

Welcome to Library and Information Science

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This paper enacts the following scenario: At an orientation session for a library and information science (LIS) program an educator gives incoming students a brief address entitled “Welcome to Library and Information Science.” Three versions of that talk are offered here, drawn from seminal works by Shera (1973a), White (1992), and Bates (1999). In turn, each author is introduced, the historical and literary context of the article is noted, and then its unique characterization of LIS is presented in a spoken rhetorical style. The three disquisitions are followed by discussion questions designed to engage newcomers and observations on the pedagogical strengths and weaknesses of each paper. A conclusion crystallizes each work’s conception of library and information science as a unified domain. Readers will benefit from succinct refreshers in these foundational writings and learn new communication and teaching strategies.

Keywords: library and information science, intellectual history, disciplinary identity, Jesse H. Shera, Howard D. White, Marcia J. Bates

Introduction

A debate has been simmering over the past several years concerning the status of library science and information science paradigms within the broad realm of information studies. Gorman (2004) and Crowley (2008) assert that the information science perspective has eclipsed its library counterpart, to the detriment of the discipline and profession. Bonnici, Subramanian, and Burnett (2009) apply a sociological theory of disciplinary change to information studies and conclude that an emerging “iField” has absorbed the library-oriented sensibility. On a more upbeat note, Dillon and Norris (2005) argue that such controversy marks the entire history of LIS and that the current era is one of unprecedented growth that can benefit all stakeholders.

The paper at hand does not engage these arguments about disciplinary identity and status directly. Instead, it revisits compelling visions of LIS as articulated by distinguished contributors in landmark publications. One objective is to remind all parties involved in the debates of interpretations

of LIS that are unifying rather than divisive. Another goal is to provide educators with resources, drawn from a rich literature, to welcome newcomers to the field during a period of change.

There are many excellent definitional statements about information studies and several are shown in Table 1. Due to space limitations criteria were applied to select three as the focus. Each featured paper was required to address the nature of LIS as a whole and in an introductory writing style. The format of a journal article or book chapter was favored, which is an appropriate genre to assign to students. Preference was given to a strong, original theme. The author had to be an accomplished researcher and educator of LIS with a substantial publication record. The three chosen works are Jesse H. Shera’s “Toward a Theory of Librarianship and Information Science” (1973a), Howard D. White’s “External Memory” (1992), and Marcia J. Bates’ “The Invisible Substrate of Information Science” (1999).

The research process involved a close reading of the three featured papers. In ad-

Table 1: A Sample of Introductory Writings.

Year	Title	Format	Author(s)
1933	An Introduction to Library Science	textbook	Pierce Butler
1962	An Introduction to Library Science: An Attempt	journal article	Masanobu Fujikawa
1968	Information Science: What Is It?	journal article	Harold Borko
1973	*Toward a Theory of Librarianship and Information Science	book chapter and lecture	Jesse H. Shera
1983	The Development of Library and Information Science: Disciplinary Differentiation, Competition and Convergence	book chapter	W. Boyd Rayward
1992	*External Memory	book chapter	Howard D. White
1994	Library and Information Science: Its Content and Scope	journal article	Pertti Vakkari
1999	Information Science	journal article	Tefko Saracevic
1999	*The Invisible Substrate of Information Science	journal article	Marcia J. Bates
2010	Foundations of Library and Information Science (3rd edition)	textbook	Richard Rubin
2007	Conceptions of Information Science	journal article	Chaim Zins
2007	Fundamentals of Information Studies: Understanding Information and Its Environment (2nd edition)	textbook	June Lester and Wallace C. Koehler Jr.
2010	Library and Information Science	encyclopedia article	Leigh S. Estabrook

Note. These writings provide introductions to library science, information science, library and information science, or information studies. They are listed in chronological order by date of publication. Complete citations are in available in the bibliography. The three articles featured in this paper are marked with an asterisk (*).

dition, related writings from the authors' oeuvre and critical commentary on their work were considered, when available. The amount of critical commentary on the three papers varied. Since Shera's death in 1982 there has been considerable critical analysis from other scholars. Differently, White and Bates are still active contributors and their work has not been similarly subject to review. However, the work of White and Bates is further illuminated by their own published personal reflections in the forms of a memoir (Bates, 2004), speeches (Bates, 2005; White, 2002), and sundry writings (Engle, 2002; McCain, 2005; White, 2005).

