Traditional, the learned journal has served as the primary medium for scholarly communication, legitimizing and assessing scholarly discourses and intellectual labour, and facilitating the academic review and reward process. Electronic publishing may now have the potential not only to share this function, but also to revolutionize method of research and collaboration.

Until recently, the form and functions of the print journal have remained stable. However, the recent explosive development of information technology is challenging the traditional conceptions of scholarly communication and publishing, and academics are discovering that networking tools open new kinds of research practice and scholarship impossible within a print paradigm [1]. The new technology is particularly welcome since the traditional publishing system is in crisis.

Since the 1960s, the number of articles and new journals have skyrocketed. For example, over half the language and literature journals available were inaugurated after 1970 [2], and nearly half of the one million papers in mathematics were published only in the past decade [3]. This tremendous increase in serial publications, coupled with spiraling subscription costs and shrinking library budgets, are driving what many describe as the "crisis in scholarly publishing." [4] While researchers are finding it impossible to keep up with the literature in their fields, libraries are finding it increasingly difficult to maintain their current serial collection, let alone acquire new titles. The "de-acquisition" of journals, particularly those that have small readerships and are too costly to maintain, is commonplace among libraries. As a consequence, the ability of university libraries to provide faculty with needed published information has been steadily eroding [5].

Scholarly publishing is clearly at a crossroads. Academics have tough choices to make: leave the journal system as is, and face further erosion of access to information, or form a partnership with technology specialists, librarians and learned societies to develop high quality network-based electronic publishing projects [6], making the results of their research available at a lower cost [7].

Strong evidence that scholars are increasingly adopting the latter route can be seen in The Directory of Electronic Journals, Newsletters and Academic Discussion Lists, the standard reference work on serials and other academic forums available on the Internet.

The 6th edition of the Directory [8], published by the Association of Research Libraries, and released in July of this year, shows a 257% increase in e-journals and a 26% increase in academic
discussion lists since the 1995 edition [9]. Since 1991, when the Directory was first published, the number of discussion lists has risen from 517 to 3,000, and journals and newsletters from 110, to the current 1,688.

At present, most of the e-journals do not have a paper-based counterpart [10]. The majority of academic e-journals are free, and most are non-refereed. But the number of peer-reviewed e-journals, many sponsored by learned societies, is increasing steadily [11]. There are now over 100 refereed science, technology and medical e-journals, and many more will be launched in the coming year [12].

Interestingly, e-journal publishing is not restricted to the sciences and computer-related fields, where practitioners are expected to be more adept at information technology. Titles like Postmodern Cultures, Internet Archaeology, Sociological Research Online, and Nordic Linguistic Bulletin [13], clearly show that interest in e-journals spans the range of academic disciplines. Indeed some of the earliest e-journals originated in the Humanities, the Bryn Mawr Classical Review [14], a journal devoted to the review of books in the classics, being exemplary.

At present, the World-Wide Web, supported by the hypertext transfer protocol (HTTP), appears to be favoured by most new journal publishers [15]. Indeed, web journal publishing offers several advantages over the existing print model.

Until recently, presentation of scientific data and results were restricted both by printing cost and by the limitations of two-dimensional representations. Because of its ability to incorporate digitized audiovisual information and high resolution graphics, web-based publications can offer new means of visualization and richer representation of data and results [16].

With electronic media and the decreasing cost for storage, the possibility also exists for the publication of all the primary data on which research is based. By offering authors' raw data and the software used in its analysis, readers will be able to duplicate, reanalyze or reinterpret an author's work. Such practices may radically redefine collaboration and resource sharing [17].

Furthermore, readers of web documents can easily travel, through hypertext links, to related articles or other journals, and to geographically dispersed resources such as museum collections or rare archival material [18].

The accumulation of such related links will resemble a cumulatively developing database on a research problem. Thus, rather than being a bounded volume of somewhat related articles as in the print model, an e-journal may represent an evolving archive of on-going research and interconnected resources, with researchers from around the world contributing to its growth. Such a scenario is already occurring on the Net, in fields as diverse as molecular genetics and renaissance studies [19].

Because electronic publishing is not tied to page budgets, print runs, and production schedules, e-journals provide much greater flexibility than do traditional periodicals. An individual article can be published as soon as it is reviewed, accepted, and corrected, without having to wait for other articles to form an artificial issue. On the other hand, special theme issues and conference proceedings can be published when demands arise [20].

