The nine flavours of open access scholarly publishing

After a print-run of some 340 years, the scholarly journal has now assumed a parallel digital life. What began in 1982, when Bibliographic Information Services issued its first electronic edition of the Harvard Business Review, has become a mass phenomenon. By the turn of the century, 75 percent of academic journals were offering online editions, and more than a 1,000 peer-reviewed journals existed only in digital form.[1][2] While the print editions will continue for some time, the alacrity and thoroughness with which the journal has gone online strongly suggests it has a firm digital future. The immediate, hyperlinked, and globally accessible environment of electronic publishing appears to serve journals and its readers particularly well. It certainly tops the list of research priorities among the patrons of my university, with some 40 percent ranking it ahead of books, print journals, and other resources when it comes to what is most important for their research and scholarship. By contrast, rumors about the death of the book appear to have been exaggerated. The scholarly e-book has yet to find more than a toehold on the Internet, although a number of the classic texts in the Humanities, from Plato to Kant, are freely available online.

Electronic journals offer readers a particular ease of access. They can readily work across different journals, find exactly where certain ideas are being discussed, or move readily from citation to source. They find something that serves their needs, copy the article’s bibliographic reference, and perhaps a quote or two. They press Print, or Save if it’s a keeper, and they move on. Yet digital journal publishing stands poised to do something far more dramatic in promoting the vital circulation of knowledge. Online publishing technologies are capable of reversing what has otherwise been a state of declining access, for faculty and students, to the burgeoning body of serial literature. In every field, open access journals are making research available to a much wider range of readers than print and subscription models have been able to achieve. The success of the open access publishing model is bound to have a profound impact on the state of knowledge, as that state depends on the extent of its circulation and exchange. And there are questions to be raised about that circulation.

As things now stand, the world faces a seeming paradox. In an Age of Information, buoyed by a knowledge economy of global dimensions, the traditional centers of knowledge and information, namely, the universities, are simply unable to keep up with their own production of published research. That is, even the best of the research libraries cannot afford to provide access to it all. The journals have become too expensive, even as there are more and more of them.(A) Decades of subscription price increases for print journals, increases that ran well ahead of inflation rates, have forced university libraries to cut their holdings. These increases can be traced back to a growing corporate concentration in scholarly publishing, especially in the sciences, which has resulted in three companies, Elsevier, Springer, and Taylor and Francis, controlling 60 percent of the journals in the leading citation index, ISI Web of Science.[3][4][5][6] From their perspective, the publisher provides an invaluable, if not an irreplaceable, editorial and publishing. They undoubtedly stepped into the publishing breach, with the tremendous post-World War II growth in research and post-secondary education, to provide a necessarily expanded range of journals that went well beyond what the scholarly societies had chosen to publish.(B) Commercial publishing interests have continued to charge less than the corporate publishers, but not without riding the wave of increasing prices, with many societies turning their journals over to corporate publishers.(E) The impact of these price-increases has affected access to the research literature at universities everywhere. At the high end, the Association of Research Libraries, representing the top 122 research libraries in North America, reports that its members have been forced to cut six percent of their subscriptions since the late 1980s, and that figure was only kept that small by chopping 26 percent off their book budgets during the same period.[6] The cuts to serial titles among less fortunate institutions, especially in developing countries, has been far more drastic and devastating, virtually wiping out their access to the current print literature.

