6

Cooperative

A recent, if somewhat obscure, crime story throws further light on the economics of digital access. The victim of this intellectual-property crime was JSTOR, a nonprofit organization that offers online access to the back issues of scholarly journals. JSTOR was founded in 1995, as an initiative of the Andrew W. Mellon Foundation, which is playing a leading role in the introduction of new technologies into scholarly communication. JSTOR offers institutional subscribers, largely university libraries, online access to *complete* sets of journal back issues. It provides readers with digitized images of the original journal pages, and an ability to search the journal, for what is currently 600 journal titles, from the *Academy of Management Journal* (launched in 1963) to the *Yale Law Journal* (founded in 1891). As it continues to add back-issue sets to its collection, it brings considerable historical depth and reach to the online journal literature, dating back to the first issue of the *Philosophical Transactions* from March 6, 1665.

However, in the autumn of 2002, this nonprofit archive "experienced a sophisticated attack," according to Kevin M. Guthrie, then president of JSTOR. The breach enabled someone to "to systematically and illegally download tens of thousands of articles from the JSTOR archive" ("Unauthorized" 2002, 16). The hacker had apparently entered JSTOR by tunneling in through an unprotected proxy server on a campus (left unnamed) where the university library had a JSTOR license. As a result of the hack, 51,000 articles, drawn from eleven of the journals in the archive, were downloaded to an unlicensed computer without being detected in the process.

The Mellon Foundation set up JSTOR "to improve dramatically access to journal literature for faculty, students, and other scholars,"

according to William G. Bowen, president of the foundation, as well as "to mitigate some of the vexing economic problems of libraries by easing storage problems" (1995). The foundation, which might be thought of as the great venture capitalist of scholarly publishing start-ups, has always been keen to see a sound business plan for any new endeavor. "From the outset," Guthrie explains, "JSTOR was given the charge to develop a financial plan that would allow it to become self-sustaining—the Mellon Foundation was not going to subsidize the concept indefinitely" (1997).[1] JSTOR went on to establish agreements with commercial and nonprofit journal publishers, enabling it to digitize the publishers' back issues and offer them at a fee to its institutional members.[2] As part of its arrangement with publishers, JSTOR agrees to maintain a "moving wall" by which back issues are added to the collection once they are three to five years old (depending on the publisher's agreement). This is intended, of course, to protect for publishers the value of subscribing to the journal.[3] The model has since given rise, with variations, to the Mellon-supported ARTstor, which provides access to art images.[4]

1. William G. Bowen: "Perpetual subsidy is both unrealistic and unwise: projects of this kind [i.e., JSTOR] must make economic sense once they are up and running. If users and beneficiaries, broadly defined, are unwilling to cover the costs, one should wonder about the utility of the enterprise. In this important respect, we are strong believers in 'market-place solutions'" (1995). Bowen broke down the JSTOR cost savings for research libraries in 1995 as follows: Journal storage runs $24 to $41 per volume of a journal; binding issues into volumes is $24 to $41 a volume; and retrieval for users can run $45 to $180 per journal. A more recent study demonstrates the storage costs per journal volume in print to be between $48 and $353 a year (Schonfeld et al. 2004).

2. At current rates, institutional access to the complete JSTOR archive of 600 titles can cost as little as $750 annually (after an initial $500 capital fee), for a high school with low college enrollment rates, and up to $35,000 a year (after an initial capital fee of $90,000) for a large research university.

3. JSTOR also attempts to protect the publisher's copyright by forbidding patrons to download "a significant number of sequential articles, or multiple copies of articles," according to its Web site ⟨http://www.jstor.org/about/terms.html⟩.

4. From ARTstor's Web site: "ARTstor's purpose is to create a large—and indefinitely growing—database of digital images and accompanying scholarly information for use in art history and other humanistic fields of learning, including the related social sciences" ⟨http://www.ARTstor.org⟩.