Understandably, not all scientists and academics are equally impressed with e-publishing. Indeed, the nascent practice of e-journal publishing raises a number of serious questions and challenges that e-journal enthusiasts often fail to acknowledge.
Of foremost concern is whether e-publications will be accorded the same status as print journals. Many are concerned about how the peer review system will be maintained, and whether quality of e-publications will be controlled. Indeed, given the diversity of forums (such as listservs, e-conferences and seminars, document archives and e-journals) in the networked environment, many question what constitutes an electronic publication, let alone its quality control [21]. To skeptics, the Internet represents a global vanity press, where the onus of sorting the good from the bad rests solely on the reader. Without the prestige hierarchy of print journals, the editors' seals of approval, and the yardstick for "minimum publishable unit," how would tenure and promotion committee members evaluate e-publications?

There are also legitimate concerns with the textual integrity of e-publications. Given the fluidity of the electronic medium and the ease with which digital documents can be altered, plagiarism and unethical use of data and resources is easy.

The fluidity of electronic documents and their dependence on computer for decoding poses further problems. Will e-publications be permanently archived and preserved by academic libraries? Will the constant arrival of new software and storage media render existing electronic documents obsolete? Will e-publications be adequately indexed and easily retrieved? And how will existing copyright regulations cope with publications in the electronic environment? These are key questions that have been hotly debated [22].

Many practitioners of electronic scholarship are confident that as more scholars take to the Net, methods of solving such problems will emerge. A number of e-journal supporters have argued that the procedure of peer review is entirely independent of the medium and there is no reason why peer review will be absent in the electronic environment [23]. Others have added that the powerful bibliometric (indexing and searching) tools that are available on the Net will permit more precise and dynamic citation analysis, allowing assessment focused on post-publication significance. Such a practice may reduce the preoccupation with quantity that has characterized much of academic evaluation [24].

While e-journals and electronic documents are more difficult to classify and catalogue than printed artifacts, the problems associated with their storage and retrieval will likely soon be resolved [25]. The two key players of scholarly communication in Canada, the National Library of Canada and the Canada Institute for Scientific and Technical Information, have been developing policies concerning electronic publications. They are committed to the preservation of scholarly materials, whether they are in print or in electronic forms [26]. So while there is no guarantee that network publications will be preserved forever, the fear that they will fast become obsolete may be exaggerated.

Despite the potential of electronic publishing, many academics will continue to resist it because such a move will alter, in a substantive way, their scholarly habits. Unless influential academics and institutional leaders reexamine the way intellectual labour is valued and rewarded, e-publications, no matter how good, are unlikely to be recognized. Until such recognition exists, faculty, particularly young non-tenured members, will be reluctant to publish electronically.

Encouragingly, there are signs that Canadian universities may consider electronic scholarship more seriously. A discussion paper from the joint Association of Universities and Colleges of Canada/Canadian Association of Research Libraries Task Force on Academic Libraries and Scholarly Communication, stresses the need for cooperation in giving electronic publishing greater
status [27]. Perhaps such cooperation will overcome conservative habits, allowing exploration of the potentials of new electronic technology.

In the meantime, copyright issues arising from electronic publishing remain to be dealt with in a third phase of federal copyright reform [28].

Please send comments to Leslie Chan: Chan@scar.utoronto.ca

Notes and Hyperlinks:

[1] Much has been written about new scholarly practices in the networked environment. My favorite commentaries are:

- *St. Augustine to NREN: The Tree of Knowledge and How it Grows*, by James J. O'Donnell
- *Post-Gutenberg Galaxy: The Forth Revolution in the Means of Production of Knowledge*, by Stevan Harnad, and
- *A Potency of Life: Scholarship in an Electronic Age* by Willard McCarty.

Professor McCarty has also constructed a very useful [Overview of electronic publication](#) web page that outlines the various formats and electronic publishing projects on the Internet. It's a good starting point for exploring the typologies; and scope of current e-publishing ventures.


[3] Andrew Odlyzko, mathematican and research scientist at the AT&T Bell Labs, came up with this extraordinary estimate in his much discussed article "Tragic Loss or Good Riddance? The Impending Demise of Traditional Scholarly Journals." Referring particularly to mathematics and the natural sciences, Odlyzko argues in this article that the potential of electronic technology renders traditional publishing superfluous.

