According to Goody, "writing was not essential to the development of the state but of a certain type of state, the bureaucratic one." The technologies of writing changed forever the way in which information was presented, meaning was perceived, and society fashioned. We now seem to be entering a comparable period in which automation seems to be effecting just as profound a sea change revealing many of the characteristics of an emerging neo-orality drawing upon "automated" memories incapable of thought and judgement but of immense range and power. Is the story, which Goody tells, being played backwards from literacy to a modified orality? If so, there may be valuable clues in this book with regard to our future role as archivists and the societal role of the documents in our charge.

Hugh Taylor
Qualicum Beach, BC

Image Storage and Retrieval Systems. MARC R. D'ALLEYRAND. Toronto: McGraw-Hill Book Company, 1989. 246 p. ISBN 0-07-015231-4.

Marc R. D'Alleyrand's *Image Storage and Retrieval Systems* will appeal to archivists for three reasons.

First, this book covers alternative technologies which can be used to make collections more available to clients of archives.

Secondly, D'Alleyrand describes the process used by many organizations implementing imaging systems. Understanding how these systems are designed will help archivists decide if the information in these systems is historically valuable and what information was available to decision makers. Insight into the trends of information system design and implementation will make it easier for archivists to design systems to emulate these environments for clients of the archives. Knowing what information was in a system is not very useful if one doesn't know the context of how that information was used. This book will allow archivists to better understand the context of the use of information they are acquiring by knowing more about information system design.

Thirdly, archivists may be interested in how different information systems evolve from the traditional paper- and microfilm-based systems to the electronic imaging systems now being used in government and the private sector. Why did organizations adopt these systems? The effects can be profound for these organizations — companies or governments can profit significantly or fail miserably when implementing new information systems. These effects themselves will be of interest to future historians researching the beginning of the Information Age. Reading D'Alleyrand's book may be able to help you offer theories as to why particular systems failed or succeeded.

D'Alleyrand describes this book as "a new approach to records management." At first, I could not see what was so new about this book. The book described most of the processes I and many others have followed in designing and implementing systems. However, I realized that the novelty may be in using electronic imaging and not so much the approach. The method proposed for developing systems could be used for any kind of information system. It is quite conventional as compared to Information Engineering and using Computer Assisted Software Engineering tools as a

methodology for developing systems. D'Alleyrand emphasizes process flow as opposed to entity-relationships and data modelling. For archivists who are interested in the study of how information systems are developed, this book is an excellent starting point because the concepts he follows are more commonly used and conventional than some of the newer ways of developing systems.

I found the text easy to read and the explanations simple to understand. The book is broken up into three components. Just as a traditional system design has a flow, this book has a flow. The first section deals with the context and important issues that need to be settled before you become bedazzled by the technology. Questions such as "Why do you wish to automate a function?" or "What is the difference between mechanization and automation?" are answered. Many valuable suggestions are offered in deciding how much information should be stored as image information and how much as index information.

The technology section is a catalogue of devices available today and under development which can be used in designing an image storage and retrieval system. This section will become outdated faster than other parts of the book because of the rapid changes in technology; nevertheless, D'Alleyrand does a good job of explaining how some of these devices work, and has included numerous illustrations and photographs. At the very least, you will come to know what some of the "buzz" words like WORM, Smart Cards, Voice Recognitions, OCR, Touch Screens, and digitization mean. The author also discusses some of the capabilities and problems in using the devices. He wisely avoids describing in detail the technical limitations of some of the devices because this is the area that changes the most in this industry. The only area in this discussion of technology that I found to be misleading is the use of the term "electronic microfilming." I have never seen this expression used by any other author or system manufacturer or anybody else in the industry. D'Alleyrand's definition of electronic microfilming is misleading because he refers to a system for scanning an image and storing it on optical disc. Microfilm is not used in the process. The commonly used term for this process is electronic imaging, digital imaging, or document scanning and the like. His analysis of the advantages and disadvantages of these systems with respect to conventional microfilm systems is valid for most applications. One notable exception occurs when dealing with old, low contrast-records commonly found in archives. Most electronic imaging systems for document storage and retrieval are bit-map systems with one bit per pixel. (If you read the book you will understand the expression.) One bit per pixel cannot be used to represent more than two grey levels, black and white, without reducing the resolution of the information presented (in other words, reducing the legibility). A good microfilm system can represent the equivalent of thirty-two different grey levels at the same resolution as a typical electronic imaging system. An example of the problem occurs with documents that are soiled with both dark and faint writing. The microfilm copy will record all the information, although it will be difficult to read because of the low contrast, but the one-bit-per-pixel electronic imaging system will have either the faint writing or the dark writing obliterated from view. Sometimes an electronic imaging system presents no evidence of the information being there at all. It is for this reason that I have recommended at the National Archives of Canada that we not use these systems for archival records until multiple-bit-per-pixel systems are available which match the effeciency of a microfilm system.

The last section of the book discusses the steps that should be taken to establish the systems. For example, running an existing system in parallel with the new system is suggested. The book provides a very good checklist for things that should be considered if you are about to implement a storage and retrieval system. The chapter on justifying the system, which includes a financial analysis for return on investment, has a private sector orientation. For public sector organizations, "after tax profits" is not a suitable measure of success. However, public sector organizations are increasingly following a business case approach to justifying automation projects and this book shows how some of the analysis can be done. In conclusion, if more organizations followed some of the suggestions in this book there would be more successful imaging systems than there already are.

Philip Sylvain
National Archives of Canada

Optical Digital Image Storage System: Project Report. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION, Archival Research and Evaluation Staff. Washington, D. C.: U.S. Government Printing Office, 1991. (1991-242-334/91104)

This report provides some very valuable insight into the design and construction of an optical disc system intended as a surrogate for microfilm. Many organizations want to know which is the most cost effective way to copy and make available textual records and be assured that the answer is based upon empirical study, not merely spreadsheet models and company brochures. This report answers this question, although not as directly as one would hope.

What were the original objectives of the project and what were the conclusions?

Objective 1: Establish the feasibility, costs, and benefits of converting paper and microform documents to digital optical disc and to assess document input speeds required to accomplish conversion in an operational environment. According to the cost analysis, optical disc is twice as expensive as microfilm. However, nowhere does the report state this directly. The authors of the report conclude:

> From the cost analysis presented in Appendix D, it appears that any conversion of paper records to an alternate form cannot currently be justified purely on the basis of cost alone. However, the ODISS project also identified other intangible benefits, such as improved image legibility, improved timeliness and accuracy of access, an enhanced retrieval capability, reduction of storage space requirements, and reduced or eliminated handling of original documents. A conversion of records to an alternate form may be justifiable on a basis other than reduction of costs. Each case must be decided on its own individual merits.

This system, even if its major shortcomings identified in the report could be overcome, is less efficient for copying textual records than a microfilm system.

A second issue, which is of even greater concern to archivists, is accurately to capture the information in the documents. The report states that ninety-four per cent of the scans on the high speed scanner produce acceptable images and the remaining six per cent are scanned on the low speed scanner to produce an acceptable image. They