For faculty and student alike at subscribing institutions, JSTOR is much like a round-the-clock research assistant, with the winged feet of Mercury, ready to search the stacks for a classic or overlooked journal article. For the Dalton School or the Horace Mann School—to name two of the small number of high school subscribers—it adds a layer of intellectual depth and distinction to their college-prep libraries. For the few public library subscribers, from Cleveland to San Francisco, JSTOR offers the public a way of digging back into a research literature that is otherwise rarely available outside of a substantial university library. For the North South University in Bangladesh and the Institute for International Relations in Vietnam, it provides the basis for an English-language research library.[5]

What then of this crime committed against JSTOR? Of course, the journal articles are not missing as a result of the piracy, nor does the theft represent lost potential sales or unrecoverable expenses for JSTOR. A library of the sort that subscribes to JSTOR is unlikely to be the culprit, and it is just as unlikely to buy "hot" copies of articles from a shady salesperson. What the size and scope of this essentially worthless act of piracy committed against JSTOR demonstrates, for me at least, is the *surplus capacity* within JSTOR for providing access to the back issues of scholarly journals. Hacking into JSTOR did no one any good, but perhaps under different circumstances, this excess access could feed the hungry minds of hundreds if not thousands of interested readers, without damaging JSTOR or its business model.

I do not mean to condone the crime by speaking of a surplus capacity. It is a crime with a victim. Good citizen-scholars will ultimately have to pay for the hacker's pilfering. In response to this theft, Guthrie asked librarians to beef up their "access control," through authentication, authorization, and certification systems. Scholars will be the losers, as more of the library's budget is devoted to shoring up security systems designed to keep such hackers at bay. Subscription fees for journals and

5. On JSTOR's international fee structure, the organization's Web site explains that "fee levels are … set taking into account the relative value of the JSTOR journal titles to the higher education community in the country as well as the local availability of fiscal and technological resources" ⟨http://www.jstor.org/about/intl_fees.html⟩.

JSTOR will be increased to cover similar measures within these organizations.[6] The librarians who responded to Guthrie's report of the crime on the LibLicense e-mail list (which connects librarians dealing with publishers' licenses and related services) were quick to recognize their need to protect intellectual property, although they cautioned that, as in any business, a loss from such forms of "shoplifting" is the price of doing business. They also wanted to ensure, given this talk of greater access control, that members of the public who visited their libraries could also use JSTOR without being members of the university, which is permitted within the current contract.

I want to suggest, however, that increased security systems may not be the only way to ensure that JSTOR's archive of research literature continues to be made available. Remember, providing free access to *additional* readers—beyond, say, the current set of subscribers—does not necessarily pose a threat to the system. If JSTOR represents one of the sustainable models for electronic publishing, is there a way to introduce an element of open access into its operations based on this surplus access? Piracy would no longer be an issue, certainly, but more importantly, the contents of these back issues would greatly increase in value as they became available to a much wider body of readers around the world.

Certainly, I am in no position to advise JSTOR on restructuring its current business model and am too filled with admiration for what it offers to risk losing it. However, I would like to borrow the JSTOR idea, for a moment, in ways that will not, I hope, be regarded as yet another intellectual-property hijacking. JSTOR has, in a handful of years, built up a clientele of over 2,000 institutional subscribers. This list continues to grow, although presumably at some point, that growth will level off. This JSTOR community of libraries, scholarly associations and publishers has every reason to continue to cooperate in providing access to back issues of the journal literature. In fact, it suggests the possibilities for a *cooperative* economic model for open access publishing. In terms

6. See Gallouj 2002 on how restricting access to knowledge only becomes more expensive and complicated as its transfer is increasingly simplified through inexpensive digital formats.

of American history, the precedent for such an approach goes back to Benjamin Franklin, who founded America's first and oldest continuing cooperative, the Philadelphia Contributionship for the Insurance of Houses from Loss by Fire, two decades after he established the country's first lending library in 1731.

The current membership of JSTOR, if you set aside the small number of public libraries and high schools that subscribe, could work in conjunction with the scholarly associations and other publishing bodies (such as university presses, publishers, research institutes, and groups of scholars), to form a cooperative involving both publishing and archiving. JSTOR has already demonstrated the level of cooperation that can be achieved among libraries, publishers, and scholarly associations. Donald J. Waters, Program Officer of Scholarly Communication at the Mellon Foundation, rightly refers to JSTOR as a "community-based organization" (2004). However, there may be a way to go a step further with this idea of giving back to the larger community, both academic and otherwise.