The outcome of the research appears below, addressing the articles sequentially by date of publication. Each section begins with a brief introduction to the writer and the historical and literary context for the work. Then, a succinct synthesis of 500 words is drawn from the paper and pre-

sented in the voice of an educator who is addressing newcomers to LIS at an orientation event. Every disquisition is followed by discussion questions for use in a classroom setting and observations on the pedagogical strengths and weaknesses of the article. A conclusion crystallizes each work's conception of library and information science as a unified domain.

Featured Paper #1: Toward a Theory of Librarianship and Information Science (1973a) by Jesse H. Shera

Jesse H. Shera (1903–1982, Ohio) received a master's degree in English language and literature from Yale University in 1927, had professional stints as a bibliographer and researcher for non-profit and governmental agencies, and then earned a PhD in library science from the University of Chicago in 1944. His dissertation was an historical study of the origins of

the public library movement in New England (Shera, 1952). A polymath, he went on to become his generation's preeminent teacher, researcher, educational administrator, technologist, historian, theorist, and ambassador of LIS. Shera was an early innovator of automated information retrieval systems yet believed that technology is only one tool for enhancing the success of libraries (Wright, 1985). In his lifetime he championed humanistic and sociological perspectives on librarianship and sought to link LIS to other academic disciplines and intellectual movements by articulating a cogent theoretical foundation. In his memory a popular mailing list within LIS is called *JESSE*.

"Toward a Theory of Librarianship and Information Science" (Shera, 1973a) appears in a collection of Shera's essays, *Knowing Books and Men, Knowing Computers, Too* (1973b). It was originally presented as a public lecture on November 1, 1972, at the Center for the Study of Democratic Institutions (CSDI) in Santa Barbara, California, a now defunct liberal think tank. Shera's address restates the major themes of his career to an audience likely composed of left-leaning intellectuals and engaged citizens from outside the information domain. The talk proposes a theoretical foundation for LIS in the form of a new academic discipline named *social epistemology*, originally conceived by Shera's colleague Margaret Egan (in "'A Brilliant Mind': Margaret Egan and Social Epistemology," Furner [2004] carefully and persuasively traces the origination

of the concept of social epistemology to Margaret Egan [1905–1959], Shera's colleague at the Graduate Library School of the University of Chicago).

Social epistemology was previously defined as "the study of those processes by which society as a whole seeks to achieve a perceptive or understanding relation to the total environment—physical, psychological, and intellectual" (Egan & Shera, 1952, p. 132). After outlining the tenets of social epistemology he discusses the role of information technology, bibliography, and subject expertise within librarianship, among other topics shown in Table 2. Inspired by Shera's essay, an educator at an LIS orientation program might say:

Welcome to library and information science.

Libraries were created centuries ago as archives of the state and to protect precious printed materials for the use of an elite class. More recently they have broadened their scope and become cornerstones of education and entertainment for citizens of democratic societies. At all times, the library has been a social enterprise that embodies the attitudes, values, and goals of the culture it serves. Its basic mission is to manage graphic records, that is, the written transcript of all that society knows about itself and its world.

The proper theoretical framework for librarianship is 'social epistemology.' In philosophy, epistemology is the study of how an individual comes to know some-

Table 2: Section Headings of "Toward a Theory of Librarianship and Information Science" (Shera, 1973a).

The Problem of the Individual
Social Epistemology
Social Epistemology, Information Science and the Library
The Librarian and the Machine
The Flight from Bibliography
The Pattern of the Future and its Meaning for the Librarian's Professional Education
The Burden of the Library

thing. In contrast, social epistemology concerns the ways in which society as a whole becomes knowledgeable. Social epistemology focuses on the production, flow, integration, and consumption of communicated thought across the social fabric. Drawing upon an understanding of social epistemology, library collections, systems, and services can be designed to conform as closely as possible to the process of knowledge production and use in society.

To this end, the work of librarianship is fundamentally bibliographic, that is, it entails bringing graphic records and users together into an intellectually rewarding relationship. Practically speaking, bibliographic work is composed of three elements: 1.) the acquisition of materials; 2.) their organization, and 3.) the provision of services to users. These functions should not be separated into departments or roles but instead be seen as an integrated whole. Ideally, librarians perform these three core capabilities in dedicated areas where they are subject experts. An understanding of the history, literature, culture and work practices of a subject domain is required to fully meet a patron's needs. Put another way, a librarian is not just a librarian, he or she is a librarian of something.

