Electronic Publication of Legal Scholarship: New Issues and New Models

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In the United States the primary form for scholarly communication in law has long been the law review article, published in a journal housed at one of the nation's law schools. In contrast to other disciplines, there are few commercial or society-based scholarly journals in law, and few peer-edited legal journals. Nearly all law reviews, whether general in coverage or subject specific, are student run and edited. There are a lot of them, and their subscription costs are significantly less than for journals in other disciplines. In addition to their role in disseminating legal scholarship, law reviews serve as educational, credentialing, and social activities for students, and as branding vehicles for their schools. Because the journals serve multiple roles, U.S. law schools have traditionally underwritten their costs of operation, keeping subscription prices low. As a result, the journals of all law schools are readily available in law libraries throughout the country.

Despite the benefits of low cost and easy accessibility to legal scholarship, faculty criticisms of the law review system date back at least to a frequently

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For comments about the number (and size) of journals in law and comparisons with other fields, see Lawrence M. Friedman, Law Reviews and Legal Scholarship: Some Comments, 75 Denv. U. L. Rev. 661, 662–63 (1998) ("[N]o other field has so many journals. There are a lot more academic psychologists and economists than there are law professors; but many fewer journals."); Richard S. Harnsberger, Reflections About Law Reviews and American Legal Scholarship, 76 Neb. L. Rev. 681, 683–84 (1997); Bernard J. Hibbitts, Last Writes? Reassessing the Law Review in the Age of Cyberspace, 71 N.Y.U. L. Rev. 615, 638–40 (1996).

2. A December 2001 review of Duke Law Library's acquisitions records indicated that the library pays an average of about $47 annually per subscription to journals listing affiliations with U.S. law schools.

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cited 1936 article by Yale law professor Fred Rodell, and extend forward to the more recent comprehensive treatments by Bernard Hibbitts and others. Hibbitts's work catalogs the range of current faculty criticisms, most of which focus on student editorial control of the primary means of publication for faculty scholarship. Among other things, faculty critics cite problems with student editors' selection processes and criteria, their editing skills, and the lengthy delays before articles are accepted for publication and again before accepted articles appear in print. As Hibbitts notes, the long-standing shortcomings of the law review system have become magnified for law faculty with the imposition of more stringent requirements for law teachers to produce and publish scholarship in order to gain tenure and promotion.

Legal scholarship is not immune from the impacts of the Internet and the new environment it provides for research and communication. In law, as in other fields of scholarship, seekers and users of information have ready access to networked computers and to applications that allow them to communicate easily with colleagues around the world, and to retrieve and share the information they need to be productive directly at their desks.

In other disciplines, particularly in the sciences, these new possibilities have led to disruptions in traditional patterns of scholarly communication and changes in the ways that research results are published, communicated, and preserved. What effects will new technologies have on scholarly communica-


5. See Hibbitts, supra note 1, at 628–54. For student editors' comments on positive aspects of the student editing system, see Saunders, supra note 4, at 1670–73; Harper, supra note 4, at 1271–82.


tion in law? Will legal scholars gain more than the capability to locate and print material for later reading without having to visit the law library or engage the services of a research assistant or secretary? This article looks at communication patterns in law and in other fields in order to weigh the possible impacts of developments in other disciplines on the traditional systems for publication of legal scholarship in the U.S.

Scholarly Communication in Other Disciplines

The idea of scholarly communication is based in the continuing needs of researchers and scholars to share with others the results of their research and the new knowledge they have created. The essence of the concept is found in a statement by Stevan Harnad: "[C]reating new knowledge is not enough; even to serve as an open-ended investment, knowledge must be communicated, ultimately to the next generation, but in the first instance to one’s fellow-researchers, to one’s peers, so they can apply, test, and build upon it." Although he notes both key elements in scholarly communication, dissemination of new knowledge upon its creation and preservation of knowledge for use in the future, Harnad’s emphasis is on dissemination—communication in the first instance. With the development of new electronic means for quick dissemination of information, there is more tension between dissemination and preservation than in the past, when the means of dissemination were grounded in print media. In a print environment journals and monographs served not only as primary means for dissemination of knowledge, but as artifacts that could be preserved (though not without effort) by libraries and others. Because of the Internet’s powerful and immediate impacts on how scholars communicate, there has been less attention paid to solving the problems of preserving scholarship published in electronic media than to the advantages those media provide for disseminating it.

Some writers discuss scholarly communication within a historical context broad enough to include the first conferences and other efforts to share scholarly information at Oxford in the seventeenth century. Others emphasize the more recent impacts of information technology on the processes of scholarly research and on scholars’ ability to communicate and share informa-


9. It has been suggested that the use of the term digital objects to describe the born-digital equivalents of these artifacts “betrays a nostalgia for the heft and smell and texture of glue and paper and ink.” Matthew Battles. Lost in the Stacks: The Decline and Fall of the Universal Library, Harper’s Mag., Jan. 2000, at 36, 38.

