A Question of Access:
SPARC, BioOne and Society-driven Electronic Publishing

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In the pre-millennial fervor of late 1999, Gutenberg and his invention, the printing press, topped nearly every list of pioneers and projects that changed the course of history. Aside from technological innovation, Gutenberg is remembered because he gave people the gift of access to others' ideas and the vehicle to disseminate their own. Once literacy shifted from the monastery to the mainstream, the world of ideas opened up to an audience that has always wanted to learn as much as it could as fast as it could.

But Gutenberg's gift is now under siege, and nowhere is this truer than in scholarly communication. At a time when the Internet has created opportunities for free and wide communication of research with potentially broad societal benefit, scholarship is increasingly regarded as an article of commerce to be guarded and parceled out for maximum financial return.

The world of journal publishing—a key means of communicating advances for scientists in particular—is a useful vehicle for examining the dilemma facing scholarly communication today. As popular acceptance of web publishing has grown, opportunities to reengineer the value chain between author and reader (who ironically are often one and the same) have become apparent. Societies, academic institutions, commercial organizations, and government agencies are jockeying to claim their place in a transformed scholarly communication system. To survive, each institution must re-discover its role in offering the community of scientists and scholars a better way to do their job and attain recognition.

This discussion focuses on the outlook for scientific societies in this re-engineered system. Societies are critical because of their traditional central relationship to the all-important source of supply: the author.

How We Got Here

For nearly 300 years—since 1665, when the Royal Society of London published the first modern journal, *Philosophical Transactions*—societies satisfied the need for scholars to communicate among themselves and so maintained their role as the principal scholarly publishers. Research articles were "gifted" to societies by authors and returned to the community in low-cost journals. But the economic foundation for scholarly communication began a profound shift after World War II. Research funding expanded greatly, and with it, the volume of research to be published exploded.

Commercial firms found there was money to be made publishing the overflow of articles that couldn't be accommodated in society journals. Many scholars in need of promotion and tenure were only too happy to be published in these commercial journals—especially when the alternative was not being published at all—and gave their research papers away to journals for free. It didn't take long for commercial publishers to discover that demand for journals was remarkably inelastic. And since they were incentivised to maximize profit, they did the rational thing—they raised institutional

prices of journals dramatically and relentlessly to exploit the elasticity curve. Institutional subscribers, accounting for the lion's share of the revenue supporting publication of journals in most fields, paid the price because their users demanded access.

With this foot in the door, commercial publishers built substantial portfolios of journals, aided by a trend of society "outsourcing" of their journal publishing to commercial firms. The high corporate profits from these journals have funded aggressive programs of internal development and wave upon wave of acquisitions and consolidation among publishers.

As society publishing increasingly gave way to commercial publishing, the cost of scholarly journals, especially those in the science, technology and medical (STM) fields, skyrocketed—limiting access to research and threatening to diminish scientific progress. Members of North America's Association of Research Libraries (ARL), for example, subscribed to six percent fewer journals in 1999 than they did in 1986—but they were spending 170 percent more to subscribe.[1]

The emergent economic model replaced the traditional "circle of gifts" between scholars and their societies not with a real market economy, but with a dysfunctional hybrid. In effect, commercial scholarly publishing has placed for-profit incentives on the publishing portion of a process that doesn't enable consumers to exert any pressure on price. By the final decade of the millennium, scholarly publishing appeared to be on the road to collapse.

At the Crossroads

The advent of the Internet offers the potential to revitalize scholarly publishing as it breaks down old patterns of communication. Most scholarly communication stakeholders have begun to recognize that the path forward is not through continued price increases on existing journals, but through development of new economic models, new markets, new products, new value added services, and new enhancements to productivity. To achieve this requires that stakeholders develop new, dynamic relationships among themselves.

