
Morton, Bruce. "Is the Journal as We Know It an Article of Faith? An Open Letter to the Faculty." The Public-Access Computer Systems Review 8, no. 2 (1997): 6-17.

1.0 Introduction

Since 1665, with the founding of the Journal des Scavans and the Philosophical Transactions of the Royal Society of London, the print-on-paper journal has functioned as the main mode of scholarly communication. [1] It has been suggested that, like manure, scholarly communication does not accomplish much--except for making the author feel good--unless it is spread around. It has been as a spreader and preserver of the word, of knowledge, that the scholarly journal has become the stalwart of academe.

Embedded in this glib scatology and analogy is one of the four basic pillars upon which scholarly communication has been built. In addition to wide dissemination, other pillars are timely distribution, assurance of scholarly integrity by virtue of peer review, and recognition and reward. The traditional paper journal has served for more than 300 years as an expedient way in which to accomplish these fundamental goals. But times are changing.

More than 50 years ago, Vannevar Bush recognized that "our methods of transmitting and reviewing the results of research are generations old and by now are totally inadequate for their purpose." [2] Fifty-two years later it is clear to me that the paper-based scholarly journal has outlived its usefulness. As someone who has built an academic career via publication in the traditional journal, it has taken me awhile to reach this viewpoint.

With a few exceptions, anyone who has had a manuscript languish in a publication queue knows that the specialized paper-based journal no longer is effective in the wide or timely dissemination of scholarship. However, the refereed and citation-laden journal article, by and large, continues to embody scholarly integrity and usually gets us recognition and reward. We need to explore how we might achieve scholarly communication that is more effective and that will still adhere to the academic values (well-thought-out, well-written, well-researched, well-documented articles) that we have always deemed important.

The issues that I wish to place before you have been fairly widely discussed over the last six years in publications and at conferences of various disciplines, as well as on the Internet. [3] The only original contribution that I shall claim to make to the discussion is the insight that I have derived from Thomas Kuhn's work on paradigm shifts.

2.0 Problems in Paradise

. . . But what power of mind,
Foreseeing or presaging, from the depth

Of knowledge past or present, could have feared
How such united force of gods, how such
As stood like these, could ever know repulse.
John Milton, "Paradise Lost"

There is something inherently irrational about a model that has an intelligent person giving away ownership of the fruits of intellectual labor to a commercial profit-driven enterprise in which he or she has no proprietary interest. Indeed, in many disciplines an author must actually pay on a per-page basis to have his or her work published, and then must buy back, or expect libraries to buy back, their work (or, similarly, the work of others) with all the recompense going to the journal publishing industry (and it is an industry). In my opinion, this is not an act of charity; it is one of stupidity. Alan Singleton has acerbically described the current situation as "at best, an unconscious conspiracy of money-grabbing publishers, foolish and vain academics, and cowardly librarians." [4] There is need for change.

A convergence of forces has led us to the current dilemma. Fundamental to the problem, of course, is the proliferation of scholarly or professional journals--over 130,000 and counting. Certainly, some of this is due to publish-or-perish pressures. But, by and large, we know more about more things than ever before and we keep learning; that is our business. Knowledge begets knowledge. Specialization has led to the growing number of journals with fewer subscribers per title, and, concomitantly, higher price per title. The net effect is a Balkanization of knowledge and the scholarly community, and a ratcheting down of expectation as to what constitutes wide dissemination and, for that matter, quality.

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Because major publishers, particularly in the scientific, technical, and medical fields, have merged over the last 15 years, thereby reducing competition, journal prices have risen steeply. Such escalation has made it necessary for academic libraries to engage in annual rituals of subscription cancellation. Journal prices and the profits of some of the largest publishers of journals have risen at annual double-digit rates while most university libraries have faced, and likely will continue to face, stagnant budgets or very low single-digit consumer price index-linked budget increases.