Membership in a publishing and archiving cooperative would enable libraries to participate more directly in journal publishing and archiving to ensure affordable access to research and scholarship. It would offer its members a means of containing and controlling costs, with cost containment far more of an issue for research libraries than reaping a wide-scale windfall from journals going open access. By drawing on the self-help initiatives of the cooperative movement, research libraries would simply be taking one step farther the consortia that they have formed to coordinate discount subscription and licensing fees from large publishers. Certainly, libraries are aware of a need to rethink their roles in this age of online resources from that of information procurers and providers. This sense of needed change is reflected, for example, in the Association of Research Libraries report on institutional repositories, of which e-print archives are a good example. The report notes that "library programs and budgets will have to shift to support faculty open access publishing activities in order for the library to remain relevant to this significant constituency" and that this is "a natural extension of academic institutions' responsibility as generators of primary research seeking to preserve and leverage their constituents' intellectual assets" (Crow 2000, 20).

Research libraries' greater involvement in publishing has its precedents, most notably with Stanford University Library's operation of HighWire Press, which I noted in chapter 1 is making a substantial contribution to the academic community by providing one of the largest open access archives in the world. And as I discussed in chapter 5, the library has also developed LOCKSS, an open source system for use in libraries for archiving electronic editions of journals, which has currently been installed by more than eighty research libraries worldwide. The system's software enables these libraries to automatically archive copies of electronic journal issues, preserving their content against loss and corruption. In other words, libraries are taking on new roles in reshaping scholarly publishing.

A publishing and archiving cooperative would capitalize on the technical infrastructure that research libraries have built up to support journals and other digital resources. It would utilize the collective information science expertise embodied in the library's staff to assist with the indexing and organizing of the publishing and archiving activities. The cooperative would, of course, draw on open source software for journal management, publishing, and archiving. The scholarly associations and other groups that joined the cooperative would bring their communities of authors, editors, publishers, and readers to manage and contribute to the journals and archives. Publishers might join or be contracted for editorial, design, portal management, and other services as needed. The member libraries would pay fees to the cooperative, perhaps based on some proportion of the subscription fees that they once paid for the journals that were now being published by the cooperative, as well as on institution size, as they do with JSTOR. Then there are the donor organizations that currently support developing-nation access to resources such as JSTOR and other publications; they might contribute directly to this open access cooperative, which would provide, in effect, greater access to more institutions in need. In appendix D, I present recent financial data from a sample of Canadian humanities and social sciences journals and JSTOR.

Of course, the idea behind the cooperative model is to turn the surplus access generated by online publishing to open access. With the surplus access afforded by digital distribution, not only would a publishing

and archiving cooperative ensure that its membership was well provided for, but it would offer the rest of the world open access to the research and scholarship for which it was responsible. Such a cooperative would avoid the dual economy of the open access e-print archive, in which the institution both supports the management of the archive, where its faculty members archive their published work, and subscribes to the journals that review and publish the work. The cooperative is a way of organizing a large-scale implementation of immediate and sustainable open access, one that is particularly appropriate for the humanities and social sciences. Those are also the areas, as it turns out, that JSTOR represents particularly well and the areas that need an alternative to the popular author fee model of open access in the biomedical sciences.

Yet the cooperative concept is not that far removed from the author fee model, which can take the form of institutional memberships. In such an "institutional membership" model, an institution pays an overall fee to a publisher such as BioMed Central on behalf of its faculty members, ensuring their right to publish in its open access journals.[7] Institutional membership fees, as well as author fees generally, create a situation in which the more prolific institutions carry the extra weight of their productivity, while affording everyone else open access. The difference is that rather than simply transferring funds from institution to publisher, as with the author fee model, the cooperative draws on the members' existing expertise and infrastructure to create a more efficient and integrated model, to the benefit of the world at large.