The current migration of journals, online has not, for the most part, changed any of that. While a number of journals briefly experimented...
with free access in the early days of going online, most have ended up simply extending their subscription model to the online environment, further bumping up prices for a new print-plus-online subscription service, with online-only access resulting in minor discounts.\(^F\) At the same time, new forms of site licensing and pay-per-view fees have created additional revenue streams out of yesteryear's journals. Yet I say that nothing has changed, for the most part, because the Internet has also given rise to a radically new, alternative model of distributing research which, at least, has begun to alter the picture of what was otherwise declining access.\(^G\)

That alternative, known as open access, makes the research literature free to read online. For example, a number of disciplines and an increasing number of institutions operate "eprint servers" which enable authors to place their published and unpublished work online in an open access and well-indexed format.\(^[7]\) As well, a number of journals, if only a few in each discipline, are experimenting with offering readers different models of open access (with more details on this below). This has been made possible by, first of all, the development of new online systems that reduce distribution and management costs.\(^[G]\) While it is difficult to identify just how many journals have gone open access, the Directory of Open Access Journals maintained by the University of Lund provides one guide, which within months of it opening was listing hundreds of journal titles, from across the disciplines. Brazil, for example, is moving toward open access for its scientific journal publishing activities virtually as a national policy, through institutional and other grants to its somewhat less than 200 scholarly journals.\(^[8]\)

Now what needs to be made clear is that open access, even among journals, is not following a single economic model. Many people dismiss open access out of hand as clearly having no chance of being economically viable as it has no revenue stream. They fail to appreciate that among the various approaches to open access, there is still a place for subscription and other forms of revenue. To help clarify this situation, I present what I would identify as the nine favours of open access.\(^[11]\)

To briefly describe the nine types, I have already introduced the eprint archive, which often carries on in peaceful co-existence with the journal system, as the policies of the journal enable authors to file their published pieces in open access archives.\(^[H]\) Best known of these is the arXiv.org Eprint Service which began in high energy physics a decade ago and now provides access to a substantial portion of the literature in a number of related areas.\(^[9]\)

In terms of open access journals, the peer-reviewed First Monday, which deals with technical, social and political issues related to the Internet, serves as a good example of a journal that is immediately, completely, and exclusively free-to-read, and as such might be referred to as an unqualified open access journal. Then there is a dual mode open access model which, as in the case of the Journal of Postgraduate Medicine, publishes an immediate and complete edition online of its print version to which it continues to sell subscriptions. What might be thought of as an economically more conservative version of this dual mode is found with delayed open access, exemplified by the New England Journal of Medicine which provides complete free access six months after initial publication for subscribers. The dual and delayed modes might as well be thought of as open access with an undiminished subscription list and revenue stream, though whether the combined print and online publication is a transitional stage or not remains to be seen.

A form of author-fee open access has been developed on a large scale by the leading corporate entry into the open access field, BioMed Central. It offers complete open access to 90-plus journals that are published exclusively online by charging author fees for successful papers. A variation on this model, developed by Thomas J. Walker and in use with the Florida Entomologist and the journals of the Entomological Society of America, is to give the author a choice of paying for open access or leaving it within the fee-based edition.\(^[10]\)

Still another variation in open access is to make a portion of the journal free to read, in what I would call partial open access. Although from a reader's perspective this can be a frustratingly hit and miss system, it still provides access to certain kinds of scholarship to which readers might not otherwise be exposed.

For those hardest hit by increases in the price of the journal, a measure of relief has been established through what I would term per-capita open access. This model includes the World Health Organisation's successful efforts to convince the publishers of medical journals, including Reed Elsevier and others, to make the online versions of these journals free to those living in countries in which per capita incomes are very low. Similar programs have been negotiated by the International Network for the Availability of Scientific Publications. A growing number of publishing portals provide open access abstracts and this is becoming an increasingly popular version of open-access "lite," especially with Reed Elsevier providing access through its Science Direct portal to the e-abstracts of its 1,700 journals. So, in addition to the eprint archive mode of open access, scholarly journals have developed an array of approaches to increasing access to the scholarly journal. Editors, scholarly associations, researchers and scholars have clearly begun to see that such approaches, as they increase the circulation of knowledge, would best serve the larger interests of learning, as well as their own interests.