For the period of the last five years the average increase in serials budgets at libraries of research universities is about 50 percent (it is significantly higher for scientific, technical and medical journals), while the increase in the consumer price index for the same period is about 12 percent. It is an equation that has become radically unbalanced. As subscriptions are canceled, publishers raise prices further to compensate for the lost revenues, thus provoking more libraries to cancel subscriptions, and so it continues. The process reduces copies available and further limits distribution of, and access to, scholarly communication. Many view the situation as a crisis.

I have heard both librarians and publishers crystal ball-gaze as to the future of the academic journal. By and large, what I have heard is a self-serving and self-deluding rationalization of

escalating journal prices based on the economics of production and distribution (i.e., paper, composition, printing, editing, binding, warehousing, and postage), the need for an increasing number of pages, an increased number of issues/frequency, and/or electronic access to what one is already getting in paper. Such explanations have been understandably defensive in tone.

Ultimately, all such explanations boil down to "business as usual"--except that there will be electronic access. But, must it be business at all? There are powerful commercial interests that will attempt to coopt us or persuade us to believe that their interests are also our own best interests. However, perhaps there is a completely different way? One hopes that Alfred North Whitehead was correct when he observed that "the 'silly question' is the first intimation of some totally new development."

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3.0 Paradigm Shifts

And to make an end is to make a beginning.
The end is where we start from. . . .
T.S. Eliot, "Little Gidding"

My own thinking about this problem has been influenced by Thomas Kuhn's ideas about scientific revolutions, wherein he concludes that rather than science being an objective progression toward the truth, it is often moved forward by shifts in basic concepts that did not necessarily rationally follow from the status quo. Since Kuhn has readily admitted to appropriating concepts from a variety of disciplines to apply them to his own purpose, I take the liberty of doing the same in applying his ideas to the topic at hand. Kuhn noted that when the normal academic tradition changes, scholars' perceptions of their environment must be reoriented, until a paradigm seems incompatible with the old. [5]

When a new paradigm breaks with tradition and introduces a new idea with different rules within a different universe of discourse, it is likely to occur only when the first tradition is felt to have gone badly awry. [6] I submit to you that our current model of formally communicating scholarly ideas to one another via the printed word, on paper, in packages we call journals, addressed only to professional colleagues or their students who are assumed to have knowledge of the shared paradigm, to be read only by those at institutions that can afford to buy them, and sold by commercial publishers, has gone badly awry. [7]

The transfer of allegiances from one paradigm to the next is a conversion experience that cannot be forced. Resistance is to be expected, particularly from those of us who have built productive careers in the traditional paper-based journal. At root, the source of resistance is the assurance that the older tradition will ultimately solve all of its own problems--that knowledge can continue to be neatly fitted into the container that the paper journal paradigm has provided us. [8] However, I do not believe this is likely to be tenable as knowledge, nor that the demand for it will continue to proliferate.

Revolutions are created by a growing sense that an existing

regime has ceased to function adequately. Such explicit recognitions of breakdown are rare, but the effects of crisis do not entirely depend upon our conscious recognition of a problem. [9] Who among us, especially those in the scientific and technical disciplines, does not have at least some sense that there is something very wrong in respect to the diminishing availability of journals?

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Kuhn suggests that as a crisis deepens, many will commit themselves to some concrete proposal for the reconstruction of their society in a new framework. [10] I hope that each of you will consider doing so, because the current paradigm of scholarly communication has become inadequate; it requires either major renovation or replacement.

The issue that each of us faces, that we altogether must face, is to decide which paradigm should in the future be the basis for the communication of research and scholarship. Reservations and reluctance notwithstanding, one paradigm we feel comfortable with but can no longer afford; the other is initially uncomfortable but cannot be ignored. A decision will have to be based less on past achievement than on aspirations for future achievement. [11] The transition from a paradigm in crisis, as I believe the paper journal paradigm is, to a new one from which a new tradition of normal research and scholarship can emerge is not necessarily a cumulative process of transition from the old paradigm. [12]

In the past, major paradigm shifts have been driven by those very young or very new to whatever field, for they were not committed or limited by existing practice within the traditional rules of the game; it has been they who were particularly likely to see that the rules no longer defined a playable game and to conceive another set of rules that could replace the old. [13] Such has been mainly the case with the movement toward electronic journals.

