Historians, Books, Computers, and the Library

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ABSTRACT

PAST EXAMINATIONS OF THE interactions of librarianship with historical scholarship have noted problems that libraries face in serving historians. This article examines changes in the nature of historical work that have occurred over the last four decades including the advent of computers and electronic texts. The authors examine recent developments—such as electronic publishing, electronic mail, electronic journals, and hypertext databases—and suggest that some of these tools will be of limited use to historians, due to the nature of historical scholarship. While some historians may be reluctant to adopt computer technology, many of them already use computers in writing. Historians' personal computers will be a gateway for new forms of electronic information, as evidenced by the publication of various CD-ROM files of relevance to historians. Other publishing projects in the humanities also offer examples that historians can follow in the use of electronic text and images.

INTRODUCTION

Almost forty years ago, Jesse Shera (1953) published a book that contains points salient still today. The book is an extended essay on history, its origin, practice, and on the methods and research needs of the historian. Shera's goal was to provide the background to educate adequately the librarian whom he had found sadly lacking in understanding of the historical research process while working on

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his historical publication *Foundations of the Public Library.* Shera's seminal book will be used as a starting point to indicate how much computer technology has and has not changed the practice of librarianship and history.

First, imagine the tools commonly used by historians in 1953, the year in which Shera published his book. Electric typewriters were just being developed. Xerography—a technology that has altered historical scholarship even more than the computer—was in its infancy. Bibliographic tools, such as the *National Union Catalog,* existed only on paper. In short, the tools of the historian were hardly different than they had been in decades past—largely paper, pencil, a good memory, and a lot of note taking. Moving ahead thirty-odd years, we find photocopiers in virtually every library and archive, computer-based word processing, and many catalogs and abstracting services—and, indeed, many publications themselves—available in machine-searchable/readable form. Some of the particular tools extolled by Shera have been supplemented or replaced by electronic versions, in the sense that one might well choose to use OCLC, RLIN, or a local union catalog instead of a printed version of the *National Union Catalog.*

Has the writing of history changed? In substance, no. Shera's description of the discipline is as valid today as it was in 1953. Yet, in form and method, the discipline of history is changing in subtle ways due to the introduction of new technologies of storage, processing, and retrieval. Let us first consider how Shera described the field four decades ago.

Shera's book begins by indicating the position of history as a social science and as a "transitional point between the social sciences and humanities," a view perhaps more widely held today than it was at the time he published. The universal human interest in history gave rise to libraries; historians later pressed for the establishment of public libraries "in which they might find the books they needed to pursue their own studies" (Shera, 1953, p. 1). Similarly, Kevin Starr has pointed out in a speech at the 1990 Special Libraries Association conference, that, in the nineteenth century, librarians often were historians and historians had large personal libraries. The association of historians and libraries may be most noticeable in appointments to the position of Librarian of Congress, a post which historians Daniel Boorstin and James Billington have held in recent times.

Shera (1953) defines the task of the historian: "The historian is a general social scientist whose primary concern is with the past. In pursuit of this inquiry the historian may proceed as a political scientist, a sociologist, an economist, a psychologist....In short, the

historian is the sociologist of the past" (pp. 2-3). Shera continues with an exposition on ways in which to classify history: *purpose* (descriptive, evaluative), *subject* (history *of* person, place, thing), *method* (narrative, psychological analysis, statistical analysis). He makes important points in contrasting the "indirect" methods of history with "direct" methods of other social sciences. The historian uses artifacts of the past but cannot ever come into direct contact with or recreate it. This is the place of the library in the work of the historian—the repository of the textual/graphic record (artifacts) of the past. As the historian must examine all of the evidence before presenting a case before his peers, the historian must have access to all of that evidence. To serve the historian, the library must have access to all of that evidence. Primary evidence consists of artifacts: *published text* (including inscriptions, official public records, official private records, newspapers) and *unpublished text* (personal records and correspondence). Secondary sources are important to the historian marshaling his evidence, both to verify that all the primary evidence which is appropriate for his argument has been used and to argue his case in scholarly debate either along similar lines as fellow historians or to dispute their interpretations.