Social epistemology and the bibliographic work of librarianship are interdisciplinary pursuits that draw from the humanities, social sciences, and physical sciences. One complementary domain of critical importance is information science. The field of information science explores the properties, behavior, and flow of information and spearheads the design of information retrieval systems for managing graphic records. Computers are rightly becoming increasingly important and central to the success of libraries. An enchantment with the machine must not obscure the fact that librarianship is fundamentally a social and humanistic enterprise.

Egan's concept of social epistemology, as championed in the 1973 address

by Shera, is probably intriguing to newcomers and invites discussion. Students can be asked: Is there a social counterpart to individual knowledge? If so, is an understanding of social knowledge the ideal theoretical framework for the information professions? Another compelling issue is that many initiates arrive to LIS programs with substantial expertise in a subject area and with hopes to leverage that expertise; others do not and anticipate careers as generalists. Shera takes a strong stand in favour of subject knowledge (to be opposed by Bates, shortly). Students can react to the idea of being "not just a librarian [but] . . . a librarian of something" (Shera, 1973a, p. 103) and diverse opinions may generate lively classroom debate.

This article has significant strengths and weaknesses as a touchstone and assigned reading. On the positive side, Shera is a master writer and orator and the vision of social epistemology remains compelling today. Furner (2002) has said, ". . . [Shera's] was one of the most successful of efforts to define the theoretical foundations of library and information science . . ." (p. 6). On the negative side this piece shows signs of age. Some people may be put off by the persistent use of masculine pronouns; the windy political rhetoric; or the dated pronouncements on technology. It is also problematic that social epistemology (Fuller, 1988) has since coalesced into an interdiscipline outside of LIS (Zandonade, 2004). Following Shera's death and independent of the literature of LIS, a group of philosophers began to study the collective nature of knowledge under the banner of social epistemology. This effort was spearheaded by Steve Fuller and is chronicled in the article "Social Epistemology from Jesse Shera to Steve Fuller" by Zandonade (2004). Educators wishing to use the paper can find *Knowing Books and Knowing Men, Knowing Computers, Too* (Shera, 1973b) in most university libraries, and an audio file of Shera's original lecture is available at the CSDI archive, now housed at the University of California, Santa Barbara.

Featured Paper #2: External Memory by Howard D. White (1989)

Howard D. White (b. 1936–, Utah) received his doctorate from the School of Librarianship at the University of California, Berkeley in 1974. At this place and time the study of information was rooted in systems theory, cybernetics, linguistic theory, and other multidisciplinary ideas that orient to the dynamic patterns underlying phenomena (Bates, 2004). There, he was also influenced by advisor and mentor Patrick Wilson, an eminent philosopher of information and a library theorist (Wilson, 1977). A self-described book lover with a literary sensibility, White possesses high technical skills and is a pioneering bibliometrician, specifically in co-citation analysis. His interests are wide-ranging and include research into science data archives, reference service and tools, online searching, and various library issues. He is perhaps best known for the journal article “Visualizing a Discipline: An Author Co-citation Analysis of Information Science, 1972–1995” (1998), with Katherine McCain, which offers a birds-eye view of the

major research specialties and contributors in the recent history of information science and won the Best *JASIS&T* Paper of the Year Award. To acknowledge White’s significant contributions to information studies, in 1993 he received the ASIS&T Research Award and in 2004 the ASIS&T Award of Merit; he was also awarded the Derek Price Medal in 2005 for his contributions to scientometrics. White is an ardent popularizer of library and information studies (White, 1999) and to that end often employs in his writing a conversational tone, witty neologisms, and entertaining leaps to popular culture.

“External Memory” is the concluding chapter in *For Information Specialists*, a collection of essays that altogether aim “to arrive at a general understanding of the tools, processes, and social contexts of information work” (White, 1992, p. 2). The full title of this edited book is *For Information Specialists: Interpretations of Reference and Bibliographic Work*. The project was instigated by White, who serves as editor and contributor along with co-authors Marcia J. Bates and Patrick Wilson. The collection displays a coherent per-

Table 3: Section Headings of “External Memory” (White, 1992).