Similar pronouncement of the imminent demise of the print journal has been made by scholars in other fields: "Last Writes? Re-assessing the Law Review in the Age of Cyberspace" by Bernard Hibbits (University of Pittsburgh School of Law); "The death of biomedical journals" by Ronald E LaPorte et al.

[4] For the librarians' perspective on the challenges facing universities and scholarly communication, see the [The Crisis in Scholarly Publishing](#) web site at the University of Waterloo library.
The spiraling increase in journal subscription cost, ownership of copyrights by commercial interests, and related matters are discussed in the electronic Newsle tter on Serials Pricing Issues.

Much useful information regarding trends in the volume of acquisitions, the worldwide pool of publications from which such acquisitions were made, prices of monographs and journals, and library expenditures are available in the Mellon Report on University Libraries and Scholarly Communications.

Many such collaborations are already in existence. For a comprehensive listing of electronic as well as print publications sponsored by learned societies, see the Full- Text Archives of Scholarly Society Serial Publications (Scholarly Societies Project, University of Waterloo Library).

Partnerships between learned societies and university presses for e-journal production are also increasingly common. For example, Stanford University recently launched The Network Publishing project, dubbed "The HighWire Press," in an attempt to "re-engineer" traditional scholarly publishing to focus on formal, structured communication among the community of scholars." Examples of new e-journals can be found at the HighWire Press home page.

In the UK, the Electronic Libraries (eLib) programme, funded by the Joint Information Systems Committee (JISC), is sponsoring the Open Journal Project. The aim of the project is "to provide a framework for publishing journals in a network environment such that maximum access to (and from) the publications is ensured. This involves bringing the journals 'alive' with large numbers of hypertext links created with the Distributed Link Service and information mining agents." See the Open Journal Project homepage for examples of new e-journal projects.

The actual cost saving of e-journal publishing has been much debated. The Virtual Product branch of Industry Canada recently commissioned a study on the economics of ejournal publishing in the Humanities and Social Sciences. Details of the study, written by Dr. Vijay Joy of Carleton University, are available in the report Cost and Revenue Structure of Academic Journals: Paper-based versus E-journals (1995). According this study: "the costs of producing and distributing a new e- journal can be 28 to 48 percent lower than that of its paper-based counterpart. This does not include savings accruing to on-line peer review and submissions, since this is possible regardless of output format. Our estimated savings, however, can be offset almost completely by a reduction in subscription revenues. This is especially important for an existing paper-based journal considering switching to an electronic format. In either case, the net loser will be the commercial printers, whose revenues will disappear." A related report, Funding Electronic Journals on the Internet, by Tony Hofmann, is also available on-line.

Information on how to obtain the 6th edition of The Directory of Electronic Journals, Newsletters and Academic Discussion Lists is available at the Scholarly Communication Program at the Association of Research Libraries.
The 5th edition of the Directory is available for searching at the Hyperjournal web site. The Hyperjournal web site, the NewJour archive, and The World-Wide Web Virtual Library: Electronic Journals are good places for tracking the explosive growth in on-line serial publishing and for seeing what is available in particular subject areas.

It is important not to confuse true electronic only journals with electronic edition of paper journals. The latter, commonly referred to as parallel publishing, is also increasingly common. Prestigious journals such as Nature, Science, and the Proceedings of the National Academy of Sciences are providing electronic edition of the print counterparts, and major publishers such as Elsevier, John Wiley and Sons, and Academic Press are making most of their paper journals available on-line to subscribers. However, these commercial publishers are mostly interested in reproducing traditional publication on a new medium and in generating profit, very few are doing anything truly innovative.

The earliest and best example of a peer-reviewed e-journal sponsored by a learned society is Psycholoquy, an interdisciplinary cognitive science journal funded by the American Psychological Association and edited by cognitive psychologist Stevan Harnad, University of Southampton. Harnad has written extensively on many aspects of e-journal publishing and his papers on interactive publishing are widely read and discussed.

Another good example of a society-based peer-reviewed publication is the Journal of Neuroscience sponsored by the Society for Neuroscience and published jointly with the HighWire Press.

