1997

Back to the Future: At Last Librarians Chart a New Course in Scholarly Electronic Publishing

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**Recommended Citation**  
DOI: [http://dx.doi.org/10.7771/2380-176X.2934](http://dx.doi.org/10.7771/2380-176X.2934)

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Back to the Future: At Last Librarians Chart a New Course in Scholarly Electronic Publishing

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The number of electronic journals and newsletters has more than doubled since last year and has multiplied by over 15 times since 1991 (per the Directory of Electronic Journals, Newsletters, and Academic Discussion Lists (1996), Available: http://arli.cni.org/scomm/edir/index.html [1997, August 13]. Initially, librarians were optimistic that e-journals would ease the runaway serials inflation evidenced in print journals. This relief has not yet occurred, though some librarians are still hopeful. Further, librarians raged that scholars were signing away their copyrights to commercial publishers who then gouged libraries for journal subscriptions to those same scholarly works. Much discussion ensued, and librarians concluded that the cycle must be broken.

HighWire Press, an enterprise unit of Stanford University Libraries and Academic Information Resources, is charting new waters as a co-publisher of low-cost, graphically-rich Internet editions of University and scholarly society e-journals. HighWire Press works with its partners to publish, distribute, and archive e-journals. It provides a common user interface to its titles and hypertext links to related Web sources. The goal of HighWire Press is to "return responsibility for scholarly publishing to those committed to the primacy of scholarly communication rather than profit taking."

An in-depth interview with Michael A. Keller (University Librarian: Director of Academic Information Resources; Publisher of HighWire Press at Stanford University) follows in which he provides insightful, thought-provoking answers to questions involving his role and HighWire's mission, as well as its uniqueness, impact on the market, customer base, competition, partners, and the future.

1. What is HighWire and what is its mission?

MK: HighWire Press is an enterprise unit of the Stanford University Libraries and Academic Information Resources. Lately we have been describing its mission as both church and state: on the church side HighWire's mission is to enhance scholarly communication by making use of information technologies and global networks; on the state side, HighWire's mission is to affect the marketplace of scholarly reports, typically in the form of journal articles and scholarly monographs. A fuller exposition of these is available at the HighWire Press Web-site <http://highwire.stanford.edu/about.shtml>.

2. How did you arrive at the name?

MK: After John Sack had begun work as the Associate Publisher and Director of the as-yet-unnamed press in the Spring of 1995, he gave me 3 possible names and asked which I liked. HighWire Press was the one we selected because it conveys dual and complementary meanings, those of a press whose works are distributed by wires and of an enterprise involving risk.

3. How long have you been at HighWire? How has your past experience molded your present interests in electronic publishing? Describe your transition from musician to electronic publisher: evolution or revolution or continuity?

MK: As the founder of HighWire, I have been with it from the beginning. Before even an embryonic form, during my interviews at Stanford, then Vice-Provost and Dean for the Libraries and Academic Information Resources, Bob Street, proposed to me as a candidate and firm director of the new library services. I proposed what the future would be like for the University Libraries and the University of New Mexico.
network publishing of the *JBC* was in order AND that Stanford wanted to participate in such an experiment. I formed a study team consisting of Ann Mueller from the Stanford Data Center, Sandy Senti from the Stanford Networking Group, and Michael Newman, newly named Head of Stanford's Biology Library. Their charge was to provide functional specifications and a basic technology plan along with a time and fiscal budget for network publication of the *JBC*. They did a fine job in fairly quick order. Bob Simoni and I then worked for several months with colleagues from the ASBM/EB. Eventually, in January 1995, we agreed to fund jointly the design and development of an Internet edition of the *JBC*. In the middle of all of this, Bob Street returned to his home department, Civil Engineering, leaving me with a new title and some of his former domain; beginning in September of 1994, I was Stanford's first University Librarian (my predecessors had been Directors) and Director of Academic Information Resources, the largest centrally-managed academic computer operation at Stanford. As part of this new responsibility, I was given co-ownership of the Stanford's Distributed Computing and Communications Service, which included another piece of academic computing AND the all important Networking group. This new, combined organization was dubbed SUL/AIR.