Robert C. Berring, a prominent law librarian, has commented: “When I hold a disintegrating volume in my hand I always think of folks who make much of whether electronic information will last. One of the sad failures of librarianship has been the inability to develop reasonably priced means of preserving books.” Legal Information and the Search for Cognitive Authority, 88 Cal. L. Rev. 1673, 1684 n.29 (2000). See also Kevin M. Guthrie, Archiving in the Digital Age, EDUCAUSE Rev., Nov./Dec. 2001, at 57, 58.

tion easily and quickly. For librarian Peter Lyman, scholarly communication is a term "invented to frame both print publication and digital communication within a single functional schema" in an environment where information technology both changes the processes of research and creates new kinds of information products and services that were not available in a print environment.¹¹

Scholars and researchers use a variety of means to disseminate research results and communicate with others in their own or related fields, and they think of scholarly communication in terms that go beyond library-centered research. All scholarly disciplines employ both formal forms of publication and dissemination of research results (monographs, journal articles, presentation of papers at conferences, etc.) and less formal communications (letters, conversations at meetings, telephone conversations, e-mail, circulation of draft papers, etc.).¹² Disciplines differ in the extent to which they rely on any of these mechanisms, but, for active researchers in any field, there is much more to scholarly communication than the formal publications traditionally found in libraries.

In considering the present and future roles of informal forms of scholarly communication, it is important to note that the common digital formats of both formal and informal communications are increasingly blurring many of the previous distinctions between them. Not only the final, definitive versions of papers (reviewed and accepted for publication), but earlier versions (original and revised after presentation and comment) and comments on those versions (in e-mail messages and other "born-digital" communications), can be "published" and disseminated through the same digital media. As a result, much current discussion in disciplines outside law focuses on the entire range of communications employed by researchers within the discourse communities of their disciplines. Evolving definitions of digital libraries take into consideration that many less formal (and previously inaccessible) forms of information are now disseminated in digital formats that make them widely available and could allow them to persist, even without planned preservation efforts.¹³ For those concerned about organizing and preserving scholarly literature, and making it accessible, these changes raise issues of version control, persistence of access, and preservation that were of significantly less concern when formal publication required a print format.


¹³. For historical antecedents, see Kronick, supra note 10. As an example, see Louis Menand, The Metaphysical Club 124–25 (New York, 2001) (Although Darwin "discovered" the law of natural selection in 1838," he did not publish On the Origin of Species until 1859. But, throughout the twenty year period, "he was in continual correspondence with scientists all over Europe and the United States. Everyone knew what he was working on.").

The general history of the current system for publication and dissemination of scholarly information is well documented. Recent history, at least for the sciences, focuses on the rising costs of scholarly journals.14

From the publication of the first modern scholarly journal in 1665 until the latter half of the twentieth century, scholarly societies served as the primary publishers of scholarly information in most fields and provided most of the other support needed for scholars to communicate with others involved in similar pursuits.15 Commercial publishers had little interest in journal publication because of the likely unprofitability of journals in comparison to treatises and manuals. The situation changed after the Second World War, in part because of pressures from scholars and researchers, who grew restive with delays in publishing new research results and with other shortcomings of the society-based scholarly communications process.16 More important, as funding for research increased, especially in science, technology, and medicine, the volume of specialized research reports and articles increased to a point where commercially published journals began to supplement or supplant society journals as primary publishers of scholarly information. Eventually the commercial publishers, realizing that demand for the journals was basically inelastic, were able to raise prices and maximize profits from a captive audience consisting largely of research libraries.17 This created what is usually considered to be a crisis situation for libraries supporting research in science, technology, and medicine (often described collectively as the STM disciplines).18

Although this is not the environment in which U.S. legal scholarship is published, it is important to understand it in order to understand the impacts of technology on the publication and dissemination of legal scholarship in the future.


17. Guédon argues that the introduction of the Science Citation Index in 1961 enhanced the abilities of commercial journal publishers to identify the core journals in each field and to concentrate their efforts on those journals. Guédon, supra note 14, at 20–22. Once there was a means to identify which journals were essential for libraries to hold, the elements for inelastic pricing were in place.

For an application of the core journals concept to legal journals, see Fred R. Shapiro, The Most-Cited Law Reviews, 29 J. Legal Stud. 389 (2000).

18. The financial crisis for STM research libraries is based both in high per-title subscription costs and in a proliferation of highly specialized journals with small readerships. One list of the 99 highest-priced STM journals shows a range of annual subscription costs from just over $3,000 to more than $16,000 (for the journal Brain Research, published by Elsevier). Ninety-one of the journals listed are published by one of five commercial publishers; 65, by one publisher (Elsevier). See High-Priced Journals, at <http://db.arl.org/journals/> (last visited Sept. 25, 2002). For a comparison of periodical prices by discipline, see Kathleen Born & Lee Van Orsdel, Periodical Price Survey 2001: Searching for Serials Utopia, Libr. J., Apr. 15, 2001, at 53.
Impacts of Electronic Publishing and the Internet on Scholarly Communication

Electronic Journals

Scholarly communications systems must

- provide quality certification for new works through such devices as peer review, formal acceptance for publication, and editing.
- enable distribution and access to new works.
- provide a basis for organizing and indexing the literature of the field.
- support archiving and preservation of the literature.

