso, Chile), who have developed the *Electronic Journal of Biotechnology* in Chile. Vitaly Nechitailenko (National Geophysical Committee, Russian Academy of Sciences) described some of the special problems posed by offering on-line a journal having extensive mathematics, where HTML representation is in some respects deficient.

Summarizing the status of a fast-moving and technologically sophisticated field such as electronic publishing is no mean feat, but workshop attendees attempted it with the assistance of David Pullinger of Macmillan Publishing and of the chairs of three break-out groups to which all attendees had been assigned during the last sessions of the workshop.

The following principal conclusions were among those generally agreed to by participants:

- 1 Electronic journals will become dominant (over conventional paper publishing) in the next 5–15 years.
- 2 Peer review and methods to 'brand' (indicate the quality of) electronic papers will be indispensable to successful electronic publishing.
- 3 Despite widespread expectations that electronic publishing will be less expensive than paper publishing, every evidence to date indicates that it may be just as expensive or even more expensive, de-

- pending on the sophistication and cost of electronic enhancements such as live graphics and hot links.
- 4 Publishers generally have done a poor job in the past explaining to authors and librarians how they have added value to authors' work. (This explains in good part why there exists the wrong expectation described in Conclusion no. 3, above.)
 - 5 The ability to gather detailed information on the searching habits of scientists when they access electronic publications will pose ethical questions for publishers. Users should be informed about any information gathering practices used by electronic publishers.
 - 6 The infrastructure—telephone systems, networks, etc.—that is in place in advanced countries will continue to need maintenance; in developing countries, and even in some developed countries, large capital investments are essential if the citizens in those countries are to share in the benefits of electronic publishing and other services made available via the Internet. Inevitably, government agencies will be looked at as the source of these investments.
 - 7 Everyone agreed that there is an urgent need to maintain archives of electronic publications. But who should be the keepers of the archives? Conferees had little confidence in the willingness or ability of national governments or of commercial publishers to undertake this vital task. Not-for-profit scientific societies—presumably having an obligation to assure access to the record of their various disciplines—were seen as the most logical candidates for this Herculean task.
 - 8 Electronic publishing has reached an exciting stage. There are now a sufficient number of 'products' in the marketplace that the next few years will bring a great deal of practical knowledge about how technical users react to these products, how they use them and—the \$64 000 question—how much they are prepared to pay.