Max Planck once remarked, ironically, that such paradigm shifts sometimes occur when the old, resistant generation dies off. But as a librarian watching journal subscription lists relentlessly shrink, and hearing faculty frustrations grow, I tell you, frankly, that we dare not wait for nature to take its course. We must begin to implement a process of change now. When the transition is complete, academe will have changed its view of the field, its methods, and its goals. [14]

4.0 Some Models for Consideration

Probably the single most prevalent claim advanced by the proponents of any new paradigm is that it can solve the problems that have led the old one to a crisis; and I do make this claim. [15] Kuhn asserts that to be accepted as a viable paradigm, a new idea must seem better than its competitors, but it need not, and in fact never does, explain everything with which it can be confronted. [16]

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Clearly, during a necessary period of transition, the road to a noncommercial system of refereed scholarly communication will

have many potholes (e.g., financial support, demands for bandwidth, archival memory, where to place the site(s), mirror sites, and mainstream indexing) that will need to be filled as we progress along it. Not to worry; we in academe are professional problem solvers.

Certainly, we do not wish to create the electronic equivalent of the cacophony of Hyde Park or the community bulletin board. There must be a reliable, orderly, and controlled environment in which electronic scholarly communication may take place. However, we must not fall prey to the fallacy of the ideal, whereby we would wait until a new system has been perfected and put in place before committing to it. We, all of us, must contribute now to making a new system happen; this is the ultimate sanction of a new paradigm--participation.

First, there should be a presumption of peer review. The new model could develop in either centralized or decentralized fashion. A decentralized model would have journals reside on servers locally wherever the editor or sponsoring institution might be. The centralized model, which I prefer, and which has been advocated by Jerry Campbell of the University of Southern California, would encompass many disciplines and fields and have a sponsoring agency, preferably a consortium (or consortia) of professional associations (such as the Association of Research Libraries, the American Association of Universities, the American Council of Learned Societies, the National Academy of Sciences, the American Association for the Advancement of Science, and/or foreign counterparts). [17] Such sponsorship of a "super site" would provide sanctioned stature--a surety that only bona fide scholarly work would be resident.

Another centralized model is that pioneered by Paul Ginsparg in the field of high-energy physics (because of its popularity among physicists it has since begun to include other fields within physics). At the Los Alamos National Laboratory, a database has been created of preprint articles in a non-journal database format that can be searched via search-engine software. It is currently receiving more than 40,000 hits per week.

The cost to maintain a central server and Web site, which would not be insignificant, could be covered by annual institutional site-gateway fees to be based on the institutional budget--more affluent institutions would carry a greater burden than the less affluent--or based on the number of teachers/researchers who potentially could place publications at the site. There are a variety of other funding models that would be viable as well.

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Of course, all of this is assuming that there will be a critical mass of resident titles. Faculty and students from participating universities would have unrestricted access to all articles at the site; I recommend unrestricted free access for anyone anywhere. The assumption is that once a critical mass of titles is achieved, the shared cost of maintaining the site would be far more economical for any participating institution than would access to similar information through the commercial sector.

A decentralized model, that which is becoming prevalent in the absence of broad-based planning, would have discretely titled

journals on local servers scattered throughout the country or world; access would rely on catalog references in libraries, title lists available locally or on the World Wide Web (WWW), or serendipity. There are numerous acceptable variants of these models.

Within either of these models, articles could be presented in a traditional journal format, with discretely titled and numbered serial issues occurring at regular chronological intervals. Or, articles could be streamed to publication as they are reviewed and accepted, as is done in the journal *Psychology*, which is sponsored by the American Psychological Association. *Psychology* uses the attributes of the electronic medium to create a forum for reviewed interactive reader commentary and author response to that commentary, providing the opportunity for truly dynamic scholarly communication.