Introduction
A Theme for Information Studies
Remembering World 3
Why “External Memory”?
The Word “Information”
Information Systems vs. Library and Information Science
Access
Library Science, Information Science, Librarianship
Information Specialists and External Memory
Information Studies, Tracy and Hepburn
Sizes and the Resnikoff-Dolby Scale
Information Specialists and Reduction of Overload
Customers and the Reduction of Overload
A Partitioning Scheme
The View from Anyone’s Office
Current vs. Archival Records
Four Interrelated Disciplines
Conclusion

spective on LIS originating from Wilson, the senior scholar and teacher of the other two at the University of California, Berkeley in the late 1960s and early 1970s. It is White's effort at a "unifying concept, both for the book and for the field" (p. 5). He proposes that library and information science is concerned with *external memory*, that is, "the creation, organization and use of messages or performances stored in durable media other than the memories of living persons" (p. 250). External memory is a complement to *internal memory* that is foremost the concern of other social sciences such as cognitive psychology. With these concepts as a starting point, White elaborates upon the nature of information work, the relationship between LIS and cognate disciplines, and other topics listed in Table 3. Using "External Memory" as a point of departure, an educator at an LIS orientation program might say:

Welcome to library and information science.

Human beings generate a superabundance of memories that overflow the capacity of their minds. When these impressions are expressed and stored outside the brain they form a stock of knowledge that can be called 'external memory'. A fundamental problem for society is how to keep this knowledge from being lost. Library and information science is a discipline and profession dedicated to collecting, organizing, and providing access to external memory so that living and future generations can benefit from it.

External memory takes the material form of artifacts that we call records. Records may consist of text, sound, or pictures and pertain to all aspects of the human experience, whether work, academia, or entertainment. Records can be true and accurate, such as an atlas or autobiography; or fantastical and fictional, such as a novel or poem. Library and information science is mainly concerned with records that enter

society through the institution of publishing, indeed, it is more precise to say our work is centered on publications than on the broader term 'information.'

There are two approaches for providing access to external memory as embodied in publications and records. 'Intellectual access' involves identifying and organizing materials based on its features such as subject, author, genre, or language. To this end we apply the techniques of indexing, classification, and cataloguing. 'Physical access' entails the placement of publications on library shelves or in information systems and then managing these collections with ethical, political, and budgetary sensitivity. Both intellectual and physical access are required to mediate the relationship between individuals and external memory.

The people attracted to careers in library and information science are a special type. Most citizens prefer to be surrounded by a small number of publications and any more produces the discomfort of 'information overload.' Differently, information professionals are at ease when surrounded by vast information collections. Further, information professionals have an uncommon fund of 'intellectual sympathy,' that is, a great willingness to invoke the contents of external memory at the requests of other persons. Our forte and pleasure is reducing information overload for ourselves and others.

Library and information science is not the sole enterprise concerned with external memory; a constellation of disciplines and professions share the territory, each with its own mandate. Information systems focuses on external memory in the context of organizations with a primary concern for unpublished records that have a short lifespan, such as financial data. Archival science is likewise centered on organizations and manages unpublished records of lasting value, such as company documents.

Mass communications also engages external memory and orients to media and its impact on audiences. Altogether the fields and professions involved with external memory form a broad enterprise that Jesse Shera called social epistemology.

In 1992, White's invocation of 'memory' as the *raison d'être* of library and information science was innovative. Since then the concept has become a popular interdisciplinary research area in its own right. A focus on memory may surprise those who associate LIS with "information" or artifacts such as books and documents. To explore these perspectives, students can be asked: Do you consider the library to be a memory institution, an information institution, or something else? Initiates to the field might appreciate White's insights about the special abilities of information professionals. Other avenues for discussion pertain to students' reflections on their own perceived talents, experiences of information overload, and propensities for "intellectual sympathy" (White, 1992, p. 268).

The pedagogical strengths of this article include White's conversational manner and references to popular culture, including an extended discussion of a classic film as an expression of information work styles. A weakness of "External Memory" (White, 1992) is its sheer length (54 pages) that may overwhelm a newcomer; indeed, in the introduction White proffers that *For Information Specialists* may function best as a resource for educators. Other challenges to the use of this essay in the classroom are its references to earlier sections of the book and its somewhat idiosyncratic organization (as reflected in the section headings in Table 3). Still, of the three articles reviewed here, White's contains, in my opinion, the greatest number of imagination-grabbing conceptions of LIS. Those wishing to use it can obtain *For Information Specialists* in any university library or via online booksellers.