More example of peer-reviewed e-journals can be viewed at the Electronic Journal and Learned Societies Project at Queen's University, Belfast. Funded by the Electronic Libraries Programme, the aim of the project is "to establish a system that will serve as a test bed for learned societies publishing material for the library market as well as for their own members and considering using the electronic journal and facilities offered by electronic networking for the publication of research findings."

The on-line article, A survey of STM online journals 1990-95: the calm before the storm, by Steve Hitchcock, Leslie Carr, and Wendy Hall (Open Journal Project, Multimedia Research Group, University of Southampton) provides a comprehensive sample of current Science, Technology and Medicine e-journals. In addition to providing links to the journals discussed in the article, the authors also discuss the advantages of e-publishing in the Sciences and where e-publishing may be heading. For other views of e-publishing in the Sciences, see "Options for the Future" by Joshua Lederberg, and "Science Journals Go Wired" by Gary Taubes.

You can access these journals directly here: Postmodern Cultures, Internet Archaeology,
Sociological Research Online, and Nordic Linguistic Bulletin.

[14] Bryn Mawr Classical Review

[15] For an alphabetic list of over 90 free web-based scholarly journals, see the directory Scholarly Journals Distributed Via the World-Wide Web, maintained by Charles W. Bailey Jr., University of Houston Libraries.

Readers who want to find out more about the World-Wide Web, the HyperText Transfer Protocol (HTTP), and the HyperText Mark-Up Language (HTML), consult the home page of the World-Wide Web Consortium.


[17] One of the best known example of world-wide collaboration and resource sharing is the Genome Database, an international effort in support of the Human Genome Project, hosted by Johns Hopkins University School of Medicine, Baltimore, Maryland USA.

Amy Friedlander, the editor of D-Lib, recently looked at the potential impact of the Web and digital technology on how we do and present research in "Net Gains for Digital Researchers." Many examples of collaborative projects facilitated by the Web can be found in Friedlander's article.

In "Beyond Browsing: Shared Comments, SOAPs, Trails, and On-line Communities," Martin Röscheisen, Christian Mogensen, and Terry Winograd (Computer Science Department, Stanford University) describe their effort in developing a collaborative system for search. While Marti A. Hearst, researcher at Xerox PARC, discusses "The Changing Social Roles of Documents" in an electronic, collaborative environment.

[18] Many museums and galleries from around the world are now accessible through the WWW, and many institutions also make available special collections for research purposes. To explore the amazing array of museums reachable on the WWW, see the Museums Directory of the Virtual Library Project maintained by Jonathan Bowen, University of Reading.

In addition to conventional museum collections, there are many outstanding digital collections that have been constructed around rare texts and artifacts. The Digital Scriptorium of the Duke
University's Special Collections Library has several on-line archival collections, including Women studies resources and the Duke Papyrus Archive, providing electronic access to images and catalog records of 1373 papyri in Duke's collection.

Other notable collections of rare texts are The Electronic Beowulf Project, which has assembled a huge database of digital images of the Beowulf manuscript and related manuscripts and printed texts; and the Perseus Project, also known as An Evolving Digital Library on Ancient Greece.

[19] Working in conjunction with the Astrophysics Data System(ADS), the American Astronomical Society is building a searchable, permanently accessible archive of bitmap images of the historical astronomical literature, which is linked to the Society's electronic journal, Astrophysical Journal Letters. This is a good example of how an e-journal turns into a networked information resource.

A good example of networked resources in renaissance studies is the web site of the Center for Reformation and Renaissance Studies.

[20] An example of such on-demand publishing is the Public-Access Computer Systems Reviews (PACS Reviews), one of the longest running peer-reviewed e-journal. Articles submitted to the journal are published and archived as soon as they are peer-reviewed and corrected.

For a discussion of the advantages associated with this mode of publishing, see "Web Publishing: Speed Changes Everything," by Steve Hitchcock, Open Journal Project, Multimedia Research Group, Department of Electronics and Computer Science of the University of Southampton.

[21] Rob Kling and Lisa Covi (Department of Information & Computer Science, University of California, Irvine) have written a balanced and informative review of the legitimacy of electronic publications in "Electronic Journals and Legitimate Media in the System of Scholarly Communication." In addition to examining the ways e-journals fit within contemporary scholarly practices, the authors pay particular attention to many scholar's treatment of electronic media as transient and flimsy rather than as a stable medium for "long time truths," and the pragmatics of reading paper and electronic materials. A suggestion made by the authors is that "the most successful electronic journals, in the near term, will need special architecture. They should be designed to be relatively accessible in both paper and electronic formats and circulated in ways that integrate readily with contemporary abstracting and indexing systems as well as with diverse academic libraries."

