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ABSTRACT

This paper discusses problems related to library collection of science materials from developing regions, including price increases leading to cancellation of peripheral titles. The importance of access and preservation of such materials is noted. The International Federation of Library Associations and Institutions (IFLA) Science Research Materials Project (SRMP) initiative to make accessible and to preserve the scientific and technical materials of developing nations is then described, including the following elements of SRMP's proposed cooperative solution: a larger pool of acquisitions funds; an environmentally controlled collection archive for access and preservation; an enhanced ability to build and maintain local collections; a widely accessible electronic and traditional delivery mechanism; an expanded opportunity to seek grants and endowments; and a framework to foster cooperative projects. SRMP members are listed. (MES)

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Collecting Science Materials from Developing Regions: Universal Dilemma, Collaborative Solutions

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Paper

As Science turns, so does the world. In the United States it is considered axiomatic that the advancement of basic science is relevant to the nation's welfare. Whether we like it or not, the Western World is a technological society, one highly dependent on science and its handmaiden, technology. Whether Science is good or bad is moot; what is not debatable is that it has changed significantly the world in which we live, and that it is likely to continue to do so for the foreseeable future. It has even challenged the basic tenets of some religions; for some even replacing the need for religion, causing Albert Einstein to caution that "Science without religion is lame, religion without science is blind."

As the world confronts the transformation to the Information Age, it is already obvious that Science will once again "spin off" technologies that will have both desired and undesirable effects. The Industrial Age, in which Science amplified muscle power through the inventions of wondrous machines, also left a legacy of environmental degradation and worldwide pollution. While forecasters easily predicted the train, plane and automobile, who could have predicted the traffic jam, the multiple vehicle collisions, the polluted air, our very cities being built around the car (the machine that kills and maims annually more people than all of the wars!)?

The Information Age, spawned largely by the advent of computers that could manipulate mountains of raw data and amplify the power of brains in a manner similar to the Industrial Age's amplification of muscles, has changed the world even more dramatically than the machines of the Industrial Age. With the introduction of the commercial microcomputer less than twenty years ago and the subsequent growth of the Internet, the worldwide exchange of

information has burgeoned to the point that we are, indeed, both "drowning in a sea of information" and "drinking from an information fire hose."

The worldwide glut of "information and knowledge currently doubles every year and is expected to double every 73 days by the year 2020."[1] Like the unforeseen consequences of the proliferation of the automobile, what are the consequences of a world smothered in inaccessible information? in unauthenticated information?

One of the consequences is the improper storage and inevitable deterioration and loss of much information, including information about Science itself. Whatever your philosophical position is on Science and Technology, not to mention the Information Age, I suspect that you would not want the history of science to be lost because we failed to collect, store and preserve its materials. But in much of the world, including the Western World, the scientific record is not only being shunted aside, its longevity is also being compromised by inadequate storage. In the rush to keep up with the unrelenting production of scientific knowledge and the costs associated with it, we are now at that point where very few institutions have the financial resources to store and preserve the vast amounts of information that the Science-Technical-Medical (STM) field is currently generating. In astronomy, for example, hundreds of thousands of computer-generated charts and documents are piling up, unread, and in peril of being lost or destroyed because there is no money to spend on proper storage facilities. The information cup runneth over!

While we are all too familiar with the exorbitant price increases over the past two decades for purchasing STM materials (most libraries are paying more and getting less for their acquisitions expenditures), it bears repeating that "increases in STM journal prices have been responsible for fueling the 147 percent increase in STM journals from 1986 to 1996."[2] And, "during the same decade, as a result of library budgets not keeping up with such increases, 7 percent fewer journals and 21 percent fewer monographs were acquired on average across North America's 100 largest research libraries."[3] The cost of scientific subscriptions to "journal and serial titles alone is now stated to be "seven times more than that of arts and humanities titles and twice as much as social science titles."[4] This crisis in scholarly communication shows no sign of slowing and has had the pernicious effect over the past decade of decimating science collections to the point that the fortunate are holding steady while most are declining in their ability to offer credible support for scientific research. All the while, the number of STM publications available worldwide continues to increase.

Even though there have been heroic efforts to salvage at least a core STM collection from the numerous cycles of "review and cancel" strategies (dictated by years of insufficient funding), the collection money in science libraries has migrated to the "for-profit publishers" for high-demand titles, which are increasingly English language journals reporting work done in the United States and Western Europe. Predictably, the end results have been not only more homogeneous collections nationwide but also a continuing loss of the peripheral and unique materials that so often are the hallmark of an excellent research library.