With this agreement in hand, I approached John Sack to ask him whether he would like to leave the Stanford Data Center and join SUL/AIR as Associate Publisher and Director of HighWire Press. After due consideration, he agreed and began his brilliant career in network publishing in February 1995. He assembled a team of four full-time staff, a couple of co-opted librarians, Michael Newman and Vicky Reich, and some student employees. By May 1995, the first several issues of the *JBC* were ready and a production scheme with superb through-put was ready in its first form. *JBC* was an instant success as measured in numbers of hits and the satisfaction of its readers as reflected in the feedback messages (All HighWire Press co-publications include a feedback function.) John Sack had begun collaboration during this design and development period with David Lipman, head of the National Center for Biotechnical Information of the National Library of Medicine, the research development arm of the organization responsible for Medline.

In mid-1995, there occurred two events of considerable importance to HighWire's future. First, Jeff Pudewell joined SUL/AIR as Assistant University Librarian for Finance and Administration, whose duties included responsibility for enterprise development. Jeff Pudewell's contribution to HighWire Press and to the publishers for whom HighWire works are in the realms of market analysis and business modeling; he has brought to bear professional and informed skills (he is a librarian as well as a degreed fiscal officer) on the questions of subscriber demographics, as well as the tactics and strategies available to scholarly societies in meeting their own organizational goals. Second, the new editor of *Science Magazine*, Floyd Bloom, a reader of the *JBC*, and Professor of Neurosciences at the Scripps Institute, and his colleagues at the American Associa-

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**"The enhancement of scholarly communication is not simply a function to be performed in North America."**

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tion for the Advancement of Sciences invited me and John Sack to journey to Washington, D.C. to present the JBC and share with them our experiences in bringing up an Internet edition of the journal. By the time lunch was over, we had begun talking about how HighWire and AAAS/Science might work together to bring out an Internet edition of Science magazine.

With the launch of a successful Internet edition of the JBC, the most cited scientific journal in the world according to ISI, and the launch in the fall of 1995 of Science Online, another of the most cited scientific journals with a huge global readership, and one of two predominant science news magazines, HighWire's potential for achieving its missions and helping the scholarly societies with which HighWire has been working was apparent. Other publishers have begun working with HighWire, each with its own desires, styles, business models, and strategies, each an appreciable challenge to HighWire. From the first, we saw that we were successful in prosecuting the church mission of HighWire, that of improving scholarly communication. Lately, as the societies working with HighWire are getting larger shares of authors and readers, we are beginning to see how the next mission might be realized.

The roots of HighWire Press go back to the stimuli of outrageous prices and price increases by the for-profit publishers of scholarship, to experiences with computers and networks beginning literally in my first days as a librarian at SUNY/Buffalo, to early attempts to use the Internet to distribute scholarship in my Yale days, and finally to the superb colleagues, technical resources, and the spirit of entrepreneurship at Stanford University.

A description of the course of a career which began in music and musicology, went through music librarianship to collection development and has landed up in my present set of responsibilities would be tedious. Rather, let me mention a few attributes of my training, education, and experience which have influenced the approaches we have taken here at Stanford and not just in HighWire Press.

As a musician, one is devoted to the piece, to the performance of a work of art. Whether the tuba player has had a fight with his girlfriend or the oboe player has a bad reed, or the violinist is a radical vegetarian with communitarian leanings, the performance of the work is paramount and all the musicians know this. As a musicologist, I received my education from Steve Bonta, Howard Brown, Jim McKinnon, Ed Strainchamps, Jim Coffer, Tom Walker, Jeremy Noble, and David Fuller among many others. These scholars emphasized accuracy and clarity in understanding and reporting on contexts and historical facts, on musical and social structures, on interpretation and criticism. Theirs is a discipline of depth and delicacy and I am sure that the focus on the stuff of scholarship itself, the music, the composers, the schools and sources, rather than upon historiography or the sociology of musicology affected me. As a librarian, I was lucky to be treated as a colleague by the scholars and performers at Cornell and Berkeley. Giles F. Shepherd Jr. and Henk Edelman, among many others on the staff of the Cornell Libraries in the 1970s, showed me how to stay focused on service to scholarship and the centrality of building great collections to support great scholars. Joe Rosenthal and Dorothy Gregor at Berkeley can only be described as heroic figures; they saw and anticipated the transformation of libraries from print-based to the inclusion of digital sources and services. With virtually no support from any superior at Berkeley, they began the transformation in very intelligent ways. Along the way, I had some wonderful experiences with some colleague music librarians, especially those involved with the systematic retrospective conversion of music catalog records began with the Associated Music Libraries Group. And at Yale, I had the pleasure to learn more about collection development from my colleagues in the Bibliography Dept. as well as from the area curators, from Ralph Franklin, the Director of the Beinecke Library, from Penny Abell, the University Librarian, and from the spectacular faculty and students of that wonderful university. In the Yale years, one could see the function of the University Librarian as orchestra conductor, as herder of cats, as campus leader.

