attack libraries for unappealing presentation of their wares. But if information were truly a commodity, then wouldn't an information-rich MARC record be more valuable than the surface-level description in the Amazon catalog? One might conclude that information is not the commodity in demand here; instead, entertainment is the product for which people are willing to pay, whether it comes in the form of a colorful Internet portal or an animated personal information servant. On the other hand, if Pace is correct about the information economy, then it is reasonable to conclude that libraries stand to gain from its existence, because libraries have always held more information than Internet information brokers. The key is to make digital services sophisticated enough to be commensurate with the strength of the collection. In other words, libraries should try to beat corporate competitors at their own game rather than provide an alternative to the game. Pace paints a bright picture of the library's future business model, but what would be the consequences of adopting business practices in one of the few information institutions that has not succumbed to the lure of capital?

Pace has chosen to take a largely ideological approach to the digital library, and as a result, the book will be helpful to those who are in the beginning stages of planning for a digital library—these ideas are certainly thought-provoking, and often deliberately controversial. The book would be an excellent discussion tool for the classroom as well; even if instructors may not buy into some of the populist ideas, it should rouse enough heated opinions to create a good debate. As far as implementation goes, the book seems well suited to large libraries with the ample resources to try some of his suggestions.

There is a distinct current of conflict running through this book; sometimes the author expresses sympathy with traditional library views, in other places he berates libraries for a staunch snobbery that prevents them from adopting commercial practices. All this makes for a reactionary tone that creates occasional inconsistencies in the author's message. That said, the book will stand out among its peers on the same subject because of its refreshing wit, its forbearance with regard to weighty technical information, and its relative freedom from theoretical speculation.—*John Leslie (jleslie@olemiss.edu), University of Mississippi, Oxford.*

Digital Preservation and Metadata: History, Theory, Practice. By Susan S. Lazinger; annotations by Helen R. Tibbo. Englewood, Colo.: Libraries Unlimited, 2001. 359p. $55 softcover (ISBN: 1-56308-777-4) LC 2001-50390.

We have grown accustomed to "fixity" or the permanence of text in the print world. Now we must adjust to the "malleability" or changeability of electronic information. Susan Lazinger's book discusses why we need to preserve the intellectual integrity of electronic documents.

Lazinger, a professor at the School of Library, Archive, and Information Studies, Hebrew University of Jerusalem, discusses digital preservation as an issue of concern among libraries, companies, organizations, and individuals in contemporary society. She presents methods of safeguarding resources and dealing with obsolescence to responsibilities, methods of preservation, cost, and metadata formats. She provides useful information about national and international institutions that have established frameworks for digital libraries and archives.

The book is divided into two parts, I—Issues and Models, II—Formats, and Standards. Each chapter is divided into numbered sections, which facilitate locating information. An extensive bibliography is provided at the end of each chapter with the exception of chapter 9, which is a descriptive list of associations, organizations, and programs that support cultural heritage initiatives. The complete bibliography and the index follow chapter 9. Lazinger emphasizes the immediate need for organizing and preserving the wealth of information on the Web before it inadvertently disappears.

Chapter 1 is devoted to the reasons digital preservation is such a vital issue. The uncontrolled accumulation of data soon will lead us to useless data because searching is difficult, discouraging, and a process of diminishing returns. Electronic texts can easily be edited, improved, manipulated, and revised. However, they have lost their assurance of "preservability." The medium of the data is at risk and the even larger problem of intellectual preservation increases more and more. Lack of metadata and systems documentation, and electronic data in forms that cannot preserved, are problems. The software or hardware has become obsolete or the digital resources have been designed to prevent any copying. Also, a lack of mechanisms allowing institutions willing to be caretakers of our electronic resources to do so is another serious consequence. All of these jeopardize our digital heritage.

