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Over the past twenty years, a wide cross-section of academia has wrung its hands at the problem of the increasing gap between library budgets and journal prices. The university administration rails against the lunacy of paying for research to be conducted, then paying to get it back in a softbound volume with a publisher's imprimatur. The faculty bemoan the consolidation of publishing houses, which slows time to market and reduces choice. The library decries the increasing chunk of its budget that is swallowed whole by serials. The calendar pages turn, and the cycle begins anew.

Are we all boys who cried wolf? Is the 'scholarly communication crisis' akin to an imaginary pack of wolves? Large commercial publishers would say yes. The availability of journals, in terms of speed and convenience, has markedly improved in the past two decades. A researcher at the University of California has access to 241 databases from any computer in the world, containing tens of millions of commercially published articles. Isn't this the golden age of scholarly communication? Perhaps. But one must recall that the boy who cried wolf was eventually telling the truth. In the end, the wolves really ate his flock.

Are those wolf tracks I see?

Why have administrators, faculty members and librarians cried wolf in increasingly desperate tones over the past two decades? What footprints in the dirt do they see that have convinced them that crisis is upon us?

- *Journal prices.* According to the Association of Research Libraries, member spending on periodicals rose 227% between 1986 and 2002 (<http://www.arl.org/stats/arlstat/graphs/2002/2002t2.html>). This far outpaces the Consumer Price Index increase, which was 64%. Perhaps more alarmingly, that 227% increase in spending bought only 9% more serials.

Of wolves and and boys: the scholarly communication crisis

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ABSTRACT: The case for the self-publishing by academic institutions of scholarly research as a response to the 'serials crisis' is made against the background of the experience of Bepress. It is suggested that such arrangements provide a valuable and cost-effective answer to the problem.



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Even in recent years, as large publishers have promised to relax annual increases, the trend continues upward. The Library Journal's annual pricing survey (<http://libraryjournal.reviewsnews.com/index.asp?layout=articlePrint&articleID=CA289187>) shows large price increases by discipline between 1999 and 2003, from anthropology (55%) to biology (77%) to health sciences (75%) to history (53%) to sociology (67%).

- *Proliferation of journals.* Ulrich's *International Periodicals Directory* lists records for 26,303 peer-reviewed periodicals today. This represents a 28% increase since 1990 (source: Shawn Chen, R.R. Bowker). The vast majority of these new titles are operated by commercial publishers. A learned society such as the American Economic Association (AEA) still publishes the seminal journal in the discipline (*American Economic Review*). The AEA, like most not-for-profit societies, sells access at a very modest price, \$195, compared to the discipline's average of \$591. The AEA, however, has sustained no complementary peer-reviewed journals since the *American Economic Review's* inception in 1911. Commercial publishers have flooded the market with specialty journals that do not challenge the primacy of their learned society counterparts. Smaller circulations but vastly more titles is the strategy. The increase in the number of titles, combined with the increase in prices for existing journals, places tremendous strain on library budgets.
- *Market consolidation.* In recent years, larger publishers have moved to consolidate the market. Among the mergers and acquisitions have been Elsevier's purchase of Academic Press, the West-Thomson merger, Elsevier's acquisition of Harcourt, and the proposed sale of BertelsmannSpringer to Cinven and Candover, which owns Kluwer. The mid-sized publishers are as endangered as the flock of sheep in Aesop's fable. As the number of publishers decreases, so, too, does the leverage for the academy to challenge the pricing and bundling structures of their vendors.

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In summary, lots of journals + lots of money per journal + market consolidation = scholarly communication crisis. Are there benefits for the academy to be found among the variables in this equation? Of course. Lots of journals means better grouping of like materials, and provides more outlets for junior faculty. Market consolidation can create efficiencies, turning journals into subsets of larger portals (e.g. ScienceDirect). And steady price increases per journal, eating up ever-increasing shares of strained library budgets? Well, perhaps its best benefit is to serve as the wolf scat validating our cries.