The work of the historian involves the collection of evidence and its selection, organization, analysis, and interpretation. Shera notes that the historian rarely chooses a topic *ab initio;* his environment often has pressed it upon him—from reading, colleagues, previous projects. From that beginning, each historian tackles the topic in an individual fashion. Ideally, the first step is a review of all of the outstanding literature. Here the structures of the historical discipline are most helpful—bibliographies, journals, books, directories, library catalogs—in determining the scope of the question and previous attempts at addressing it. The historian, simply by dint of the task, picks and chooses phenomena to emphasize, though he does not accord this its central role in the practice of history. Peter Uva (1977) outlines a five stage process of historical research: (1) problem selection (involving preliminary work and hypotheses), (2) detailed planning of data collection, (3) data collection, (4) analysis and interpretation of data, and (5) presentation of findings (p. 16). He notes that stages overlap and some work may be simultaneous, as does Orbach (1984, 1991) in her exploration of the historian's research process. Orbach (1991) also notes that the end product intended, time frame available, as well as amount of material available, play a role in the process, and that at a certain point further materials are not used as the shape of the narrative has been formed and anything more would be an overload (pp. 34-35). Charles Tilly (1990), provided his answer to "How (and what) are historians doing?" His article provides a historian's

perspective (albeit colored by sociology) on historical evidence. For Tilly, at least, the historian and the evidence he uses is less important than the intellectual task of writing.

In contrast with this sympathy of aims and goals through mutual activity (historians as librarians, librarians as historians), both fields have become specialized and professionalized. Historical scholarship slowly became professionalized and developed a pattern and methodology. Shera (1953) points out that it was not until after 1800 that history was separated from other academic disciplines, and only in the late 1800s was the professorate formed in the United States along the lines of the German model (p. 87). History became an academic career, including a credentialing process of producing and defending a dissertation. Associations dedicated to historians were formed, most notably the American Historical Association in 1884, and the Mississippi Valley Historical Association (now the Organization of American Historians) in 1907. Librarians developed a similar credentialing process and cluster of professional organizations. The demands of each profession make it harder to be both a librarian and a historian. Computer technology has widened the gaps between them as well. The historian and the library may work at cross-purposes—the historian may fail to take fullest advantage of the resources available, and the library may fail to serve the historian to the fullest extent possible. Indeed, the irrelevance of some library tools to historical (and other humanistic) scholarship has been featured in several recent studies (Gould, 1988; Wiberley, 1991).

Therefore, both history and librarianship call into play issues of professionalization and technology. The historian is driven by the need to carve a unique niche, with the dissertation and then with articles and books, in the pursuit of a professional (and typically academic) career. This exploration in depth drives the historian beyond the resources of his home library to other libraries and archives or to use of interlibrary loan. As an individualistic pursuit, this also militates against extensive use of that technology which is cooperative and generalizable. The historian has less to gain by adopting those information technologies which the library might use to provide greater access to materials—i.e., electronic mail, electronic file transfer, and digital storage of text and images, and trial applications in the sciences and perhaps even in the humanities at large. While technophobia is an individual trait, not readily generalizable to the practitioners of a discipline, the practice of history itself is an impediment to the adoption of new technology.

Often the historian uses not just a text but its *context* which may include everything from the era in which the document was written to the paper on which it was written and the ink used. This

need for contextual evidence gibes uneasily with the decontextualizing effects of digitization (similar to the reduction of context in microfilmed materials). Having materials digitized might indeed provide greater access to the intellectual content and could allow the user to select the appropriate materials quicker but cannot obviate the need to see the actual document. The expense of providing this secondary indexing capacity is difficult to justify for the use of the individual scholar. Popular materials may indeed be rehoused in this format, but it is often unique materials the historian is after, has the hardest time accessing, and is least willing to share. Historians are not monolithic in their adoption (or nonadoption) of computer technology, just as they are not monolithic in methodology or ideology. Indeed, those historians whose methods are more social scientific and data-oriented are more likely to adopt computers to manipulate that data (e.g., see Burton & Finnegan, 1989).

Serving this gamut of historians means devoting more resources to old and new technologies—books, periodicals, computers, CD-ROM, online catalogs, and electronic mail. The library acts as a conduit for information about available resources and as a means of access to nonlocal materials. New technologies, applied appropriately, can help.