In a pure print environment the forms of communication among scholars and for dissemination of research results are more limited than in a digital environment. Scholarly journals are common in all disciplines, and wide dissemination of new scholarship is generally closely tied to formal publication, usually in a print or (more recently) a print/electronic journal. Yet the relative importance of the journal's role in performing the services noted above (or others) can vary by discipline. The importance of the journal's role in disseminating reports of new research may be quite different in physics than in other sciences, and different still in a nonscientific field like law.

Because the journal form is common, however, most initial attempts to apply information technology in scholarly communication focused on developing electronic versions of existing publications. Most commercial (and some university and society) publishers in all areas of research have pursued electronic publication initiatives. Although at first subscribers were usually required to maintain subscriptions to their print copies in order to have access to electronic versions of existing journals, some publishers have begun making electronic-only package subscriptions available. Some publishers offer e-mail notifications when new issues are published. Others provide prepublication access to papers scheduled for publication in future issues.


22. Wiley InterScience <http://www3.interscience.wiley.com>, the online journals service of John Wiley & Sons, Inc., offers prepublication Web access to articles for such journals as the Journal of the American Society for Information Science and Technology.
In addition to the initiatives of commercial publishers, there have been other notable electronic publishing efforts, some spearheaded by libraries or library organizations, occasionally with foundation support. Prominent examples of noncommercial activities of this sort include Highwire Press, an initiative of the Stanford University Libraries (<http://highwire.stanford.edu/>), which works with societies and other journal publishers (primarily in the sciences, technology, and medicine) to support noncommercial publication of electronic versions of print journals,23 and Project Muse at John Hopkins University (<http://muse.jhu.edu/>), which provides electronic versions of more than 100 journal titles in the humanities and social sciences from its own university press and other scholarly presses.

Some initiatives have focused on supporting new journal alternatives to costly existing print or print/electronic journals in the STM area. The Association of Research Libraries (ARL) sponsors SPARC (the Scholarly Publishing and Academic Resources Coalition) (<http://www.arl.org/sparc/>), a program aimed at working with publishers interested in developing high-quality lower-priced alternative journals in the sciences.24 BioMed Central (<http://www.biomedcentral.com/>), a commercial service, publishes freely accessible peer-reviewed all-electronic journals in medicine and biology, and makes its publishing infrastructure available to groups of researchers who wish to publish journals for their research communities.25

Other efforts have focused on providing electronic access to retrospective runs of primary journals in important fields of research. JSTOR (for "journal storage," <http://www.jstor.org/>) is a project of the Andrew W. Mellon Foundation designed to provide online access to full runs of core journals in a number of largely nonscientific fields. JSTOR provides bit-mapped page images of complete runs of its journals, usually extending to within a few years of the current volume. In addition to providing replications of a journal’s pages, JSTOR includes searchable databases of its content.26

To the extent that these and other initiatives in electronic publishing have (initially, at least) concentrated on replicating the journal form, they have

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23. To the information in the printed versions of the journals, Highwire electronic journals add links among authors, articles, and citations; advanced search capabilities; images; multimedia; and interactivity.

24. SPARC’s (and ARL’s) approaches to improving scholarly communication in the sciences have broadened beyond support of alternative journals to include participation in such activities as the Budapest Open Archives Initiative. See Press Release, SPARC and SPARC Europe Support Budapest Open Access Initiative, available at <http://www.arl.org/sparc/core/index.asp?page=52> (Feb. 14, 2002). SPARC’s own Scientific Communities program looks beyond the journal form to support the development of “portals” and other electronic means for aggregating peer-reviewed research and other content to meet the needs of discrete scientific communities.

25. Publication in a BioMed Central journal was initially without charge to authors. Beginning in 2002, authors pay processing charges of $500 per accepted article, with individual fees waived for authors whose institutions have paid an annual membership fee to BioMed Central. See Press Release, Open access to research to be funded by BioMed Central’s new Institutional Membership Program, available at <http://www.biomedcentral.com/info/pr-releases.asp?pr=20011220> (Dec. 20, 2001).

26. JSTOR includes few law-related journals. The William S. Hein Company provides significant access to runs of law journals through a similar product, at <http://heinonline.org/>.
been criticized for not taking full advantage of the potential of the new media to address all of the concerns of the creators and users of scholarly information. Even ARL's SPARC project, which has been widely praised for its efforts to create alternatives to the high-cost commercial STM journals, has been criticized for being wedded to existing scholarly communication systems, rather than breaking new ground that might improve access and better meet the needs of scholars. JSTOR, too, has been praised for its successes in providing searchable digital archives of core scholarly journals, but it can also be seen as an expensive program in retrospective digital publishing, without clear implications for the prospective publication of scholarly information in electronic forms. In the views of some, these initiatives are aimed less at meeting the concerns of scholars and researchers than at maintaining the forms and institutions of print-era scholarly communication and solving the problems of libraries and publishers.