In chapter 2, Lazinger stresses the initial step of identifying material worthy of preservation, whether print or electronic. Digital resources require decisions not only about which items to keep but also about which elements of the resources should be preserved, that is, not only what should be preserved but also how much of each item should be preserved. Features such as links to other documents and interactivity will be lost unless decisions are made to keep them. Intended change or well-meant change may be confused with the unauthorized tampering with data. Digitized material is material convert-

ed to electronic format from documents or other media, while natively digital or born-digital format is material originally created in digital form that can be used as originally intended only if it remains in digital form. Chapter 3 highlights the stakeholders in the preservation process. These include individuals, institutions, and organizations. The unifying factor among stakeholders is their interest in adding to or making use of the value of digital information objects.

Chapter 4 deals with technological obsolescence as the result of the evolution of technology. Another issue is media deterioration. The options fall into three categories—refreshing, migrating, and emulation. Refreshing is copying digital files from one storage medium to another of the same type to prevent media obsolescence. Migration is the periodic transfer of digital materials from one hardware or software configuration to another or from one generation of computer technology to another. It is necessary every time the operating environment is altered and varies with the type of digital data being migrated, although technologies for migration are still in the process of development. There are a number of different strategies for converting digital information, including transferring it from less stable to more stable formats or from a multiplicity of formats to a small number of common formats, developing backward-compatibility paths, and developing process centers for migration and reformatting. Migration is the currently preferred strategy for preserving electronic data. Emulation supposedly is extensible, because no one can predict what changes will occur. It does not require labor-intensive examination or translation of individual documents. Lazinger also touches upon electronic archiving, which includes the authenticity of the digital object (that it is unaltered from the original and is what it purports to be) and copyright (levels of permitted access to the digital object).

Chapter 5 addresses digital archiving, both converting information into digital form and maintaining born-digital information. Estimating the cost of these processes is timely and complex. Chapter 6 moves on to metadata, which refers to any data that aid in the identification, description, and location of networked electronic resources. A primary function of metadata is resource discovery. Metadata increases the odds that a user will be able to retrieve appropriate information and assess its usefulness and availability. It deals with controlling electronic resources as opposed to resource discovery. This is vital in preservation. Metadata in libraries has come to mean a complete record, including encoding, that describes and replaces a larger document or collection in a bibliographic tool. Metadata generally does not refer to records found in paper tools. Lazinger identifies the three-category taxonomy of metadata: descriptive, structural, and administrative. She also describes the five-category taxonomy of metadata: administrative, descriptive, preservation, technical, and use metadata. All of these concepts must be clearly understood before advancing on to the next issue in Lazinger's book.

Chapter 7 discusses standards for structural interoperability, such as framework and wrapper technologies. The purposes of such frameworks and how they can be used with wrapper technologies is touched upon in this chapter. The first half of chapter 8 focuses on cultural heritage digitization projects. Such projects are designed to provide broad access to significant, historical, paper-based materials through the Web. The second half of this chapter looks at data archives that house social science data, especially survey and census data, and more recently, geospatial data. Such centers are another electronic data preservation effort, although they generally house the data that originally were created in machine-readable format and no digitization is necessary to make these materials available to audiences in a networked environment. The beginning of this chapter addresses organizations that are providing a framework for the development of digital libraries. The remainder of the chapter examines organizational, commercial, government, and academic social science data archives. Web addresses are given for them.

In chapter 9, the author briefly explains the reality of the future in international digital cultural heritage centers and electronic data archives. Many nations have initiated digitization projects and programs through their national libraries and archives. Other cultural repositories, including research libraries and museums, are developing their own scanning projects. Although many of these organizations operate primarily within national boundaries, their research and support for digitization best-practice studies extend worldwide.

Lazinger uses technical language throughout the book, and although she gives definitions and explanations of these terms, the user must comprehend each meaning clearly in order to understand the problems concerning digitized information. Each chapter ends with a summary and an explanation of recent developments. The chapter on how to preserve electronic publications will interest many librarians, archivists, administrators, and other related professionals. Preserving electronic publications involves knowing models for syntactic and semantic interoperability and metalanguages and metadata forms.

This text is a useful guide for those involved in the preservation of digital information. It is indispensable in understanding today's methods and practices, intellectual discourse, and preservation guidelines.—*Bernadette Lopez-Fitzsimmons (bernadette.lopez@manhattan.edu), Manhattan College, Riverdale, New York.*