Featured Paper #3: *The Invisible Substrate of Information Science* by Marcia J. Bates (1999)

Marcia Bates (b. 1942—Indiana) received a master's degree in library science in 1967 and then a doctorate from the School of Librarianship at the University of California, Berkeley in 1972. There, she was exposed to the same multidisciplinary perspective on the emerging field of information studies as her peer Howard D. White. Her early focus was on library systems analysis with a sensitivity to the user's perspective and she helped to establish the research specialty of information seeking behavior. Bates' career in LIS includes important contributions to the areas of information system search strategy, user-centered design of information retrieval systems, and the organization of knowledge. Visually and conceptually striking models and a rigorous yet colloquial writing style are hallmarks of her work. Bates is the recipient of many professional commendations (Bates, 2005) and is a "canonical" information science author (White & McCain, 1995) responsible for three of the 20 most highly cited library and information science papers of all time.

"The Invisible Substrate of Information Science" (Bates, 1999) or "Invisible Substrate" (for short) appeared in a special double issue of the *Journal of the American Society for Information Science and Technology* to mark the 50th anniversary of the publication in 1999, alongside other papers on the history and foundations of the field. It describes information science as a paradigm in a Kuhnian sense that she models as having 'above the water line' and 'below the water line' characteristics. The former features are familiar in the definition of the field as, "the study of the gathering, organizing, storing, retrieving, and dissemination of information" (p. 1044). Her objective in the paper, as reflected in the outline in Table 4, is to illuminate for initiates the more ambiguous *invisible substrate* of information science

that “lurks below the water line, largely unconscious and unarticulated” (p. 1043). Using “Invisible Substrate” as a springboard, an educator at an LIS orientation program might say:

Welcome to library and information science.

You are entering an academic discipline that is uniquely located in the university. We are not a discipline in a conventional sense, but rather a meta-discipline that cuts across other fields. Library and information science focuses on the knowledge that is produced by all other academic and popular domains and then facilitates its dissemination to society.

This enterprise entails a certain mental framework focused on the representation, organization and structure of information. An ‘information perspective’ is not innate but is learned during the first months of education or training. Some of the tools for this work are databases, metadata, indexes, catalogues, and thesauri. Our expertise with information is often invisible to outsiders and challenging to explain to family and friends. While there are differences between the ‘library’ and ‘information’

sides of our community, we share this special outlook and primary concern for information representation, organization, and structure.

Library and information science can be compared to acting. Great actors represent the key features of human personalities so that they are meaningful to an audience. Similarly, we represent the critical features of information collections for people to access and use. Just as well trained actors do not require lived experience of the roles they portray in order to convey them powerfully, we do not need deep knowledge of a topic to represent it to others. While some familiarity with a subject may be helpful, it is not the crux of the matter—strong expertise in information is what counts.

At the heart of library and information science are three big questions. There is a physical question: What are the features and laws of the recorded information universe? There is a social question: How do people relate to seek, or use information? And there is a design question: How can access to recorded information be made most rapid and effective? To answer these questions, we draw from the social sci-

Table 4: Section Headings of “The Invisible Substrate of Information Science” (Bates, 1999).

Introduction
Paradigm Above the Water Line
Paradigm Below the Water Line
<i>The Meta-Field of Information Science</i>
<i>The Content of Form</i>
<i>Being and Representing</i>
<i>Subject Expertise</i>
<i>Librarianship and Information Science</i>
<i>Information Science Theory</i>
<i>Information Science’s Universe</i>
<i>Information Science’s Big Questions</i>
<i>Methodological Substrate</i>
<i>Values</i>
Conclusion

ences and engineering sciences and a wide variety of research methods and professional practices. Multi-talented personalities who are comfortable with information, people, and technology tend to thrive here.

Deeply held values guide this enterprise and are one point of difference between information science and librarianship. When focused on the design of information systems to access collections, we aim for an objective neutrality in order to serve users in an egalitarian manner. Differently, librarianship entails a stronger sense of public service and empowerment and champions social justice, especially for populations perceived as marginalized.