Open Archiving

Groups of researchers in a number of disciplines have responded to problems in their own scholarly communication systems (caused mostly by the high costs and delays of commercially published journals) by establishing electronic archives of articles or papers, designed to make recent research in the field accessible without requiring that papers first be packaged in the journal form. Many of the papers, which authors post electronically directly into networked servers before they are accepted for formal publication, are published eventually in journals, sometimes in versions revised after readers' comments on the original posted versions. Other papers remain available solely in e-print form. At a minimum, advocates of "open archiving" aim to create more efficient scholarly communication systems within individual disciplines, as well as the means to disseminate scholarship to wider audiences. Some proponents emphasize the potential of open archives to provide free public access to scholarly papers. But an open archive does not necessarily make its content available free of charge. It is possible for commercial publish-


28. Although the servers are often referred to as "repositories" or "archives," open archives advocates do not use the terms in the technical sense in which they are used by those concerned primarily with preservation of digital (or print) media. See Clifford Lynch, Metadata Harvesting and the Open Archives Initiative, ARL Bimonthly Rep. 217, Aug. 2001, at 1, 1.

29. The term e-print is generally used to refer to any paper published in an electronic archive; preprint usually refers to papers that have not yet been formally published elsewhere in a print or electronic journal; postprint refers to electronically archived versions of articles that have been published elsewhere. For a discussion of the nomenclature of scholarly publication, see Kling et al., supra note 19, app. A.

30. See the recent statement of the Budapest Open Archives Initiative, at <http://www.soros.org/openaccess/read.shtml> (Feb. 14, 2002) ("By 'open access' to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself.") [hereinafter BOAI statement]. See also Lynch, supra note 28.
ers to incorporate open technical protocols to make their servers interoperable and their fee-based publications archives accessible through the same means as the free-access servers.31

The best-known and most successful e-print archive was established with federal government support in 1991 for researchers in high-energy physics and several other scientific disciplines by the physicist Paul Ginsparg at the U.S. National Laboratory in Los Alamos, New Mexico.32 Ginsparg's server, known as arXiv.org (<http://www.arXiv.org/>), allows researchers to post their research on the Web without traditional peer review. Along with cognitive scientist Stevan Harnad33 and mathematician Andrew Odlyzko,34 Ginsparg is well known for his skeptical views on a number of issues in contemporary scholarly communication in the sciences, including the practices of peer review, the effects on research of the costs of traditional scientific journals, and the time it takes for papers to be published.35

To post a paper on the arXiv.org server, a researcher prepares her work in one of a number of accepted formats, then submits the paper by e-mail or FTP, or through forms on the arXiv.org Web pages. Interested readers find out about new papers through e-mail notification services or by searching the site. Once posted, papers can be read and commented on; authors can respond to comments, rework papers, and post revised versions of their work. Eventually many of the papers are submitted and selected for formal publication in the traditional journals in these fields; frequently the final edited version is itself posted on the arXiv.org site.36

Is the arXiv.org model transportable to other fields? An ambitious 1999 attempt by the National Institutes of Health to establish an electronic preprint server for research papers in biomedicine was much less successful than


32. In 2001 Ginsparg and arXiv.org moved from Los Alamos to Cornell University, where the archive is part of Cornell's digital library initiatives. Some accounts of the move suggest that decreasing support for the project at the National Laboratory prompted the move. See Declan Butler, Los Alamos Loses Physics Archive as Preprint Pioneer Heads East, Nature, July 2001, at 3.

33. Most of Harnad's writings, as well as links to online discussions of the issues he raises, can be found at Stevan Harnad E-Prints on Interactive Publication, at <http://cogsci.soton.ac.uk/~harnad/iptpub.html> (last visited Sept. 25, 2002).

34. See Odlyzko, supra note 7.


Ginsparg’s project. As initially presented (under the name E-Biomed), the NIH idea was to create low-cost barrier-free access to biomedical research, thereby speeding the dissemination of information, allowing the incorporation of multimedia into research reports, deepening discussion among scientists, and reducing frustrations with traditional mechanisms for publishing.\(^{37}\)

The public announcement of the E-Biomed proposal generated great criticism and comment within the biomedical research community and academia generally.\(^{38}\) In addition to the expected criticisms from publishers of established journals in the field concerned about the effects on their revenues, some observers questioned the wisdom of giving either the public or practicing physicians too ready access to health-related research that had not been peer reviewed and adequately tested for reliability. Others criticized the proposal for not being radical enough, because it called for minimal review prior to posting. When eventually launched in February 2000, the original NIH proposal had evolved into PubMed Central \(<http://www.pubmedcentral.nih.gov>, a digital archive of peer-reviewed life-sciences journal literature. It did not include unvetted papers.\(^{39}\)

Although the NIH initiative was seen as a failure, at least in terms of its initial vision, numerous other e-print archives have been established by institutions, groups of researchers, and individuals in a range of disciplines in the sciences and social sciences.\(^{40}\) The U.S. Department of Energy’s PrePRINT

37. These are many of the same advantages claimed for arXiv.org, which is visited by thousands of readers per day. In some ways the NIH proposal was less radical than Ginsparg’s server, which provides no mechanisms for peer review of posted papers. As first envisioned, the NIH server would have had two parts: one for papers that had undergone brief review before posting, the other for papers that had undergone something closer to full peer review. See Press Release, E-BIOMED: A Proposal for Electronic Publications in the Biomedical Sciences, available at \(<http://www.nih.gov/about/director/pubmedcentral/ebiomedarch.htm>\) (May 5, 1999).