Finally, one idea that has only begun to take shape is that of forming a co-operative among the principal users of the journals which would support open access journals as a means of managing their access to the research literature, while providing the rest of the world with the benefits of this work. The Association of Research Libraries (ARL) has taken the first step down this path by supporting SPARC and Change programs that have, in turn, assisted journals and supported the development of institutional repositories.\(^[11]\) Yet an open access co-op goes a step farther. The leading libraries would join in underwriting the direct serial expenses of open access journals on a long term basis. One example of co-op open access that has just begun to take shape is the German Academic Publisher's Project, made up largely of university presses and research libraries, dedicated to making open access viable for German academic journals by centralising the development of management and publishing systems and operating through membership.\(^[12]\)

In whatever way it is organised, open access means a gain in the circulation, exchange and advancement of knowledge. And that gain, especially in the case of open access journals, can be dramatic. Consider Gene Glass, for example. This professor of education at Arizona State University, best known perhaps for his development of meta-analysis (which enables the results of statistical studies to be aggregated), established Education Policy Analysis Archives as an unqualified open access journal in 1992. Eleven years later, and after publishing 312 articles (including 24 in Spanish or Portuguese), the journal’s website has some 2,500 visitors per weekday. As academic journals go, that is a considerable readership, especially as it represents visitors from 75-80 nations and, according to a survey of readers Glass conducted, includes teachers (16 percent), parents (three percent) and a small number of journalists (one percent). The journal's two most popular articles - one on home schooling and the other on teacher characteristics and achievement - have had well over 50,000 hits each, with the rate still increasing years after publication, again bucking the typical academic pattern. Glass runs the journal out of his office, on an old computer that acts as a web-server, with no budget for publishing, apart from the time he devotes to editing it. Open access is changing the public and scholarly presence of the research article, and that increased presence is arguably good for the state of knowledge and the support that it receives from the larger society.

Now, the assumption here is not information is, or somehow wants to be, free. Anything but. Open access begins with the fact that researchers are engaged in expensive, labour-intensive work that often employs highly sophisticated equipment, fully equipped and staffed laboratories. Researchers fly to distant archives and remote sites; they hire teams of graduate student research assistants; they devote years to studying a single body of work. Much of this work is undertaken by public institutions, government grants, and philanthropic endowments. The very extent of this largely public investment is what sets scholarly publishing apart from the more typical commercial model. The work represented in a research article has all been paid for in advance. The article arrives at the publisher's door, having already been financed, up to that point, as a public good. The public does not expect to be repaid for this research investment, at least not through its publication.

The publisher not only does not have to pay its authors, the services of highly qualified editors and reviewers are donated, as well (with
Publishers do cover the production cost of copyediting, layout, proofreading, printing, binding, mailing, and promotion; they are now putting up well-engineered websites for electronic editions of their journals. They bring management skills, as well as care and quality, to the journal's production. During the age of print, the finely produced journal, with a circulation that could run as low as 200-400 copies, required this mix of public and private investment. The high quality of paper, printing, and binding were not so much a luxury as a necessity to the archival quality of the journal preserving it for use by generations of scholars. So things might have happily continued, had not the corporate interests within this limited, subsidised economy pushed journal subscription prices to the point where access to the knowledge went into a state of decline, at a time when new publishing technologies enabled researchers to take publishing back into their own hands. These new technologies have been used to demonstrate how access can be greatly increased, improving the circulation of knowledge, restoring the researcher's control of knowledge, and extending its value as a public good by making it far more widely available.

Now, it is certainly true that open access depends on the reader's ability to find a computer connected to the Internet, which is still a significant barrier in many institutions of higher learning in the developing world. Yet faculty members and students have much greater hope of accessing the wider body of research literature online, if only through an Internet café, thanks to open access, than they do through the dwindling supply of current print journals. We need to understand that the gains in access to knowledge are, at best, incremental, and are not to be judged against some unachievable ideal of universal access or complete equity of access.