4. How does HighWire differ from other E-journal vendor offerings, and how is it better?

MK: It is important to realize that HighWire is NOT presently a vendor of e-journals. HighWire is a co-publisher of scholarly journals with Internet editions, but the subscriptions, including terms and conditions, are declared by the originating publishers. That said, there is not a single model of HighWire journals. Each publisher has different attributes from the others. In general, the e-journals co-published with HighWire feature easy navigation, generous hyper-linking within a title, along with HighWire titles, to Medline and related meta-data sources, superb rendition of graphics and half-tones in varying degrees of resolution, access to information not available in the printed editions, feedback and communications possibilities to connect readers to editors and readers to authors, and superior design work so that the realization of the publication in the Internet edition is intuitive and easy to read and to use in scholarship. Readers of HighWire's journals are delighted also with the availability of HTML and PDF versions of articles. This combination of forms satisfies those who wish to scan an article online and then print it in page form as well as those who wish to print the page form and read it. Publishers working with HighWire have realized that attempting to restrict access to the content or the ability to copy and print it once a subscription has been placed is counter-productive to their primary goal, that of scholarly communication.

6. It appears HighWire has moved from an experimental model to a production model. Can this model be replicated on other campuses?

MK: From the first, HighWire Press was intended to be a long-term enterprise. JBC and Science magazine were in prototypical forms in their first Internet incarnations, but HighWire was always intended to become a significant feature of the scholarly publishing landscape. In order to do this, however, HighWire’s team must take into account and sometimes lead the LT and networking marketplaces. So, the actual technology at work has evolved based on opportunities and demands. We believe in and can see several Internet years in one chronological year. Scholarly publishers work with HighWire precisely because we can offer both a distinguished track record as well as a record of responsiveness to their needs along with leadership in adapting and adopting and adapting and adapting new technologies to scholarly network publishing. To do so in a true production environment, one in which we now are processing about 2,000 page equivalents each week for on-time, high quality publications, is remarkable. We believe we can scale our

The greatest library book thief of this century was Stephen Blumberg of Ottumwa, Iowa. Over a 20-year period, he stole some 23,600 books weighing over nineteen tons and valued at $20 million from libraries in forty-five states, the District of Columbia, and two Canadian provinces. Found guilty of theft, he served five years and eleven months in prison and was fined $200,000.

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What are you doing about it?

MK: HighWire has gotten a lot of praise, though that which we appreciate the most comes from readers who do not know our work, but make use of it anyway. We know of cases where parents and relatives of sick persons learned of a course of therapy as a result of searching journals co-published by HighWire and succeeded in improv-

“The enhancement of scholarly communication is not simply a function to be performed in North America.”

ing the treatment of diseases and conditions because of the functions we provide for searching and navigation. We are gratified to learn about scholars whose work is made easier and more complete by the use of journals brought to the Web by HighWire. We are delighted to get more challenges and opportunities from our co-publishers, thinking especially of our friends at Science magazine and JBC, for new functions and new modes of communication. Readers from formerly disadvantaged venues, those who would have received the paper journals weeks after publication, let us know that even across difficult network connections, the investment of minutes for downloading is to them a bearable price to pay for real-time access to fast-breaking science. I guess also that the fact that we are now regularly getting a million hits per day on articles co-published with HighWire is also something of an compliment.

On the other side, we have heard from readers who are disappointed with the terms of subscriptions; our response to this is to refer them to the originating publishers who set those terms. We fairly often hear from people with problems which turn out to be technical ones. Often readers do not read our suggestions for optimizing their browser. There are a bunch of problems which turn out to be networking problems. Our European readers, for instance, know that they must read HighWire journals before 2:30 PM their time, because when Internet users in the Eastern time zone of North America turn on their network connections, response and waiting times increase dramatically. To address this latter problem, we have begun serving such remote locations through dedicated bandwidth to a few remote sites around the world. More such sites will appear in the next months. Extensive research and testing has indicated to us that this solution is far preferable to that of mirror-siting, especially when considering the complexity of our technical architec-

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tured. For each of our journals using this global Internet distribution service, there is a special address arrived at by hyper-linking from the journal home page. A reader merely adds that location to his or her list of bookmarks and is conducted directly by Digital Island, the service provider, to our servers here at Stanford, leaping over numerous problems of the public networks.