In 2001 a group of biomedical researchers, some of whom had been involved in the NIH E-Biomed proposal, circulated—and eventually got over 30,000 signatures to—an open letter urging the establishment of an online public library based on PubMed Central, which would provide free access to all research and scholarly discourse in medicine and the life sciences. The effort, organized under the name Public Library of Science (PloS), initially called for a boycott of all journals that would not agreed to archive their articles in the PubMed Central database or other online public resources within six months of the initial publication date. See PloS Open Letter at \(<http://www.publiclibraryofscience.org/plosLetter.shtml>\) (last visited Sept. 25, 2002). In 2002 its leaders were discussing creation of new online journals under the PloS name. See Robin Peek, The Future of the Public Library of Science, Info. Today, Feb. 2002, at 28; Myer Kutz, The Scholars Rebellion Against Scholarly Publishing Practices: Varmus, Vitek, and Venting, Searcher, Jan. 2002, at 28.

40. Examples include CogPrints (cognitive sciences, psychology, neurology, and linguistics) \(<http://cogprints.soton.ac.uk/>\) (last visited Sept. 25, 2002); RePec (economics) \(<http://netec.mcc.ac.uk/RePEc/>\) (last visited Sept. 25, 2002); and NDLTD (theses and dissertations) \(<http://www.ndltd.org/>\) (last visited Sept. 25, 2002).
Network site <http://www.osti.gov/eprints/> facilitates access to e-prints mounted on diverse sites in areas of science and technology related to DOE’s research interests, and provides a searchable gateway to an estimated 400,000 documents on the servers it covers. In some archives scholars are permitted to post articles at will. Others use (or have discussed using) a minimal form of peer review before posting.

Growing international interest has fostered the development of several ongoing initiatives and programs in support of open archiving activities. Perhaps most notable is the Open Archives Initiative (OAI) <http://www.openarchives.org/>, an effort devoted to developing interoperability standards for common interfaces and approaches, searching, and other services, with the end goal of facilitating international and interdisciplinary access to electronically published scholarship. In 2001 the group issued a “Protocol for Metadata Harvesting,” an application-independent framework for use by providers of e-print servers and by other communities engaged in publishing content on the Web.

In February 2002 proponents of open archiving received significant funding from the Soros Foundation’s Open Society Institute. Organized in support of principles outlined in the Budapest Open Access Initiative, the effort calls for free access to scholarly literature published in journals or in preprint form and recommends the development of OAI-compliant self-archiving tools for scholars and support for alternative journals committed to open access. The Soros support will be devoted to promoting institutional self-archiving, developing new open-access journals, and “help[ing] an open-access journal system become economically self-sustaining.”

**Implications for Scholarly Communication in Law**

What impacts might open archiving have in disciplines beyond those that have already employed it? A study of how physicists use the arXiv.org server suggests that its success is closely connected to the preexisting culture of communication among high-energy physicists. They have always operated in a

41. The PrePRINT search engine is estimated to provide access to 3,000 to 7,000 sites. See The Future of the Electronic Scientific Literature, Nature: Web Debates, at <http://www.nature.com/nature/debates/e-access/Articles/opinion2.html> (last visited Sept. 25, 2002).

42. For a description of types of open archives, see Chan & Kirspop, supra note 31.


45. BOAI statement, supra note 30.
preprint culture; they are used to circulating drafts of papers both to establish priority for their research and to refine papers before publication. They are computer-literate enough not to be hesitant about the self-archiving process. And journal publishers in the field accommodate authors' posting their works in the archive, even after a paper is accepted for publication.46 From a scholarly communications perspective, critics of the NIH E-Biomed proposal pointed out the differences between physicists' scholarly communication patterns and those of humanists, social scientists, and nonphysics scientists, noting that biomedical researchers did not have a preprint tradition and there was little evidence that they were clamoring for an e-print service.47

The reactions to the NIH proposal emphasized the role of each discipline's own discourse community in establishing the basis for meaningful communication within that field. Discourse communities are characterized by the language, forms, and traditions that members use to communicate with each other, advance knowledge in the field, and initiate new members into the group, and by specific genres of communication (such as the law review article for legal scholarship) and lexicon (technical terminology, shorthand terms, abbreviations).48 Discourse communities are developed and maintained both by the practicing members of the community (the creators and users of scholarly information) and by those who support the community (libraries and publishers).49

Skeptics of the general applicability of open archiving have stressed the need to pay more attention to traditional differences in scholarly communication patterns, norms, and formats among the disciplines, and have criticized what some see as a one-size-fits-all approach to electronic scholarly publishing promoted by the early proponents of e-print servers.50 In offering cautions about the universal applicability and benefits of approaches modeled after the Ginsparg server, critics of open archiving have made useful contributions to conversations about the role of information technologies in the future of scholarly communication. Solutions that work in one field of study might not be appropriate for all, and it is necessary to understand the particularities of the existing scholarly apparatus and patterns of communication among schol-