In this current knowledge economy, the Internet appears to be, through various models of open access publishing, to do more to extend the circulation of knowledge, and to increase participation in a global exchange around that knowledge, than print has been able to achieve. Open access provides scholarly resources to a vast number of faculty and students who conduct their studies outside of the privileged circle of the leading institutions. It opens a new world of learning to dedicated professionals and interested amateurs, to concerned journalists and policymakers. These incremental gains in access do not, however, simply follow from our ready embrace of new technologies. Such gains are only achieved through the commitment of scholars everywhere to finding new ways of improving access to knowledge. Although the goal is the same, there is more than one path forward, more than one way of opening access.

Notes
A. A recent Association of Learned and Professional Society Publishers survey of publishers found that among 149 publishers, 783 new journals titles were launched between 1998-2003.[14]

B. Elsevier, for example, has in recent years acquired the publishers, Harcourt, Academic, and Pergamon. See McCabe reports on mergers and monopolies among corporate academic publishers: “According to these empirical estimates, each of these mergers was associated with substantial price increases; in the case of the Elsevier deal the price increase appears to be due to increased market power. For example, compared to premerger prices, the Elsevier deal resulted in an average price increase of 22% for former Pergamon titles, and an 8% increase for Elsevier deal titles.”[15][16] Also see Tamber.[17]

C. The growth of basic and applied funding in the United States, for example, grew from $6 billion to $17 billion from 1960 to 1990 (in constant 1982 dollars), after a very rapid doubling in the first five years after 1960 (NSF 1990). Enrollment in higher education has grown on a worldwide basis from 51 million in 1980 to 82 million in 1995.[18]

D. Elsevier's own online journal archive, Science Direct, is proving to be one of the more successful e-business ventures. The parent company Reed Elsevier, fifth largest media company in the world, had revenues of $8 billion in 2002, of which $1.5 billion comes from online subscriptions. The economist Roger G. Noll also observes the larger social cost of these increases: “In addition, the high institutional price causes institutional libraries to be far smaller than would be socially optimal. Of course, for publications in science and engineering, this inefficiency ripples throughout the entire economy, for it means that education, applied research and development, and direct diffusion to the production of goods and services will proceed at a slower rate than otherwise would be the case.”[21]

F. For example, the American Chemical Society states on its website, under the title ACS All-electronic Pricing for institutional subscriptions: “We are pleased to offer all-electronic access to ACS Web Editions. The electronic access fee is calculated by taking 100% of the print expenditure. Print copies are added at 15% of the listed print price. Please contact your ACS Account Manager for a quote.” For members of the ACS, on the other hand, Organic Letters is $25 online and $203 in print.

G. For example, and in the interest of full disclosure, the Public Knowledge Project at the University of British Columbia, with which I work, has developed Open Journal Systems, an open source journal management and publishing system available at its website (http://www.arl.org/newsltr/204/spending.html). E. Among the economic factors at work on the journal, the very reductions in journal subscribers, caused by price increases, have led to further increases for the remaining subscribers forced to generate the same revenue levels to produce the journal, in something of a vicious circle of declining access.[20] McCabe estimates for example that a 1% increase in price in 1999 resulted in a 0.3% drop in subscriptions. The economist Roger G. Noll also observes the larger social cost of these increases: “In addition, the high institutional price causes institutional libraries to be far smaller than would be socially optimal. Of course, for publications in science and engineering, this inefficiency ripples throughout the entire economy, for it means that education, applied research and development, and direct diffusion to the production of goods and services will proceed at a slower rate than otherwise would be the case.”[21]

H. On whether an author's copyright agreement with a journal permits open access self-archiving, see Project RoMEO (http://www.iboro.ac.uk/departments/dis/disresearch/romeo); Elizabeth Gadd, Charles Oppenheim, and Steve Probsels report that a little bit less than half the journals in their study permit both preprint and postprint self-archiving, with a third allowing post-print and 20 percent specifying preprint only.[22]

References