Nonetheless, long-held titles have been canceled and receipt reduced to only one or two libraries-and, in some instances, to no holding library at all! Peripheral titles canceled are often in other languages or from other regions; though generally not costly, such titles, if canceled in sufficient number, yield enough money to retain subscriptions to core titles. And that, in a nutshell, is what has happened to U.S. academic science collections: they have been pared to the commercial core, but at the loss of a considerable number of peripheral titles that often narrow the scientific inquiry.

Because a title is considered "peripheral" to a core collection, however, does not mean that it is not a valuable publication, or that it should not be held at all. On the contrary, many so-called scientific peripheral titles, especially from the developing nations, are of the utmost value. In certain areas of science, the developing nations are the only ones addressing certain scientific issues. Because the results of science have so many social, political and economic

ramifications it is of the utmost importance to the global village that a dialogue involving all the participants be encouraged and recorded. Paraphrasing the great English Poet, John Milton, "Science, like Virtue, must sully itself in Reality and walk unfettered among the Truths of Inquiry." In something as important to the world body as science and its technological outcomes, national concepts of superior science are to be avoided, if at all possible.

Also, many disciplines of science are based on the ability to examine as many aspects of the problem as is possible. For example, in the area of bio-diversity any lack of information about the animal and plant species on this planet (or others) makes understanding the "balance of nature" incomplete, and potentially dangerous when the inevitable technological or biological "tweaking" of the environment becomes involved.

And research in many scientific disciplines, like the earth sciences, requires an incredibly diverse array of materials from as many areas of the world as is possible. Many of these areas are remote, sometimes inaccessible due to political problems, or are regions that have been seldom studied at all. In these instances, the only available information comes from relatively obscure, peripheral sources. This material may be absolutely critical not only for those studying the area directly, but also to scientists needing analogs from around the world or seeking global correlations. So it is essential that scientific publications be international in scope to balance the various biases of the individual countries.

It is equally important that retrospective holdings for these peripheral titles be retained, somewhere, as well. After all, since science is always building on what was done before, it is valuable to save the historical infrastructure. And, one could argue that these titles are important so that not only former paths of research can be traced but also (hopefully) that they might lead forward in different directions.

Adding to the fiscal problems regarding scientific research, as if the situation was not already calamitous enough, most research libraries are spending nearly one-third less on preservation than they did just a few years ago. And, "Total preservation staff [at the 115 Association of Research Libraries] has sharply declined to 1,742 FTEs [Full Time Equivalents] in 1996-97 from 1,879 in 1995-96, falling back to the staffing levels reported in 1989-90."[5] One of the reasons given for this decline is the withdrawal of grant funding.

It is quite clear to all but the most myopic that the traditional concept of a library is no longer valid, that no one library, be it Harvard or the Library of Congress, can conceivably collect all the information now being generated-let alone guarantee its preservation. Is not one of the central reasons for libraries that they would be repositories and archives of the historical record?

One of the possible ways to ameliorate some of this dilemma is accelerated resource sharing and preservation, but it must be effective resource sharing; otherwise it will only result in the "expeditious pooling of poverty," which is the unfortunate result of too many consortia. Since the Center for Research Libraries (CRL) has operated similar programs in the past fifty years to assist librarians, bibliographers and researchers to join together to do what they could not easily do, or do at all, regarding access and preservation of peripheral materials, we wondered if the crisis facing the collecting of STM materials might be eased by applying cooperative lessons learned from the past.

In a serendipitous moment at last year's IFLA meeting in Amsterdam, two of the participants in the present Science Research Materials Project (SRMP) initiative met for the first time and struck a conversation that became the impetus for the development of a plan to make accessible and to preserve the scientific and technical materials of the developing nations. Building on its already extensive holdings in these areas (holding over 4,000 current subscriptions to such materials and retrospective holdings of over 10,000 journals), CRL brought together science librarians (see list below) from various scientific disciplines to form a Working Group.

The SRMP Working Group was charged with a thorough examination of CRL's present STM holdings, and asked to rationalize its collecting policies both to promote concerted cooperative collections of these materials at the national/international level, and to establish a desiderata list of STM titles recommended for immediate preservation. Recognizing that the cost of STM materials has created a crisis for research libraries attempting to sustain credible core collections, and that competent research is not only being impaired but also that the very history of the scientific enterprise is being lost, CRL proposed a cooperative approach that includes both the centralized CRL facility and the distributed collections of the SRMP participants (who do not have to be CRL members in order to belong to the SRMP).