46. See Pinfield, supra note 36.
47. For discussions of the differences in cultures between physics and biomedicine, see Kling et al., supra note 39; Kutz, supra note 39.
49. For an eloquent discussion of the role of scholarly documents in creating and nurturing "textual communities" among scholars in a field, see John Seely Brown & Paul Duguid, The Social Life of Information 190–97 (Boston, 2000).
ars and researchers within each discipline. In looking at the success of arXiv.org, it is especially important to note the financial and other support provided by federal agencies and the National Laboratories.\textsuperscript{51} How many other fields will have the ongoing funding required to develop, operate, and maintain centralized systems designed to cover the literature of an entire discipline? Yet, in an evolving communications environment, it is also important not to overemphasize traditional differences in scholarly communications practices to the extent that perceived differences discourage experimentation with new models developed outside one's own field.\textsuperscript{52}

The relatively sparse development of electronic journals in law\textsuperscript{53} might seem to argue that alternatives to the journal form for disseminating scholarly legal literature are as unlikely to succeed as the original NIH proposal in biomedicine, a scientific field with scholarly communication patterns presumably much closer to high-energy physics than to law.\textsuperscript{54} But law schools and legal scholars have demonstrated growing support for certain forms of electronic publication outside the traditional journal format. Examples include individual authors' postings of papers on the Web site of the Legal Scholarship Network\textsuperscript{55} and the interest of a wide range of law schools in publishing Web-based working papers series, either on law school Web sites\textsuperscript{56} or through LSN.\textsuperscript{57} The working papers series reflect law schools' interests in promoting

\textsuperscript{51} See Kling et al., \textit{supra} note 19.

\textsuperscript{52} In the sciences, for example, open archiving and Internet publishing are seen as means for improving access to new research in developing countries, and for improving the flow of information and ideas on a global basis. See Chan & Ksorop, \textit{supra} note 31; Colin Day, \textit{Globalizing the Exchange of Ideas}, Chron. Higher Educ., Feb. 1, 2002, at B7, B9.

\textsuperscript{53} Some sense of the extent of electronic publishing at U.S. law schools can be found through FindLaw's list of Academic Law Reviews and Journals, at \texttt{http://stu.findlaw.com/journals/index.html}. In a check of the site on March 20, 2002, the list of general law reviews provided links to school-named law reviews at 130 U.S. law schools and suggested that 24 of those journals provided at least some full-text coverage. Of those 24 journals: four provided the full text of articles in .html format; 12 allowed readers to download .pdf files of articles; one (Duke) provided both .pdf and .html; one (Villanova) provided links to versions of the articles as working papers published by the Legal Scholarship Network. Four journals listed as providing full text did not; two sites were unavailable when checked.

\textsuperscript{54} At least one observer has suggested that the literature of law is both conceptually and structurally more similar to that of the sciences than the social sciences, noting the importance of serials, the number and forms of indexes, and the importance of precedent and currentness for both law and science. See John D. Kawula, \textit{Similarities Between Legal and Scientific Literature}, 84 Special Libr. 85, 85–87 (1993).

\textsuperscript{55} LSN is a division of the Social Science Research Network \texttt{http://www.ssrn.com/} (last visited Sept. 25, 2002), which includes several other components (e.g., accounting and economics) in addition to law.

The most significant prior development in electronic publication of legal scholarship was the establishment of law review databases on Lexis and Westlaw. Each of those services has developed substantial full-text libraries of law review articles for many journals back to the early to mid-1990s. See Hibbits, \textit{supra} note 1, at 658–60. The William S. Hein Company's Hein Online service, at \texttt{http://www.heinonline.org/} (last visited Sept. 25, 2002), is an image-based retrospective database of articles from more than 250 journals.

\textsuperscript{56} The Jurist Web site provides links to several models for working papers series published at law schools. See \texttt{http://jurist.law.pitt.edu/ol_artcl.htm} (last visited Sept. 25, 2002).

\textsuperscript{57} LSN publishes more than 50 law school working papers series, focusing on law and economics or public law and legal theory. Seventeen schools participate in both series. See Legal Scholarship Network Journal Offerings \texttt{http://www.ssrn.com/update/lsn/index.html} (last visited Sept. 25, 2002).
the scholarly work produced by their faculties. They also are a sign of legal scholars' interest in new opportunities for publication through the Internet and the World Wide Web, not only as creators and consumers of the literature but as active participants in disseminating their work.\footnote{See Evan P. Schultz, Napster for Law Professors: Electronic Publishing of Law Review Articles Is Sweeping the Legal Academy, May 10, 2001, at <http://www.law.com/servlet/ContentServer?pageName=OpenMarket/Xcelerate/Preview&c=LawArticle&cid=1015979394271>.}

In considering the potential benefits of these approaches, it is worth bearing in mind an important insight of the open archives advocates. As Harnad and Ginsparg and others have pointed out, the recognized functions of scholarly communications systems (providing quality certification, enabling distribution and access, indexing the works, and providing means for archiving them) can be separated or "decoupled" in an electronic publishing environment in ways that they cannot be in an all-print environment. Most important, the quality certification that typically attaches to having an article accepted for publication in a print (or electronic) law review can be distinguished from the distribution and access function, and it need not be lost if authors choose to self-publish their papers on the Web or post their work on a law school server.\footnote{See Guédon, supra note 14, at 53–54.} There is no necessary reason for authors to consider e-print posting and journal publication as exclusive alternatives, or for authors interested in posting their finished work on an e-print server to forgo publication in a leading law review.\footnote{The AALS Model Author/Journal Agreement distributed to law review editors in 1998 allows authors to post works accepted for journal publication "on an Internet or Intranet site over which the Author has effective control." See Memorandum from Bari Burke to Deans of Member and Fee-Paid Schools, available at <http://www.aals.org/98-24.html> (May 18, 1998).}