There is already something of a cooperative's spirit operating with the current setup of JSTOR. The organization began with 199 charter members, largely research libraries, and more than a hundred institutions donated back issues of journals for digitization. Those who subscribe to JSTOR have first to pay an initial capital fee, as might well happen with membership in a cooperative or club.

The members of an open access publishing and archiving cooperative would benefit most from the increased global access to the research

7. Currently, 451 institutions, principally universities (from forty countries), have become members of the open access (for-profit) publisher BioMed Central, which affords their faculty members the right (without having to pay the otherwise requisite author fees) to publish in its over 100 journals.

archives maintained by the cooperative, as their faculty members' work will make up the greatest part of these scholarly resources. If open access were found to contribute, however slightly, to a global research capacity, the less-privileged institutions would not be the only ones to benefit, as the leading institutional members of the cooperative have a long tradition of drawing on a global pool of academic talent and are themselves deeply invested in a research culture of critique and take-up. And there are signs that the larger public would benefit as well. The cooperative's open access contribution could certainly draw inspiration from JSTOR's admirable Secondary Schools Pilot Project, which, when it ran (from 2000 to 2002), made an impressive case for opening access to this segment of the public, or as one participating teacher reported, "Access to JSTOR has been extremely helpful to my rare but treasured moments of being able to read about and research some of the material I'm teaching for fresh perspectives" (quoted in Bhattacharya 2003).

As for membership in this publishing and archiving cooperative, the university libraries that make up the overwhelming majority of JSTOR subscribers, from Alabama State to Yale, would hardly question the need to continue supporting services that increased access to digital scholarly resources while containing costs, whether out of a sense of pride or of responsibility for the circulation of knowledge that is so clearly of benefit to themselves and others. Still, issues of fairness might arise, namely, over those institutions, including corporations with research libraries, that by not joining appear to be freeloaders. While it would stand against the spirit of open access, the cooperative could always limit access to communities of users who clearly fall outside the scope of the cooperative's membership community. An open access cooperative could grant free access to students and scholars in developing countries, patrons of public libraries, and students and teachers in high schools, as well as private scholars and dedicated amateurs. This would add, of course, to the management costs, but limited forms of open access are already being employed by a number of organizations and publishers. Or a cooperative might agree to offer a number of free downloads annually, perhaps starting with the figure of 51,000 articles, in recognition of the great JSTOR hijack that made the principle of surplus access so apparent.

Yet I am not sure that we have to limit open access in this way. The "tragedy of the commons," as this freeloading problem (which I introduced earlier) is known, may not apply in this case. Typically, the prospect of this tragedy undermines efforts to establish a commons out of a fear that someone will "snatch some selfish benefit" from the public good, as economist Paul A. Samuelson put it, in describing "the heart of the whole problem of *social* economy" (1954, 389).[8] Take the current wave of cooperation among higher-education institutions on open source software development, with the benefits made freely available and open to all. Twenty such open source projects were recently featured in the *Chronicle of Higher Education*, the best-known of which is the DSpace Federation, which MIT has formed among university libraries and other institutions that are using DSpace, its freely available software for setting up institutional repositories ("Open Source" 2004). The DSpace Federation's commitment to "sharing in the development and maintenance of the DSpace source code" speaks well to how libraries' role is changing in ways that gives credence to their playing a greater role in JSTOR-like projects.[9] The federation approach to DSpace, which was developed with support from the Hewlett Foundation and, once again, the Mellon Foundation, is the perfect complement to a publishing and archiving cooperative, as are the well over 100 institutions that have set up e-print archives employing the open source EPrints.org software for faculty members to use to provide open access to their published and unpublished work.[10]

In terms of which research libraries would participate in such a cooperative venture, I was encouraged by the recent declaration by a number of library associations—including the Association of Academic Health

8. At least one economics study has found people willing to support a greater public good, even as it decreases their chances to maximize their benefit (Kemp 2002, 18–20).

9. The quotation is taken from the DSpace Federation Web site ⟨http://dspace.org/federation⟩.

10. The Mellon Foundation and the Hewlett Foundation have also supported the development of the Sakai Project, which, as noted in chapter 5, is devoted to creating an open source course management system through a cooperative of forty-four institutions, with members paying $10,000 a year to get advance releases and be part of the community of college developers (Young 2004).