The idea of the ‘invisible substrate’ of LIS may ring true for many students who have faced (and perhaps fumbled) the daunting task of explaining their career choice to family and friends. In my own classes lively discussions have ensued when people share their stories of such attempts. Perhaps the most creative and controversial point of this article is Bates’ use of acting as a metaphor for information work and her associated stance against the need for subject expertise (in direct opposition to Shera, who favors strong domain knowledge). A class could discuss: Is library and information science similar to acting? Or, put another way: What is the role of subject expertise in library and information science?

As a teaching tool, “Invisible Substrate” (Bates, 1999) has many winning qualities; it is right-sized and organized into logically related subtopics, as shown in Table 4. Bates’ friendly and direct style makes a welcoming impression. There are jokes embedded in the article (concerning the mysterious Lewellyn C. Puppybreath) to pique students’ curiosity. And, LIS cohorts are predominantly made up of women who may appreciate Bates as a female authority and role model; educators can refer admirers to her feminist statements elsewhere in the literature (Bates, 2004,

2005). A potential shortcoming of “Invisible Substrate” is its favoritism of an information science perspective that could leave those partial to librarianship cold. The article is accessible through electronic journal subscriptions of most university libraries and also available in full text on Bates’ personal academic website.

Conclusion

This paper imagined how an educator might welcome incoming students to a library and information science program, utilizing ideas from papers by Shera (1973a), White (1992), and Bates (1999). After a profile of the author, the historical and literary context of each article was sketched, and then its unique characterization of LIS was presented in a spoken rhetorical style. The objective of this exercise was to revisit interpretations of LIS that are unifying rather than divisive. Another goal was to provide educators with resources to initiate newcomers to the field during a period of change. To conclude and summarize, the holistic visions from the featured articles are crystallized below.

- Shera (1973a) introduces social epistemology, that is, the way society becomes knowledgeable; libraries contribute to the production of knowledge in society by making graphic records available to all, drawing upon subject expertise and the technical innovations of information science.
- White (1992) casts the accumulated record of human experience as external memory. A constellation of fields and professions (LIS, information systems, archives, mass communications) each play an indispensable role in connecting society to its external memory.
- Bates (1999) illuminates the special meta-perspective shared by information science and librarianship; both focus on the representation, organization, and structure of information in all domains of life.

This paper also proposed questions to stimulate classroom discussion and stated pedagogical strengths and weaknesses of the three articles. From the analysis it can be gleaned that people attracted to information professions are variously subject experts (or not), tolerant of information overload, intellectually sympathetic, service-oriented, and equipped with a special meta-perspective. Explicit knowledge of these tendencies may help newcomers settle into their academic and professional careers. Of note, the scholars who produced these landmark articles have traits in common, as well. Jesse H. Shera, Howard D. White, and Marcia J. Bates are technologically savvy social scientists with humanistic sensibilities, a breadth and balance of talents that inspires.