Law teachers' appreciation of this point is seen in the popularity of the Web-based Legal Scholarship Network, a division of the Social Science Research Network (SSRN). At present LSN offers about fifty subject-matter "journals," delivered via e-mail under titles such as "Administrative Law," "Contracts and Commercial Law," and "Cyberspace Law," as well as the law-school-sponsored working papers series mentioned above.\footnote{LSN also provides the full text of several law-school-published journals. See Legal Scholarship Network Offerings, at <http://www.ssrn.com/lsn/> (last visited Sept. 25, 2002).} For individually posted papers, LSN's approach and features are not unlike those of arXiv.org: papers (usually published articles or papers accepted for publication) are submitted for posting by faculty authors or their schools; the e-mail journals package new papers by subject and provide links to the full text of the papers on the LSN Web site. Institutional site licenses entitle law teachers to subscribe to any number of the LSN e-mail journals, and the papers are also searchable and downloadable in .pdf format through the LSN Web site. Nearly all U.S. law schools have site licenses to LSN, as do a large number of law schools outside the U.S. and many law firms and corporations.\footnote{For a list of LSN site license holders, see Legal Scholarship Network Site Subscriptions, at <http://www.ssrn.com/update/lsn/lsn_site-licenses.htm> (last visited Sept. 25, 2002).}
the SSRN Web site can be searched by author's name, by abstract/article title, or by words within the text of the abstract. After locating a paper, a researcher can read an abstract and (if the author has deposited an electronic copy of the paper in the archive) view and print a .pdf file of the full paper without charge.

SSRN and LSN thus serve to approximate the discipline-level archives of scholarship being developed in other fields, and the popularity of the service for both authors and researchers supports the case for the applicability of the e-print server model to law. LSN's most popular paper has been downloaded over 27,000 times; over ninety others have been downloaded more than 1,000 times apiece; even the 500th-most-popular paper has been downloaded over 300 times.63

LSN's popularity signals the successful entrance of a commercial publisher into the publication of legal scholarship, an area of legal publishing that has been almost entirely outside the commercial realm. In other fields scholars (and the libraries that support them) have endured the effects of the pricing policies of large commercial publishers operating in small, inelastic markets. In the STM fields skyrocketing prices were a primary incentive for development of the e-print servers described above. LSN's initial prices for subscriptions and institutional licenses are low. But it is worth noting that law, which has always enjoyed low-cost access to its scholarly literature through its institution-based publishing system, could become reliant on commercial services to provide electronic access to new papers at the same time that scholars in other disciplines are looking to technology to create alternative noncommercial means of access to their literatures.

Commercial publication of legal scholarship provides at least some reason for the legal discourse community to be concerned about future costs of access, especially in light of the traditionally low costs of access under the law review system. Electronic publishing initiatives designed to cover the entire literature of a field are likely to require continuing revenue growth to improve interfaces and search engines, and to maintain acceptable performance as the database grows in size and use as well as eventual return on investments made.

Will there come a time when a commercial database becomes so rich in content, and electronic access so favored by legal scholars, that scholars will turn there first, rather than to the edited versions of papers packaged in the law reviews? Even if their papers are eventually published in journals, scholars might prefer also to post their works on a well-supported commercial service in order to be sure they are read, and to urge their institutions to pay the costs of posting and access even as those costs increase. What happens then to the law review system or, put more properly, to the system of local law-school-based publication of legal scholarship? Will financially strapped law schools have the resources to support both publication systems?

Open Archiving Alternatives for Law

Law teachers, of course, do not have to rely on commercial services for publication and dissemination of their scholarship. The rapid development of World Wide Web sites at nearly all U.S. law schools has lowered the barriers for schools wishing to publish journals and working paper series electronically, and for individual authors wishing to self-publish their work in advance of its appearance in more traditional venues. Institutional support for electronic publishing initiatives and encouragement of experimentation can provide an effective counterweight to commercial development of the electronic publishing space for legal scholarship, keep prices low, and help law schools maintain and improve their traditional roles in publishing and distributing the literature of the field.\(^4\)

It is possible to forecast an eventual transformation of the traditional law review system from a print to an electronic environment, presumably after a transitional period during which most journals continue to appear in both print and electronic formats. Increasingly legal scholars and researchers will look to the Web and other electronic venues as primary or even exclusive sources of information, and law school deans will surely see that electronic publication is cheaper than print and capable of broadening a journal's audience, at least for the secondary subject-specific journals that have proliferated at many schools in recent years. But even an immediate full-scale movement of law journals from print to electronic publication would not resolve all of the inefficiencies and other problems that the law review system poses for legal scholars.