Sciences Libraries, American Association of Law Libraries, American Library Association, Association of College and Research Libraries, Association of Research Libraries, and Medical Libraries Association—that they are "ready to work toward solutions in cooperation" with the fifty scholarly associations (representing 300 journals) that signed the Washington D.C. Principles of Free Access to Science (SPARC 2004). The Washington Principles include a commitment to ensuring that the "full text of our journals is freely available to everyone worldwide either immediately or within months of publication, depending on each publisher's business and publishing requirements" ("Washington" 2004). It is easy to imagine the publishing cooperative idea taking on an international dimension as well, or perhaps subchapters would form around different fields, such as law, medicine, or the humanities.

I realize that establishing a formal cooperative represents a considerable step from these loosely organized efforts to setting up e-print and journal archives. Yet it builds on the same spirit of collaboration, cooperation, and common purpose to further access to research and scholarship, just as it would take advantage of existing technical resources, expertise, and connections. For those in charge of research libraries, the cooperative can further the library's interests in containing journal costs, something that e-print archives are not intended to do. Indeed, Stevan Harnad (2004b) has admonished librarians that it would be "a great strategic mistake to cancel" journals that permit authors to self-archive.

By the same token, the executives of scholarly associations might say that we might do far better to join forces with research libraries to ensure a steady line of support for what we do best, rather than worry over whether increased open access threatens our ability to sell subscriptions to our journals. We need a place, they might argue, amid all the new technologies, for sustaining existing journals and supporting new ones, including those independent of associations like ours, as this, too, ensures the continuing development of the field.[11]

11. The American Association for the Advancement of Science has recently insisted, in its report on scholarly publishing, on the importance of enabling the launching of new independent journals, by keeping entry barriers low for new publications of scholarly quality (Frankel 2002, 7).

As for the granting agencies and donors, is there not, they might well ask, some way to consolidate these hosting, archiving, reviewing, and publishing processes to create a well-organized and sustainable system that would increase the circulation of knowledge on a global scale? After all, as Donald Waters, a program officer of the Mellon Foundation, has pointed out, the "sustainability of digital scholarly resources" depends on three factors, namely, "a clear definition of the audience and the needs of users," sensible "economies of scale," and a well-organized means to "manage the resource over time" (2004). A publishing and archiving cooperative should represent nothing less than such an approach. And to assist its potential members in thinking about a reasonable economic model for this new organization, we have two models to draw on, thanks to the work of the Mellon Foundation. The first comes from a proposal recently put forward by Ira Fuchs (2004), Mellon's vice president for research in information technology, for an open source software collaboration in higher education. Fuchs's proposed collaboration would be, in effect, a cooperative that according to Fuchs's vision "might involve more than 1,000 colleges and universities from around the world," with each contributing "between $5,000 and $25,000 per year, based on size," which would "produce more than $10-million per year, enough to coordinate the development, packaging, delivery and maintenance of many of the key academic and administrative software applications that higher education needs." The second Mellon model is found in the subscription fee structure used with JSTOR, presented in appendix D, which would seem, given the funding levels it has attained, to offer an encouraging picture for the viability of such a cooperative.

This idea of a publishing and archiving cooperative among libraries, societies, and other publishing groups draws on a range of precedents, from open source development communities in higher education to library consortia. It is intended to stand as an alternative to prevailing assumptions that free-market principles prevail, and need to continue to prevail, in scholarly communication. It is meant to suggest an approach to sustainability that goes beyond setting up corporate entities to sell services, recovering costs plus, to the higher-education community. A publishing cooperative realizes a common cause among research libraries,

scholarly associations, and other publishing groups, as well as funding agencies. It makes sense for a core set of those research libraries to be directly involved in the hosting, indexing, and archiving of the literature, while the scholarly associations and related bodies oversee the management of peer review, editing, and layout, wherein lies their expertise and experience. Even apart from the potential efficiencies of such a cooperative, it is distinguished by its determination to turn the surplus access created by the Web into a far greater public good, at least when it comes to making scholarly resources available to a wider public and a global academic community.