10. What is the main obstacle between libraries and electronic publishers? What do you think libraries/librarians want concerning electronic publishing? (Quality product, stable archive, reasonable pricing?) How will HighWire benefit libraries?

MK: Our perspective as a library as well as a co-publisher is that pricing and archiving are the principal concerns. It is a shame, in a way, that other concerns are not as actively considered. The importance or impact of the content, for instance, should be of paramount concern. Why libraries and their consortia are so anxious to acquire access to low impact scholarship for more money than was asked for the print editions is beyond me. Another issue should be design and hyper-linking to remote information resources. However, back to pricing and archiving. So far, with some few exceptions, and those misunderstood, pricing models for Internet editions have been based on preserving the cost recovery (and in the case of for-profit publishers, the profit margin as well) of the print run as well as the Internet publication costs for scholarly journals. We should begin to see and to appreciate models which deliver lower costs for Internet editions. The question of who is responsible for the digital archive of a particular publication is partly a technical and management problem, and partly a sociological one. We as Internet publishers need to offer archival versions and/or services upon which libraries can rely. To date, most librarians want computer-output microfilm as the archival version of the Internet editions we co-publish. Go figure. Given agreement with our co-publishers, HighWire is ready to place magnetic versions in escrow, to prepare CD-ROM versions, and to commit to long-term storage and access here at Stanford. The sociological questions involve the library community's making wise decisions about providing this function which in the print world was quite obviously a by-product of the collection development policies and practices of each institution. We now have to depend more distinctly upon certain libraries functioning as digital archives; most libraries simply do not have the technical capacity to perform in this way. Facing and dealing with this reality is apparently a difficult thing, especially for a number of libraries who consider themselves research libraries and who have archives. One hopes that we do not lose too much content before the social questions are settled. The technical and managerial ones are much easier.

HighWire Press has and will benefit libraries by strengthening the role of the publishers of low cost, high impact reports of scholarship. Over time, we expect that their success, that is their success in scholarly communication among readers and authors, will produce meaningful results for libraries in what and how content is made accessible to academic readers as much as in reduced costs or at least lowered rates of increase of cost. For these results to be realized in their fullest forms, other factors outside of our control, but clearly influenced by the publication of high impact journals online, must change — for instance, more readers to have good network connections, good enough workstations or network computers, adequate training and support for their information technology. Another example of a desired change is the acceptability of the networked version of these journals to the exception of the printed versions.

“... attempting to restrict access to the content or the ability to copy and print ... is counter-productive to [the goal] of scholarly communication.”

11. Who do you consider to be your primary customer; the Association/publisher, libraries, the end-user or other?

MK: Speaking as the Publisher of HighWire Press, our primary customers are the societies and publishers with which we work. Speaking as the University Librarian at Stanford, our primary customers are Stanford's faculty and students, our readers in general. Speaking as an officer of Stanford, we at the Stanford Libraries and HighWire are seeking to perform a couple of missions which address all readers of scholarly publications everywhere. There is not a simple answer to the question, but essentially if we do good work with and for HighWire's co-publishers, we will have done well for the authors and readers of scholarship.

As HighWire's design and development process involves, among other factors, the engagement of readers, we are involving at least representatives of the population of readers in the creation of the Internet editions.

12. Who do you consider to be HighWire’s primary competition? In its entrepreneurial role, how will university-based HighWire continue to compete with the deep pockets of commercial publishers?

MK: At one level, HighWire essentially seems not have any competition. There are alternate suppliers of services and added content, but none of them are comparable to HighWire in some ways. We seem to be competing quite effectively with commercial publishers the way things have been going. I cannot see any way in which commercial publishers can compete effectively with HighWire as is the scholarly and society publishers as well as university-based publishing organs which we seek to empower. It is with that group that there is serious competition and we at HighWire seek to improve and alter the basis of the competition. Essentially the battle has already been decided in favor of the scholarly and society publishers in STM on the basis of content; most of the content readers want is published by not-for-profit publishers. Now we have to help resolve the battle at the economic level. Since deep pockets are not the essential or defining difference between HighWire and the commercial publishers, we believe that we can continue to affect the market correction mentioned earlier.