Utilizing such a collaborative strategy the international community has an opportunity to address a significant collecting and preservation problem regarding STM materials. Whether a title is central or peripheral to a science collection, it requires staff time to acquire and otherwise process; in fact, it could be argued that peripheral titles generally involve more-than-average effort to acquire and although they are not usually expensive per title, because of the staff time involved, they can actually be quite costly to an individual institution to acquire. In short, much of the scientific record is at risk of being lost not just from natural and human disasters but from simple attrition of efforts to gather and retain copies in sufficient numbers in various sites.

The cooperative solution proposed by the creation of the SRMP would benefit science librarians and scholars in the scientific disciplines through:

- A larger pool of acquisitions funds to support rarely held scientific materials generated by scholarly societies and related publishers from around the world.
- An environmentally controlled collection archive for access and preservation.
- An enhanced ability to build and maintain local collections with the assurance that complementary, rarely held materials in a safe, secure print and/or electronic archive would be readily accessible to its local clientele.
- A widely accessible electronic and traditional delivery mechanism.
- An expanded opportunity to seek grants and endowments to collect and preserve unique scientific information.
- A framework, complementary to efforts such as ARL's SPARC, for librarians and scholars to foster cooperative projects to lower costs involved in expanding the availability of science and technology publications.

Initially, SRMP activities will be limited to the collection and preservation of unique science materials, especially serials, in the following disciplines: biology, physics, agriculture, astronomy, chemistry, environmental studies, geo-sciences, mathematics, and physics. Later, more scientific disciplines will be added.

As mentioned earlier, its planning and implementation would incorporate the substantial holdings of CRL's journal collections. From this core collection, SRMP would progress to build collaboratively an international conspectus of collecting agreements for the preservation and access of rarely-held, unique science materials. Participating institutions would integrate their local collection development policies with the one to be engineered by SRMP.

The SRMP Working Group will initiate a general discussion among science librarians, interested scholars and researchers nationwide on the perceived areas of need and the scope of the project. The Working Group will then draft a project program statement, initiate work plans, and issue a general invitation to participation.

The SRMP will aggressively seek external funds from granting agencies and endowments/contributions from relevant donors, commercial vendors, and publishers to undertake its work and to increase acquisitions and preservation programs. Based on CRL's highly successful Area Studies Microform Project (AMP) model, the SRMP will develop

operational bylaws and a coordinated project work plan, including alternative funding models to defray administrative and access costs to the expanded STM holdings at CRL. The CRL Vice President for Collection Programs, or designated Program Officer, will be a permanent ex officio member and CRL liaison.

Currently, the CRL SRMP Working Group consists of the following librarians and institutions:

Ross Atkinson
Deputy University Librarian
Cornell University Library
Ithaca, NY

Linda Musser
Head Earth & Mineral Sciences Library
Pennsylvania State University
University Park, PA

Bonita Perry
Assistant Director for Research and Collections
Smithsonian Institution Libraries

Lucy Rowland
Head, Science Collections & Branch Services
University of Georgia
Athens, GA

Susan Starr
Associate University Librarian
University of California-San Diego

David Stern
Director of Science Libraries & Information Services
Yale University
New Haven, CN

Gary Wiggins
Head, Chemistry Library
Indiana University
Bloomington, IN

Patricia Yocum, Chair
Coordinator for Collections
Shapiro Science Library
University of Michigan
Ann Arbor, MI

Kathleen Zar
Science Librarian
John Crerar Library
University of Chicago

While the SRMP is just getting started, we believe that it will provide a collaborative forum to address some of the major fiscal difficulties confronting the collecting of STM materials. And we would like to take this opportunity, at this international conference, to invite those of you who share our problems and concerns to contact us by way of the SRMP web site http://wwwcrl.uchicago.edu, which is mounted on the CRL server, to explore ways of

extending this concept to the international community. If we work together, we may be able to not only preserve and access the historical record concerning science, but perhaps even influence the costs of acquiring this material. Your voice in this matter would be most welcome.

ENDNOTES

1 Bosseau, Don L. and Martin, Susan K. "VISIONS: Where Are We Now? Some Thoughts about Expansionism," in The Journal of Academic Librarianship, V. 24, no. 5 (September 1998), 390.

2 Keller, Michael A. "Science, Scholarship, and Internet Publishing: The Highwire Story," in Content, V. 6, no. 2 (Fall 1998), 12.

3 Ibid.

4 Burnam, Paul D. "Private Liberal Arts Colleges and the Costs of Scientific Journals: A Perennial Dilemma," in College & Research Libraries, V. 59, no. 5 (September 1998), 406.

5 Kyrillidou, Martha, O'Connor, Michael, and Blixrud, Julia C., eds., ARL Preservation Statistics 1996-97 (Washington, D.C.: Association of Research Libraries, 1998), p. 6.

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