The ready availability of the World Wide Web at law schools and universities has already fostered creative publishing activities at law schools and by individual scholars.\(^5\) A project to support experimentation in publishing scholarly literature in law is being developed in a cooperative effort of the Harvard Law School Library, the Cornell Legal Information Institute, and other law schools under the name LEDA (for Legal Education Document Archive).\(^6\) LEDA is a Web-based electronic publishing system, designed to provide law schools with the capabilities for creating local e-print servers, which can be used to hold and preserve whatever varieties of legal scholarship (working papers, published articles, theses, briefs) a school chooses to include.\(^7\)

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\(^4\) Westlaw, Lexis, and LSN do not acquire exclusive rights to the scholarship they publish electronically, nearly all of which is published also in law reviews and is available increasingly on law school Web sites. Any new commercial entrants will also operate in a competitive market that already includes those firms, as well as any new electronic publishing initiatives from the law schools themselves.

\(^5\) Prominent examples are Cornell Law School’s Legal Information Institute <http://www.law.cornell.edu/> (last visited Sept. 25, 2002) and the Jurist site created by Bernard Hibbitts at the University of Pittsburgh School of Law <http://jurist.law.pitt.edu/> (last visited Sept. 25, 2002).


New initiatives in self-publication and institutional working papers series make legal scholarship accessible outside the journal system, but they also raise the questions of how researchers will know that the papers are posted or be able to find them, given the amount of material posted on the Web and the primitive nature of current finding tools. How can scholars who have posted papers individually or as part of a law school working papers series make sure that someone reads their work? How can other researchers be sure that they have found electronically posted scholarship needed for their research?

Like arXiv.org and LSN, LEDA allows scholars to post documents directly (or with assistance) and make them readily available to others. In contrast to those services, however, LEDA envisions not a centralized digital archive of legal scholarship, but a system based in documents posted on distributed, but linked, Web servers housed at individual law schools. Searches can be performed either on a local server alone or simultaneously on all LEDA servers. LEDA thus recognizes the tradition of school-based publication as part of the discourse community in law, and can be seen as a supplement or complement to existing journal publishing activities.

As a localized approach, LEDA provides the benefits of experimentation and variety, and should allow for both incremental and strategic innovation by participating schools. It also ties in with law schools' growing interests in publishing faculty working papers, and supports and complements other forms of scholarly communication (journals, conference proceedings, etc.).

Once enough documents are posted in law school LEDA servers, the system has the potential to be a useful research tool through its own search engines. It can also provide the basis for developing a variety of products—working papers series, new kinds of journals, and other "packages" for publishing and distributing legal scholarship electronically. Such products could be school based, providing access to papers and articles housed on a particular law school's LEDA server; based in the research areas of particular scholars (e.g., Best Intellectual Property Papers of the Month, providing filtered access to selected papers archived at servers across the LEDA network); or designed to provide a ready distribution service for authors interested in getting their work out to readers as quickly as possible. The distributed network of LEDA servers thus provides the means for local experiments in publication of journal and nonjournal documents, and provision of services based on the linked archives of documents.

68. It is expected that LEDA servers will operate in conformance with the developing Open Archives Initiative standards and will allow for cross-server searching.

69. See Kling et al., supra note 19, for discussion of the benefits of the "Guild Publishing Model," under which scholarship is disseminated through servers housed and operated in academic departments (or schools) and research institutes. Kling and colleagues cite successful institution-based repositories in a variety of other disciplines: economics, business, demography, computer science, and physics, as well as the energy-related sites indexed by the Department of Energy's PrePRINT Network. See also Raym Crowe, The Case for Institutional Repositories: A SPARC Position Paper (Washington, 2002); Jeffrey R. Young, "Superarchives" Could Hold All Scholarly Output, Chron. Higher Educ., July 5, 2002, at A29.

Looking Ahead

The technology to develop and support future scholarly communication systems will not come cheap, especially as researchers learn to expect more from electronic documents than mere desktop delivery of flat files to download and print. Features that might be seen now as frills—universal and persistent links to cited references, regular integration of media elements into text, and sophisticated search and navigation systems—will be considered essential elements of scholarly communication in the future as more writers take advantage of the tools available to them. The costs for continued development to meet the requirements of the changing nature of electronic documents, as well the largely unexamined costs for preserving electronic literature, raise questions about the capabilities of the scholar-driven systems, whether localized or developed at the discipline level. Business models for successful open archives systems are yet to emerge.

But the distributed network of LEDA servers provides relatively inexpensive means for local experimentation and customization, and for provision of services based on a system of linked servers housed in law schools. It creates the potential for an accessible and open space for electronically published legal scholarship that could resolve some of the long-standing shortcomings of the law review system, while preserving the institutional benefits of traditional school-based publication.

Can collaborative, open-access, noncommercial approaches like LEDA hope to provide these kinds of things, as well as the means for developing permanent and accessible archives of legal electronic scholarship? Because the future directions of scholarly communications technologies cannot be predicted with assurance, it will be wise for law schools to encourage and support experimentation and to keep open a wide range of options. It will perhaps be wise also for law faculty, like their colleagues in other fields, to take an active role in developing the future systems through which their work will be communicated.