A cornerstone of a new paradigm must be that copyright remains with the author or the employing institution. With electronic publication would be explicit permission for unlimited reproduction and conveyance for legitimate scholarly or other educational purposes, so long as credit is given to the author. In this model the process of communication predominates over the issues of product and ownership embodied in the present commercial model. Copyright is an instrument originally developed, at least in the United States, to be an incentive to creative activity, by enabling the creator to reap the rewards from his or her work. Unfortunately, copyright has become the fuel for the engine that drives the profits of the journal publishing industry.

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If a faculty member commercially publishes a book, it is not unusual for him or her to receive a 10 or 15 percent royalty on sales. However, in most cases, when you publish a journal article you receive no royalty on sales; in most cases you must give your copyright to the publisher, which then holds it in perpetuity. I recently had a faculty colleague tell me that he was refused permission by a journal publisher to post his own article on his own World Wide Web home page. Likewise, I have been told that authors must seek permission to place their own published articles on library reserve for their own classes and may have to pay copyright royalties to be able to do so. Something has got to change.

5.0 Paper Unbound

"An inkstain lifts off the page and takes flight."
Octavio Paz, "Inks and Transfers"

For those of you who may still be committed to the paper journal, despair not at the vision that I put forth. The advent of electronic scholarly communication does not preclude you or a librarian from pressing the print button on your (or the library's) personal computer, nor does it prevent you or a librarian from binding what you print and placing it on a shelf to allay concerns about convenience of browsing or archival availability.

A new, noncommercial, electronic-based model of scholarly

communication can embrace the four pillars of scholarly communication. Dissemination would be as wide as the Internet and much more timely than is currently the case. The integrity of contributions can be assured just as they are now by any of several peer-review options prior to acceptance and publication/posting. [18]

With the potential for dissemination greater by magnitudes, the opportunity for recognition and the achievement of prominence is greatly heightened; and subscription price would not be a basis for deprivation. Even in poorer universities around the world, it is far more likely that computers and connectivity will be available than it is that libraries will have budgets to buy narrowly focused, albeit important, journals. The potential for accrual of recognition to authors should be greater because more readers have access to, rather than subscribe to, any single journal. As for the matter of reward, the degree to which faculty are rewarded for publication in electronic venues is a matter that is entirely in the hands of faculty.

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Furthermore, electronic scholarly communication has the potential, using hypertext links, to be considerably more dynamic than text and graphics on paper. In the electronic journal article it will be possible to augment text and the static chart, table, graph, illustration, or photograph with video and audio.

Consider how much more enlightening or compelling our communications would be if with a click of the mouse you could: while reading an article about T. S. Eliot's poetry have an audio presentation of him reading from "The Wasteland"; or, when reading an article about the legislative process, click to see and hear a short video/audio clip illustrating a slick parliamentary maneuver at a committee hearing; or, while reading an article on the mating habits of crickets, click to see and hear ritual mating song and dance; or, be able to click on a footnote and immediately be linked to the full text of the article being cited. The technology exists; we are able to do these things now.

Remember, however, that medium is only half of the equation. Technology alone will do little to solve the overall problem of scholarly communication if it is not linked to economic reform. As I mentioned earlier, there are some commercially-produced e-journals that currently exist that are far from cheap. The economic framework of a new model will govern who can afford access.

The electronic medium will only give greater accessibility if the current commercial model is abandoned for a model that permits all students, faculty, and researchers access if they have a personal computer, telecommunications connectivity, equipment, and software available to them. The physical limitations of paper are indeed an impediment to access, but the single greatest impediment to access to scholarly communication, whether it be via paper or the Internet, is price.

6.0 What To Do?

Doctors, heal yourselves! We, as academics, have contributed

mightily to the creation of the current problems of scholarly communication--glut, cumbersomeness, and costliness. It is incumbent upon us to cure what is ailing us. In your perpetual jousts with campus administrations you seek empowerment; in this matter you are empowered.

There are many things that you as faculty can do to facilitate the major academic cultural shift that is necessary if we are to enter a period of transition that will lead to a new model of electronic scholarly communication.