No more tears: revenge of the Boy

So what's a boy to do? On one level, schools are fighting back to reduce costs. UC Berkeley recently ended all print subscriptions to Elsevier journals, saving \$342,000 (it should be noted that the institution still pays over \$1,000,000 for electronic access to Elsevier titles). Given the average annual price increases over the past 15 years, however, in four years Elsevier will recoup that cut, plus recognize the cost savings associated with print and mail costs. To mix fables, there aren't enough fingers to hold that dyke.

The academy is thus creatively pursuing a number of strategies to create viable publishing alternatives. The most promising among them include the university-as-publisher, open access publishing and born-digital journals. All of these implementations rely on new technologies to reduce the expenses associated with the traditional print publishing model. Taken in aggregate, these strategies may represent an important shift in the battle between Wolf and Boy. For the first time, the Boy isn't simply crying. He's rolling up his sleeves and taking it to the Wolf.

University-as-publisher

The idea that the university might take an active role in the publication of its scholarly information makes intuitive sense. As the chief benefactor of research within its walls, universities have longed chafed at the notion that this research is given away to commercial entities, then repurchased at a

premium. In addition to halving this double dip, universities have recognized other possible benefits of stepping into the publishing role. As a publisher, the university can provide outlets for monographs, working papers and other specialty publications. The relatively low print runs these materials require has led to their virtual disappearance from commercial vendors' publication lists. The university can also ensure persistent access to the scholarly information, un beholden to license fine print or Rowecom-style collapses. The university might also present aggregated material in a certain fashion to create a better representation of scholarship created within the institution.

Some university-as-publisher projects have been launched as specific alternatives to commercial journals. The University of Arizona, for example, launched the *Journal of Insect Science (JIS)* in 2001 as direct competition to *Archives of Insect Biochemistry and Physiology*. As the institutional price rose from \$250 to more than \$2,000 over the past 15 years, the editor became increasingly disillusioned (see <http://www.insectscience.org/about/change/index.html>). Similarly, *Algebraic & Geometric Topology (AGT)* is a University of Warwick-sponsored journal that competes with the \$2,500 *Topology and Its Applications*. It, too, came into being when an editor of the commercial journal grew frustrated and broached the subject of an alternative with his university. AGT is sponsored by the mathematics department; JIS by the library. Both are free to readers, and manage to keep costs low by relying on electronic dissemination of issues.

Other university-as-publisher projects are more ambitious, seeking to create institutional repository platforms for the wholesale dissemination of information. Examples include MIT's DSpace project and the University of California's eScholarship Repository. DSpace, a joint initiative of MIT and Hewlett-Packard, seeks to capture and display the university's intellectual output along broad community (e.g. business, engineering) lines. Five of these nodes have been established since Nov 2002. The eScholarship Repository, supported by technology developed by The Berkeley Electronic Press and run as a joint

project of the California Digital Library and the UC Office of the President, launched in July 2002. It clusters research materials around organized research units such as the Olin Program in Law & Economics or the Scripps Institution for Oceanography. More than 100 research units have established a presence within the repository. Both the MIT and UC platforms have more than 2,000 posted materials.

One interesting facet of the MIT/UC approach is how a paper in the platform may be viewed from various perspectives. As an exercise, go to Google and search for 'appeal of Islamic radicals'. Among the top results should be a paper written by a UC Santa Cruz professor. A researcher interested in this paper might limit himself to a one-click download of its full text. If the researcher is a curious person, she might notice that this paper is part the Center for Global, International and Regional Studies series. Looking for context, the researcher could easily discover with another single click a wealth of other papers on social and political structures, all affiliated with this Center. Working up yet another level, the researcher might be interested to see how the Center for Global, International and Regional Studies fits into a larger University of California context. This could again be accomplished in a single click.

Another facet of these early repository projects is their tendency to lean heavily toward grey literature such as working papers, reports and so on. These institutional repositories recognize some of the benefits of university-as-publisher described above (persistent access and prominent display of materials), but do not, at present, represent a broadsided offensive on traditional peer-reviewed journals. Perhaps this will change as groups like the University of California International and Area Studies program launch refereed publications within the institutional repository framework.