One attractive strategy is for societies to reassert their leadership, leveraging the key factors that differentiate them from commercial publishers and retake the initiative. The fact that the society—not the commercial publisher—is the focal point of a community is a key differentiating factor and advantage. Societies' non-profit orientation is a value that should be emphasized in this context.

Important roles also exist for academic institutions, university presses, government agencies, and other non-profit institutions. However, a case can be made that the scholarly communication system must be built around communities of scholars. While the Internet offers a tool for anyone to convene a virtual community, societies are the strongest and most enduring embodiment of the participants' common interest.

But if societies are to challenge the growing power of commercial publishers, they must have a means of answering the commercial publishers' advantage in access to capital. Hence, societies must look to partner with organizations that share their core values. In such a scenario, money that libraries are already spending on journals from commercial and other sources might be re-deployed in ways that better serve them—ways

[1]ARL Statistics, 1997-98, Washington, DC, Association of Research Libraries, 1999, p. 9.

that strengthen the non-profit scholarly publishing sector as a competitive alternative to commercial publishing of scholarship.

Some have challenged the efficacy of this strategy, citing examples of societies imitating commercial publishers' pricing strategies. A few societies have found such practices irresistible, rationalizing that it is necessary if they are to compete and build a future. But, on the whole, a growing body of data demonstrates that society journals do offer a far better value than commercial titles. For example, a study released in the summer of 1999 by the University of Wisconsin shows that in terms of average price, cost per thousand characters, and cost/impact ratio non-profit journals in physics, economics, and neuroscience are far more cost effective than commercial titles.[2] A Cornell University study released in November 1998 had similar findings in the area of agriculture.[3]

Strategic Challenge

"Scholarship" is a term that refers to many different and independent endeavors that are unified, not as single system, but by broad common goals and interests. Likewise scholarly communication takes place within many different and sometimes overlapping channels, not as a unified process.

Because of this fragmentation, the battle for control of scholarly communication will be waged on many fronts. Indeed, a scramble by commercial publishers to gain Web "channel dominance" in key fields has begun. In tomorrow's wired world, control of a critical mass of content will allow the owner to dictate terms and effectively "own" the user. After all, if there are ten relevant Web portals available to a user, and one of these offers access to 75 percent of the information in the field, that one will garner usage, profit, and brand identity. Few users will even bother to check the other sites. Unfortunately, reference linking protocols that permit users to navigate across sites don't necessarily solve the problem—not when pricing and licensing barriers present a locked door.

Given the distinct benefits of channel dominance, it's no surprise that the stampede by commercial publishers to take over society journals and acquire competing commercial publishers has accelerated. These journals provide access to authors. In many fields they publish the leading journals, the prestigious content needed to assure channel dominance. And they provide publishers an expedient means to fill gaps in their established list and to grab a share of important new sectors.

If this trend is left unanswered, it positions commercial publishers not just to prosper but to rule in the Internet Age. If the impact on scholarly communications of commercial publishers over the past several decades is any guide, the impact on scholarship and academe could be devastating.

Fortunately, this doesn't have to be. An historic opportunity and distinct strategic benefits are available to many societies if they rise to the challenge. In most fields, societies' journals are the traditional publications of choice—the "must-have" content. Societies are consequently in a position to control, rather than to be the victim of, the changes taking place in publishing.

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[2] "Measuring the Cost Effectiveness of Journals: The Wisconsin Experience," ARL Bimonthly Report, 205 (August 1999), pp. 1-6. Also available at <http://www.library.wisc.edu/projects/glsdo/cost.html.>

[3] "Journal Price Study of Core Agricultural and Biological Journals," Faculty Taskforce, College of Agriculture and Life Sciences, Division of Biological Sciences, Albert R. Mann Library, Cornell University, November 1998.