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Engage the topic at professional meetings--in formal presentations, panel discussions, and in the hallways and bars. Forcefully advocate the transformation of existing, prestigious association- or society-sponsored paper journals to solely electronic format. Discourage profit-based scholarly communication in any format. Protest the creation of new paper-based journals; if they are created, do not contribute to them. Send your scholarly work to electronic noncommercial venues as a matter of preference and encourage colleagues to do the same.

Insist that university, college, and department review, promotion, and tenure policies not only accept peer-reviewed electronic venues but actually prefer them in view of their many advantages. Ensure that there be no less reward for publication in electronic venues; if this is not accomplished, our own conservative academic culture will prove to be the most significant impediment to a shift to a new paradigm of scholarly communication. Familiarize yourself with electronic journals that now exist in your field (beware, some of them may be mirror or companion versions of paper, commercially published journals and be as or more expensive than their paper counterparts); take a look at them, and if appropriate, cite articles appearing in them in your own work. Act.

7.0 Some Thoughts in Closing

Although printing has for three centuries been an agent of change in scholarly communication, we should remain mindful that the central values of scholarly communication--serial communication, the preservation of data, public disclosure, and feedback from informed readers to authors or editors--predated the first learned journals; so, too, can they post-date the paper paradigm. [19] The journal as we have known it was successful because it was the best technology available to do the job. This is no longer the case.

Paper-based journals are no longer expedient because there is now a more effective and efficient technology than printing by which to communicate among the extended scholarly community. The attitude of the journal publishing industry, for the most part, is reminiscent of that of the railroads of the early twentieth century--an arrogance and self-deceit that could not fathom that it was not the railroad business in which they were engaged but rather the transportation business. Today's journal publishers are in the publishing business but mistakenly think that this is the same thing as scholarly communication. Scholarly communication is not and should not be a business; to the extent

that it must be, it should be the business of faculty and students.

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We all are destined to be agents, in one way or another, in this very significant and inevitable process of change. We get to decide whether we shall manifest ourselves as leaders, followers, or victims. Be a leader. Contribute to noncommercial scholarly peer-reviewed electronic venues. Be an advocate within your department, on your campus, and at professional meetings. If an electronic journal does not exist for your discipline or field, help create one.

Notes

1. This paper originally appeared under the same title in The Montana Professor 7 (Spring 1997): 11-14.
2. Vannevar Bush, "As We May Think," The Atlantic Monthly 176 (July 1945): 101.
3. Robin P. Peek and Gregory B. Newby, eds., Scholarly Publishing: The Electronic Frontier (Cambridge, MA: MIT Press, 1996). The essays in this volume, which were presented at a 1993 conference in Winnipeg, discuss many of the points raised in this essay and quite competently contextualize the problem from various viewpoints.
4. Alan Singleton, "Electronic Journals for Everyone?", Physics World (November 1993): 27.
5. Thomas S. Kuhn, The Structure of Scientific Revolutions, 2nd ed. (Chicago: University of Chicago Press, 1970), 112.
6. Ibid., 85-86.
7. Ibid., 20.
8. Ibid., 151.
9. Ibid., 84.
10. Ibid., 92.
11. Ibid., 157-158.
12. Ibid., 84-85.
13. Ibid., 90.
14. Ibid., 85.
15. Ibid., 153.
16. Ibid., 18.

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17. Larry Hurtado, "A Consortium for Refereed Electronic Journals," in Peek and Newby, eds., Scholarly Publishing, 210-13.

18. Stevan Harnad, "Implementing Peer Review on the Net: Scientific Quality Control in Scholarly Electronic Journals" in Peek and Newby, eds., 103-18. This article is also available at <URL:http://cogsci.soton.ac.uk/harnad/Papers/Harnad/harnad96.peer.review.html>.

19. Kuhn, 462.

For a selection of articles and presentations representing the continuing discussion about electronic scholarly publishing see also Current Topics of Interest at MSU (Montana State University) <URL:http://www.lib.montana.edu/ARCHIVE/bullboard.html#Electronic>.

To get an excellent sense of the economics of scholarly journals as they have affected libraries since 1990 see the Newsletter on Serials Pricing Issues at: <URL:http://www.lib.unc.edu/prices>.

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