Open access publishing

Another alternative the academy is exploring is open access publishing. Broadly defined, open access journals are publications, almost without exception electronic,

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universities and government agencies are expressing support for open access publishing models

that provide free access to full text. Many of the open access initiatives are scholar-driven, such as the Public Library of Science (PLOS). PLoS was founded by researchers at Stanford, UC Berkeley and the National Institutes of Health (NIH) who felt strongly that the transfer of human knowledge should not be short-circuited by commercial entities. PLoS gathered 30,000 signatures in 2001–2 from scientists expressing solidarity with the notion of better access to research. Buoyed by this support, PLoS announced plans this year to launch a series of STM journals. The PLoS publications will be free to readers, and authors will be asked to pay a submission fee of \$1,500 upon acceptance of their papers. This will help defray the costs of peer review, editorial support and dissemination.

Universities and government agencies are expressing support for open access publishing models. More than 250 institutions have become members of BioMed Central, an open access publishing portal. Membership, which typically falls in the \$1,500-\$10,000 annual range depending on the institution's size, allows all affiliated researchers to waive the \$500 submission fee associated with the 125+ BioMed Central journals. In essence, the site license has flipped from the subscription side to the submission side, at a substantially lower cost. A university paying \$5,000 in BioMed Central membership fees has reason to support the open access model. The cost of these 125 BioMed Central journals under the traditional subscription structure, if set at the health science average of \$850, would be \$106,250. It should be noted that while BioMed Central is a private firm, it has created a number of checks to guarantee perpetual open access in the event of its sale (see <http://www.biomedcentral.com/info/about/charter>).

US Congressman Martin Olav Sabo has recently raised the profile of this approach with the introduction of the Public Access to Science Act. The bill would require research substantially funded by US taxpayer dollars to be made freely available to the public. The crux of the argument is that if the government of the people, by the people and for the people pays for the work,

then the people themselves should be allowed to read it freely.

Born-digital journals

While administrators and libraries pursue the university-as-publisher strategy and true believers in open access push for a new publishing paradigm, the individual researcher is quietly making an impact in more subtle ways. Much like the disillusioned editor of *JIS*, editors of existing journals are leaving their posts for smaller-scale alternatives. Few of these, however, are funded as university projects. By way of illustrative example, I present my own organization, The Berkeley Electronic Press. Founded in 2000, we have now launched 21 low-cost, born-digital journals. Each is run by an editorial team of formerly frustrated scholars. Some were frustrated by the rising subscription costs of their journals. Other were frustrated by the long time delays and increasing inefficiencies of the print journal workflow. All felt passionately enough about the problem to seek a new path. They are part of a growing trend, reflected by other projects such as ELSSS (the Electronic Society for Social Scientists) and NOW Publishers, to merge the commercial with the altruistic. Emerging firms such as The Berkeley Electronic Press can produce and disseminate journals with greatly reduced costs. As private entities, we have identified a niche in the marketplace. This niche is to deliver scholarly information with the professionalism of a commercial publisher at the price of a not-for-profit one. In essence, we are pinned to keep our prices low because this is our market differentiator.

It remains to be seen whether the increase in born-digital journals is a trend or an anomaly. However, the emergence of this alternative gives frustrated editors an alternative they had lost through years of market consolidation.

Who's crying now?

One might argue that, with \$8.02bn in 2002 revenue, Elsevier, along with other high-margin publishers, is crying all the way to the bank. Perhaps this is true. Library advocacy groups such as SPARC have as yet

failed to create a cohesive strategy to beat the wolves. The DSpace and Berkeley Electronic Press institutional repository platforms have moved slowly to other academic institutions. The *JIS* experiment has not led to mass resignations at major journals across disciplines. The types of experiments mentioned in the section above are adding expenses to the university – in the form of technology fees, submission costs, etc. – that are not yet being counter-balanced by a reduction in commercial subscription encumbrances. And yet?

The University of California has begun to explore alternatives to its multi-million dollar relationship with the largest commercial publishers. The Public Library of Science has the support of 30,000 scientists. MIT's DSpace has a strong partner in Hewlett-

Packard. The US Congress is now considering the issue of access to research. These are powerful institutional, grassroots and commercial forces that are beginning to line up on the side of the Boy. It is thus possible that we have reached a turning point. We should not expect the Wolf to retreat quietly into the night, but for the first time in a long while the Boy might have a shot at winning this fight.

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