[22] An informative and entertaining critique of electronic publishing is an essay by Steve Fuller, "CyberPlatonism: An Inadequate Constitution For the Republic of Science." This essay originally appeared in Times Higher Education Supplement Friday May 12, 1995. It is a commentary on Stevan Harnad's essay, "The PostGutenberg Galaxy: How To Get There From Here," in which Harnad reiterates his "subversive proposal" that authors and universities should try to undermine the present publishing system by posting all their publications freely on the Internet. In his debate with Harnad, Fuller expresses grave doubts about Harnad's vision of electronic scholarship.
Fuller's essay also examines the role of media in communication, the structure of the publishing industry, shifting conceptions about the nature of authorship and authorial-credit, and the heterogeneity of materials available on the Internet. Further dialogues between Harnad and Fuller regarding the pros and cons of e-publishing can be accessed through Harnad's homepage.

There is now a very substantial body of literature on various aspects of electronic scholarly publishing. The best means to this literature is through the Network-Based Electronic Publishing of Scholarly Works: A Selective Bibliography (version 25) by Charles W. Bailey, Jr. This bibliography presents selected works, published between 1990 and the present, that are useful in understanding scholarly electronic publishing efforts and related topics, such as archiving, legal, and economic issues. Many of the articles cited in the bibliography are available on-line.

Additional discussion papers can be found in the proceedings of symposia on electronic scholarly publishing sponsored by the Association of Research Libraries (ARL):

- Filling the Pipeline, Paying the Piper -- Proceedings from the Fourth Symposium (1994)


[23] Although peer-review is not a perfect mechanism for assuring quality of published material, it is widely agreed that electronic journals should adopt this well-established system as a means of assuring standard in e-publications. In his paper "Implementing Peer Review on the Net: Scientific Quality Control in Scholarly Electronic Journals", Stevan Harnad describes how peer review is implemented by the e-journal Psycholoquy. In addition to refereed "target articles," Psycholoquy also publishes refereed peer commentary on the articles, as well as author' responses to the commentary. This form of interactive publication, which Harnad dubbed "scholarly skywriting," represents the revolutionary dimension of the Net in scholarly communication. But "skywriting" too, Harnad insists, should be implemented under the constraint of peer review.

Experimentation on improving the peer-review process are now underway. In their paper "Open Peer Review & Argumentation: Loosening the Paper Chains on Journals," Tamara Sumner and Simon Buckingham Shum of the Knowledge Media Institute, The Open University, describe the use of computer-supported collaborative argumentation (CSCA) tools to rethink and redesign the process of scholarly debate at the heart of journal reviewing. Their paper describes the design principles behind this approach, how they are currently being realized in the context of a new journal, Journal of Interactive Media in Education, and discusses some of the issues that this approach raises.

RhetNet, a cyberjournal for rhetoric and writing, recently initiated a discussion on "Peer Review & the Future of Quality in Scholarly Publication" to debate and speculate whether and how peer review is weathering its migration to online publications. Archive of the discussion is available on Rhetnet-L:

http://www.missouri.edu/~rhetnet/peer_review
http://www.missouri.edu/~rhetnet/peer_review2
One of the key questions facing potential e-journal contributors is whether their work will be cited by others in the field. Given that e-journal publishing is still in its infancy and that major indexing services do not yet include many e-journals in their citation indices and abstracts systems, the impact of e-publications at this point is difficult to assess. A recent study by Harter (1996), "The Impact of Electronic Journals on Scholarly Communication: A Citation Analysis," suggests that as measured by citations, and as of today, ejournals haven't made very much impact, with a couple of exceptions. However, Harter was quick to point out that his finding can't be extrapolated even to the near future. The most important reason for the very modest impact so far of ejournals is not the lack of quality of the articles but that until quite recently there have been far too few readers and contributors.