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References

- Bates, M. J. (1999). The Invisible substrate of information science. *Journal of the American Society for Information Science*, 50(12), 1043–1050.
- Bates, M. J. (2004). Information science at the University of California at Berkeley in the 1960s: A Memoir of student days. *Library Trends*, 52(4), 683–702.
- Bates, M. J. (2005). Acceptance speech for ASIST Award of Merit. Retrieved from <http://gseis.ucla.edu/faculty/bates/articles/Acceptance.html>
- Bonnici, L. J., Subramanian, M. M., & Burnett, K. (2009). Everything old is new again: The evolution of library and information science from LIS to iField. *Journal of Education for Library and Information Science*, 50(4), 263–274.
- Borko, H. (1968). Information science: What is it? *American Documentation*, (January), 3–5.
- Butler, L. P. (1933). *An Introduction to library science*. Chicago, IL: University of Chicago Press.
- CDSI. (2011). Center for the Study of Democratic Institutions audio archive. Retrieved from <http://digital.library.ucsb.edu/collections/show/15>
- Crowley, B. (2008). *Renewing professional librarianship: A fundamental rethinking*. Westport, CT: Libraries Unlimited.
- Dillon, A., & Norris, A. (2005). Crying wolf: An examination and reconsideration of the perception of crisis in LIS education. *Journal of Education in Library and Information Science*, 46(4), 280–298.
- Egan, M. E., & Shera, J. H. (1952). Foundations of a theory of bibliography. *Library Quarterly*, 22(2), 125–137.
- Engle, S. (2002). Marcia Bates: A career improving information retrieval systems and educating future archivists, designers, and librarians. *Forum: News from UCLA's Graduate School of Education and Information Studies*, 4(3), 6–7.
- Estabrook, L. (2010). Library and information science. In M. J. Bates & M. N. Maack (Eds.), *Encyclopedia of Library and Information Sciences* (3rd ed., pp. 3287–3292). New York, NY: CRC Press.
- Fujikawa, M. (1962). Introduction to library science: An attempt. *Journal of Education for Librarianship*, 2(3), 144–150.
- Fuller, S. (1988). *Social epistemology*. Bloomington, IN: Indiana University Press.
- Furner, J. (2002). Shera's social epistemology recast as psychological bibliography. *Social Epistemology*, 16(1), 5–22.
- Furner, J. (2004). "A brilliant mind": Margaret Egan and social epistemology. *Library Trends*, 52(4), 792–809.
- Gorman, M. (2004). Whither library education? *New Library World*, 105(9/10), 376–380.
- Lester, J., & Koehler, W. C. (2007). *Fundamentals of information studies: Understanding information and its environment*. New York, NY: Neal-Schuman.
- McCain, K. (2005). Howard D. White: Recipient of the 2005 Derek de Solla Price Award of the journal *Scientometrics*. *Scientometrics*, 65(3), 271–273.
- Rayward, W. B. (1983). The development of library and information science: Disciplinary differentiation, competition and convergence. In F. Machlup & U. Mansfield (Eds.), *The study of information: Interdisciplinary messages* (pp. 343–363). New York, NY: John Wiley and Sons.
- Rubin, R. (2010). *Foundations of library and information science* (3rd ed.). New York, NY: Neal-Schuman.
- Saracevic, T. (1999). Information science. *Journal of the American Society for Information Science*, 50(12), 1051–1063.
- Shera, J. (1952). *Foundations of the public library: The origins of the public library movement in New England, 1629–1855*. Chicago, IL: University of Chicago Press.
- Shera, J. (1973a). Toward a theory of library and information science. In J. H. Shera, *Knowing books*

- and knowing men, knowing computers, too (pp. 93–110). Littleton, CO: Libraries Unlimited.
- Shera, J. (1973b). *Knowing books and knowing men, knowing computers, too*. Littleton, CO: Libraries Unlimited.
- Vakkari, P. (1994). Library and information science: its content and scope. In I. P. Goden (Ed.) *Advances in Librarianship* (Vol. 18, pp. 1–55). San Diego, CA: Academic Press.
- White, H. D. (1992). External memory. In H. D. White, M. J. Bates, & P. Wilson, *For Information specialists; Interpretations of reference and bibliographic work* (pp. 249–294). Norwood, NJ: Ablex.
- White, H. D. (1999). Scientist-poets wanted. *Journal of the American Society for Information Science*, 50(12), 1052–1063.
- White, H.D. (2002). On accepting the ASIST Award of Merit. *Bulletin of the American Society for Information Science and Technology*, 28(2), 10–11.
- White, H. W. (2005). Introducing the Derek de Solla Price Awardees of 2005: Howard White. Balás Schlemmer, Interviewer. *ISSI Newsletter: Quarterly E-Zine of the International Society for Scientometrics and Informetrics*, 1(2), 10–12.
- White, H. D., & McCain, K. W. (1998). Visualizing a discipline: An author co-citation analysis of information science, 1972–1995. *Journal of the American Society for Information Science*, 49(4), 327–355.
- Wilson, P. (1977). *Public knowledge, private ignorance: Toward a library and information policy*. Westport, CT: Greenwood Publishing Group.
- Wright, H. C. (1985). Shera as a bridge between librarianship and information science. *The Journal of Library History*, 20(2), 137–156.
- Zandonade, T. (2004). Social epistemology from Jesse Shera to Steve Fuller. *Library Trends*, 52(4), 810–832.
- Zins, C. (2007). Conceptions of information science. *Journal of the American Society for Information Science and Technology*, 58(3), 335–350.