Partnering for Change

SPARC—the Scholarly Publishing and Academic Resources Coalition—is one vehicle through which libraries and research institutions channel their support for change in scholarly communication. In 1998, after years of mounting frustration with high and fast-rising commercial journal prices, a group of libraries formally launched SPARC to promote competition in the scholarly publishing marketplace. The idea was to use libraries' buying power to nurture the creation of high-quality, low-priced publication outlets for peer-reviewed scientific, technical, and medical research. Through library subscriptions to SPARC partner journals, SPARC reduces the risk to publisher-partners inherent when entering the online marketplace. SPARC also provides scientists with prestigious and responsive alternatives to commercial publishing vehicles. SPARC helps its partners enter the market at lower cost by generating support for SPARC projects through its broad public communications and marketing programs and providing advisory services that help ensure an attractive market offering.

SPARC-endorsed publications from university presses, independent publishing initiatives, and societies give libraries and scientists choices that allow them to decide where their limited funds are best spent. SPARC's 180 member libraries pledge support for SPARC publisher-partners, helping their top-quality print and electronic journals achieve viability from the start.

BioOne, one of SPARC's partners, illustrates the possibility of forging new mechanisms for collaboration among societies and academic institutions to assert leadership on a broader scale. An electronic aggregation of bioscience journals from dozens of small societies, BioOne is a bold initiative that assures scientific communication remains responsive to the needs of scientists and societies. Now in development, BioOne will aggregate, link and make easily accessible peer-reviewed research in the biological, ecological and environmental sciences. It enables leading non-profit journals self-published by scientific societies to remain viable, and offers them a cost-effective alternative to commercial publishers' digital aggregations. It also provides a shared technological, experiential and collaborative platform for future development benefiting the participants.

The BioOne Approach

BioOne was established as a non-profit corporation governed by a board of directors representing academic institutions, library consortia, societies, and the private sector. By bringing to the Web a uniquely valuable aggregation of the full texts of high-impact bioscience research journals, BioOne helps societies ensure their own future vitality. With BioOne, societies enable users to navigate seamlessly among journals from different societies, assured that the price of access is motivated by goals of cost recovery and maximization of dissemination.

BioOne is remarkable for the assemblage of stakeholders who have come together to make it a reality. The initiative to create BioOne was announced in June 1999, and at the start the collaboration was almost the biggest news of all. BioOne was created by organizations representing key aspects of the scholarly communications process: scientific societies, libraries, and the commercial sector.

At the heart of the collaboration is the belief that high-impact, low-cost alternatives to commercially published research can play a continuing and expanding role in science—and can be key forces in rejuvenating scientific communications.

Each of the BioOne founding collaborators has experience that benefits the undertaking:

- American Institute of Biological Sciences (AIBS), publisher of the journal *BioScience*, is a federation of scientific societies that facilitates the exchange and dissemination of research among its members and with the public at large. AIBS advocates for the interests of its member societies participating in BioOne.
- SPARC is a coalition of libraries that promotes and facilitates expanded competition in the scientific journals market. It has marshaled the financial support of its members for BioOne and brings to bear the product development and market experience of its staff.
- The Big 12 Plus Libraries Consortium represents 23 major research libraries with common objectives related to scholarly communications. It plays a lead role in data licensing issues and has garnered the support of provosts at its member institutions.
- The University of Kansas is a major comprehensive research and teaching university committed to research as a means of mutually reinforcing the scholarly inquiry underlying and informing the educational experience. It leads BioOne's technology development effort.
- Allen Press is a leading provider of publishing production services to societies that self-publish their journals. Allen Press will leverage its substantial skill in data fabrication and its familiarity with delivering full text files via the Internet for many of BioOne's participating journals.

BioOne's technology solutions will be implemented through several means, with plans and progress guided by a Technology Advisory Committee, including representatives from the library and society arenas. Under arms-length service agreements, Allen Press is serving as production/programming center and database fabricator and the University of Kansas as Web site host. Mirror sites will be established at strategic locations internationally.