As James S. Gardner, Vice-President (Academic) and Provost of The University of Manitoba, points out in his essay "The Place of Electronic Media Publication in the Evaluation of Faculty Research and Scholarship," (1993): "the publication game and the academic evaluation processes which rely on and legitimate it, are highly conservative in the short term. This conservatism provides some quality assurance but it confounds predictions about the role of electronic media publication in the short term." Gardner suggests that when e-journal becomes more widely accepted as a legitimate channel of scholarly publication, significant changes will occur in how we assess quality and in how we value and evaluate people and their work for purposes of advancement in the university. "Electronic media publication of scholarly work will accentuate and propel an increasing focus on post-publication impact of individual works, groups of works, and programs of research and scholarship in the evaluation of faculty. This will occur in spite of increasingly rigorous pre-publication peer-review processes as applied to electronic media publication."

It is obvious that the question of storage and retrieval as well as the question of impermanence are not specific to the electronic medium. Indeed much printed information has been lost over time. Active conservation and cataloguing effort are needed to keep important material, either in print or digital format, accessible. Many active programmes of cataloguing e-journals and related electronic resources are underway. For example: The member libraries of the Committee on Institutional Cooperation (CIC) are building the CIC Electronic Journals Collection (CIC-EJC), a World-Wide Web resource that will be the largest fully managed collection of electronic journals available on the Internet. Detail description of this project is provided by Bonnie MacEwan and Mira Geffner in "The Committee on Institutional Cooperation Electronic Journals Collection (CIC-EJC): A New Model for Library Management of Scholarly Journals Published on the Internet."

In 1994 the Commission on Preservation and Access (CPA) and The Research Libraries Group (RLG) created a Task Force on Archiving of Digital Information. The Task Force was charged with investigating and recommending means to ensure "continued access indefinitely into the future of records stored in digital electronic form." The task force was composed of individuals drawn from industry, museums, archives and libraries, publishers, scholarly societies and government. The Report of the Task Force on Archiving of Digital Information was recently made available. It should also be pointed out that electronic media are increasingly useful for the conservation of materials originally published on paper. Electronic processes are now routinely used to prepare materials for other media. Distributing and storing digitized documents is actually more effective and easier to monitor than trying to locate hard copy that might get lost or damaged. The electronic
archives of rare texts mentioned in note [18 ] and other innovative projects such as the well known Project Gutenberg, and the Victorian Women Writers Project are good examples of how digital technology can be used to preserve rare materials as well as making literature much more accessible to a broad readership.

[26] In response to the growth and increasing importance of electronic publications, the National Library of Canada (NLC) undertook the Electronic Publications Pilot Project (EPPP) in 1995 to study "how the NLC should interpret and apply its mandate to the context of electronic technologies, and how it can meet the challenges presented by the emergence of electronic publications." Results of the project are available in the National Library of Canada: EPPP Summary of the Final Report, May 7, 1996.

The Canada Institute for Scientific and Technical Information (CISTI) provides a broad range of reference and electronic services as well as serving as publisher for the National Research Council's 14 peer-reviewed research journals. More information can be obtained at the CISTI Home Page.


While it is encouraging to see the Task Force Report urging greater use of electronic publishing and for a re-evaluation of the academic reward system, it should be noted that Canada is in fact behind other countries in development in these areas. In the current Research Assessment Exercise of British Universities, electronic publications are treated on the same basis as those appearing in printed journals, provided they appear in peer reviewed journals. This is the result of adopting the following recommendation in the Follett Report on Libraries: 289.

To help promote the status and acceptability of electronic journals, the Review Group also recommends that the funding councils should make it clear that refereed articles published electronically will be accepted in the next Research Assessment Exercise on the same basis as those appearing in printed journals.

Similar recommendation has not been made by the AUCC-CARL-ABRC Task Force, and the impact of the report by the Task Force remains to be seen.

[28] Intellectual copyright is a highly complex issue, and the ease with which documents can be copied and distributed over the Internet is creating a great deal more confusion regarding copyrights and "fair use." The Stanford University library, in collaboration with the Council on Library Resources, is compiling an electronic archive of information on copyright law in an effort to keep educators and others aware of the ongoing debate over the "fair use" doctrine. The site Copyright Law Archived on the Net contains the full text of court decisions, legislation and
An informative discussion of the possible impact of e-publishing on the ownership and management of content is the essay "Copyright in the New World of Electronic Publishing" (1994) by William Strong.

Note: All signed articles which appear in the CAUT Bulletin and on the CAUT Web Site represent the views of the author and not necessarily those of CAUT. CAUT WebMaster