13. What do you see as the future of HighWire and electronic publishing in general; 1-2 years, 5 years and 10 years? What related or evolving products and/or services do you anticipate spinning-off from HighWire?

MK: In the next few years, HighWire will continue to help bring significant journals to the Internet in digital editions. HighWire has received support from the Mellon Foundation and from Stanford's...
president, Gerhard Casper, to create an Internet publishing capacity for scholarly monographs, working closely with the Stanford University Press, whose director is Norris Pope. Within a couple of years, we expect to have several dozen monographs available. We hope also to have co-published within a few years some reference works as well. In each of these genres, those of the scholarly monograph and reference works, we expect to apply the lessons learned and to provide the functionality provided in the journals co-published with HighWire as well as some new ones.

We have worked with our colleagues at Science, especially Ellis Rubinestein and Monica Bradford, in addition to Floyd Bloom, on something we are calling knowledge environments, virtual libraries and content and services for narrowly defined realms of specific disciplines. Such knowledge environments may be useful in policy and advocacy professions as well. In the policy and advocacy realms, in addition to our colleagues at Science, we are working with Chuck Savitt and his colleagues at the Island Press, a distinguished not-for-profit environmental publisher. These and other information products deriving from HighWire and from SUL/AIR’s experiences are contemplated.

14. The Harrassowitz and HighWire homepages mention a partnership. Please explain. What do you see as the role of the subscription agent in the future?

MK: Harrassowitz and HighWire have entered into a limited partnership. Friedemann Weigel and his colleague directors of Harrassowitz along with Joan Griffith, responsible for Harrassowitz’s Internet presence, are serving as representatives of HighWire’s Internet publishing services to European publishers, obviously seeking to establish relationships with scholarly societies and other publishers similar to the ones now working with HighWire. Harrassowitz will also serve as the European help desk for readers of HighWire journals, a first point of contact and assistance. There is every possibility that the limited relationship with Harrassowitz will become larger, perhaps with the establishment of a design/development and production operation in Wiesbaden and perhaps with some responsibilities for marketing and subscriber support.

The role of the subscription agent in an age in which the Internet editions predominate over the print editions of journals is questionable. We have dealt with subscribers for only a few of the HighWire journals, but have noticed the number of interactions necessary to open a campus to a subscription; there is room for re-engineering there, reducing the number of players and making the interactions much more mechanical. There is clearly a role for some kind of consolidating agency, however, and given the predictable growth of computer memory capacity with predictably lowered costs per unit of memory as well as with the improvement in software design and operation, it is completely possible and, indeed, highly desirable, that some subscription agencies assume more responsibilities even while the number of links in the chain of scholarly communication is reduced.

15. What other partners are involved with HighWire? What will those partnerships mean to us as librarians?

MK: Griffith University in Brisbane, Australia has a similar role to that of Harrassowitz and has already negotiated for the CAUL Libraries in Australia what amounts to a national site license for JBC in addition to having begun the role of representing HighWire’s publishing services to Australian publishers. We fully expect a similar relationship with our colleagues at UNAM. As it has been my contention that we in North America could address the crisis in foreign acquisition by stimulating Internet publication in the countries of origin, we have been encouraged by these relationships to think that readers everywhere might benefit from the improved distribution of foreign source material and commentary through the Internet. The enhancement of scholarly communication is not simply a function to be performed in North America. Internet publishing in numerous sites can have significant benefits to our readers.

16. What is your storage capacity for archival data now and for the future? How will libraries negotiate long-term access?

MK: Our storage capacity for archival data is essentially unlimited for the moment and for the future. The main question here is the management of the transition from one storage medium to another and from one data format to another as these technologies evolve over time. As we get consensus on data archiving in the library and I.T. communities, we will have greater assurance of the long-term survivability of sources in digital form. As the publishers working with HighWire are every bit as concerned as librarians and readers are with the development and acceptance of long-term data archiving, we believe that the negotiations will occur with the same degree of acceptance as consensus is reached on method. Librarians should be negotiating now so that the subscriptions and licenses preserve the right of access to the Internet editions for the years the subscriptions were in force.