Libraries Shaping the Market

As any scholarly publisher can attest, launching a new publication today is a risky proposition. The biggest challenge may be attracting authors and readers. Since BioOne is an aggregation of journals that already exist, cultivating authors is not an issue. Cultivating subscribers is. From its first glimmer, though, BioOne was conceived as a partnership with libraries and library consortia, utilizing their input and needs to create the most useful, beneficial product available.

In fact, in a unique arrangement, SPARC and Big 12 Plus Libraries Consortium member libraries provided seed money for BioOne's development. In exchange for their development capital, libraries' funds will be rebated to them in the form of BioOne subscription credits returned over a five-year period following launch. This kind of collaboration with small societies enables libraries to ensure the future of reasonably priced, high-quality research—and stimulates a more competitive publishing

environment. Libraries have long been stakeholders in the communications process, but with BioOne they are akin to "stockholders" as well.

A key strategy for keeping prices low will be broad dissemination of BioOne. Thus BioOne will be "born consortial." A progressive pricing model and targeted marketing strategy will assure that society journals achieve dramatically expanded dissemination and use. To achieve this, BioOne has moved early in its development to forge a North American marketing partnership with Amigos Library Services, a nonprofit organization dedicated to providing resource-sharing opportunities and information technology to libraries. Similar objectives are being sought in separate international marketing arrangements.

Benefits to Societies

Societies participating in BioOne have an unparalleled opportunity to stand in the vanguard of electronic publishing. In exchange for their collaboration, they receive a range of important financial and strategic benefits in a package unmatched by any other comparable database aggregator.

Near-term financial benefits include a share of BioOne revenues, protection against accelerated erosion of print subscriptions, no out-of-pocket costs for start-up and continuing text conversion and coding, and minimal if any impact on operations and infrastructure in the transition to becoming an electronic publisher.

Strategic benefits for societies include:

- access to the worldwide market for scientific communications, reaching new customers and users otherwise likely unreachable through unilateral, self-funded society efforts
- preservation of electronic full text journal content for future generations of researchers
- participation and visibility in a top Internet "destination site" for bioscience researchers and the number one access channel to journals in organismal and integrative biology
- extension of a society's identity and mission to a broader audience
- flexibility in how society may pursue other electronic publishing opportunities
- future options for enhancement of membership services and benefits via BioOne's and society's expanded Web-based information community.

Readers benefit, too. BioOne utilizes hyperlinking of its core content, making each journal in the database aggregation part of a unique, interrelated electronic collection of top bioscience research information. Reference linking between articles in different issues and journals provides utility to researchers by unifying previously disparate information resources.

Access, Revisited

Right now societies have a window of opportunity for action that will assure their viability, vibrancy, and continuing role in the research value chain. But in many fields, the financial strength of commercial competitors can only be addressed if societies act collectively across adjacent societies or in partnership with other kinds of scholarly communications stakeholders.

BioOne is one model of how this might be achieved, one that can be replicated in other fields. The hope is not just that BioOne succeeds, but that BioOne's success inspires similar innovations in scientific communications across disciplines and fields.

Libraries have already responded with overwhelming enthusiasm and concrete support for BioOne. Many who have backed BioOne point to its goal of ensuring the viability of smaller scientific societies who have been offering good value on their journals for years. For the collaborators, that's a motivating factor. The plight of the small society has an effect on scientific research even at the topmost rungs. If these journals can't make the jump to electronic dissemination, they will ultimately get squeezed out of publishing and perhaps out of existence. When they do make the jump, via BioOne, they will contribute to and advance the scientific process. Libraries will receive reasonably priced access to research for millions of subscribers and researchers will have access to publishing vehicles that embody their own ethos toward science.

If it sounds like BioOne is trying to please everyone involved in the scholarly communications process—it is. The founding participants in the project believe that the opportunity for wide and cost-effective access to research offered by the Internet can be achieved through collaboration. Societies and libraries each play a critical role in the scholarly communication system, and with BioOne the two are united under the banner of broad access to science. Gutenberg would be proud.