17. Please comment on the document formats i.e. HTML, SGML, PDF etc. being used now and what direction is HighWire heading?

MK: HTML and PDF formats are in use and available to readers in most of the HighWire journals. Underlying these formats are SGML versions in very systematic form. Because the browsers currently support fewer characters than STM journals employ and because there are graphics and half-tones included with the texts, gifs are employed as well. We believe that these document formats will persist and we intend to keep using them, hoping, however, that the browsers will expand the number of supported characters. We have been working on the problem of mathematical equations, but have not yet solved that problem. We currently present them as images, but seek to make them searchable. Versions of Tex are a possible approach, but there are technical implications and limitations involved with Tex as well.

18. How many mirrored sites will be added: international and US. How does the Digital Island arrangement figure into this?

MK: Because of the overhead and technical difficulties with mirror-siting as a technique, we have resolved upon the use of a global Internet distribution service rather than establishing mirror sites. We can see, however, the possibility of sister sites, in Wiesbaden with Harrassowitz, in Brisbane at Griffiths University, and perhaps in Mexico City, each with its own particular array of content. Digital Island gives us readers superior access to the journals by dedicated bandwidth and very low latency. As the number of local relay sites provided by Digital Island increases, we believe that many of our remote readers will see substantial improvement in the delivery times of articles in the HighWire journals.

19. What are your thoughts about per-use fees rather than annual subscription fees to full-text resources?

MK: I have mixed feelings about per-use fees. On the one hand, as librarians we make capital investments in information not just for the current populations of readers in our insti-

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Popular report options include: items selected but not yet ordered, recently shipped items, approval plan activity report sorted by fund code. Reports can be created, viewed online and printed or (if too long) attached to emails. For collection development purposes, records display global title histories showing how many customers received the book on approval, compared to customers who received only notification slips for that title.

GOBIlink, used in conjunction with GOBI, can create bibliographic and order records in a local library system from orders entered into GOBI, eliminating the need to re-key item-by-item. Libraries can download data which will trigger encumbrance, order, receipt and payment transactions in the local library system.

For cataloging support, GOBIlink can facilitate the overlay of order-level records with cataloging records directly from YBP or through OCLC PromptCat. GOBI ordering screens provide space for libraries to communicate local data to be included in the cataloging fields. YBP is beta-testing shelf-ready materials for libraries with call numbers provided by OCLC via PromptCat.

Available since January 1996, GOBI continues to evolve and a list of enhancement ideas appear on the Website. A picture of GOBI (bird) and imaginative description also appears on the Website, adding a sense of humor to the electronic environment.

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them, causing all sorts of troubles. and yet, it is in the future where our greatest leverage is. We can't change the past, although if we are smart, we learn from it. ... If we learn to anticipate the future better, we need not fear it. In fact, we can welcome it, embrace it, prepare for its coming, because most of it will be the direct outgrowth of our own efforts.  "  (p. 18).

The proponents of the Yale classical curriculum were able to hide behind its historical legitimacy. Are we hiding behind the historical legitimacy of print research? Me?

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utions, but for future generations as well. Thus, expending capital on information as though it were merely a utility is onerous. On the other hand, if reliance on per-use fees for low impact information allows more selective capital investments in high impact information, then my instincts as a collections person might be satisfied. The expansion of reliance on per-use fees might accelerate the market correction we at HighWire are involved with as well.

20. After two years into the project what has surprised you? Any profound lessons? Have your goals changed?

MK: The enthusiasm for the online versions by readers has surprised us. The warmth and strength of our relationships with the co-publishers has been a wonderful surprise. The examples of the JBC and Science have been mentioned only and are quite pervasive ones, but the other relationships with the other publishers have been wonderful and quite productive as well. The most profound lesson to date is that HighWire demonstrates what a small, but brilliant band of professionals can do to affect change given the focus on the mission, on satisfying authors, editors, readers, publishers using information technology. Our goals have not changed, though our methods and technologies have.

21. Would you like to add anything?

MK: I can promise only that the future will bring as many opportunities and changes as the recent past. Not only HighWire, but Stanford in general seeks to exploit the opportunities to the advantage of its academic community and for the colleague communities elsewhere. Get more information about HighWire at http://highwire.stanford.edu/.

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