The relationship between library and historian and computer technology offers opportunities. Glancing at the table of contents of *Reference Sources In History* (Fritze et al., 1990), one can see the resources which the library provides to the historian currently and probably shall forever. Bibliographies, book review indexes, periodical guides, periodical indexes and abstracts, newspaper indexes and newspapers, dissertations and theses, government publications, biographical sources, geographical sources, historic statistical sources, archival, manuscript, and special collections are all resources too great in scope, too specialized, or simply beyond the ordinary needs of an individual. These secondary and primary resources are what the library can provide the historian. Some resources used by historians in their research have been, can, or should be made available electronically. The card catalog has all but been replaced by the online catalog (a more flexible tool, though less browseable) which can be dialed up and consulted off site.

As an ever-greater number of historians are exposed to the technological changes that have affected the scholarly publishing industry during recent years, it would benefit us to consider what the future may bring to publishing in history. To do this we will examine recent developments in publishing, experiences in other fields with electronic communication, and the issues raised of particular relevance and importance to historians.

Varieties of Electronic Publishing

It was not so long ago that the word *publishing* could mean only one thing: the application of ink to paper and the subsequent manufacture and distribution of the books and journals so produced. However, during the past decade, both the methods and meaning of publishing have become blurred—there is no longer such an enterprise distinct from the industries of computing, telecommunications, and, yes, even broadcasting. This blurring of boundaries, of techniques and audiences, is assumed by the term *electronic publishing.*

Electronic publishing refers to the distribution of information in machine-readable form. As such, it can appear in a bewildering variety of form and content—as a document on magnetic disk produced on a personal computer by word processing software; as a historical simulation on a microcomputer; as a machine-readable encyclopedia on a CD-ROM disk (an optical medium similar to that used for audio compact disks); as journal article abstracts over phone wires from a remote database; as an electronic bulletin board for the exchange of scholarly letters and manuscripts; or as an online catalog of book citations found in a university library. Other authors (e.g., Seiler & Raben, 1981; Gibbins, 1984) have offered somewhat narrow definitions of electronic publishing. However, for the purposes of this discussion, electronic publishing will be considered to encompass online databases, electronic library catalogs, optical storage devices, scholarly word processing, electronic journals, computer bulletin boards, and electronic mail networks.

Electronic Writing

A fitting place to start a discussion of electronic publishing and the historian is with historians as authors of scholarly texts, many of whom have made their own contribution to electronic publishing through the adoption of personal computers for writing. Case (1985a, 1986) found that the chief use of computers by scholars has been for word processing rather than for more highly touted applications like statistical, database, and spreadsheet programs. Many academics make their living by writing as well as by teaching. It is no surprise that a general purpose device for symbol manipulation should be used for this most basic of tasks. The computer eliminates much of the drudgery formerly associated with composing, typing, and revising manuscripts, while adding relatively little "overhead" of its own, only the need to learn procedures for saving and printing out files. Although many scholars cling to whatever writing methods have proved successful for them in the past, many more have adopted the computer as a writing tool. Historians, in particular, have been

rather quick to embrace computers for this purpose despite some misgivings among humanists regarding the implications of such an action (Lyman, 1989; Case, 1985a). One small survey of historians (Case, 1991b) found seventeen out of twenty using word processing in their work. In the positive view, word processing is merely one more step along an evolutionary line of human expression that started with cave paintings—it is a kind of super typewriter (Bolter, 1987). Other scholars (e.g., Heim, 1987) express misgivings about the effect of this new tool on our capacities for both writing and thinking.

The very fact that scholars are now using computers to compose monographs and articles gives great impetus to electronic publishing. Whether publishers use the author's own file for typesetting or input the text anew, they are increasingly making use of computers in the processes of composition and printing. Aside from the obvious efficiencies, the use of the computer opens up new possibilities for additional products: citations and abstracts may be stripped out of the full text and passed along to a bibliographic database producer or the complete text may be sold as an electronic product. Several books have been written for the scholar using a computer, including *The Electronic Scholar* by John Lawrence (1984) and *The Scholar's Personal Computing Handbook* by Bryan Pfaffenberger (1986). Lawrence discusses word processing, e-mail, electronic filing, online searching, electronic manuscript submission, and other uses of the computer (and issues such as copyright). Articles discussing word processing are numerous; one written specifically about historians is Patrick Peebles's (1988), "The Impact of Computer Technology on Historical Research." We will next examine the computerization and aggregation of texts into various forms—letters, journals, books, and libraries.

Electronic Letters and Journals

Kronick (1976), Ziman (1976), and Case (1985b) have examined the origins of modern scholarly and scientific journals, and Stieg (1986) has examined the origins of historical periodicals in particular. An eighteenth-century outgrowth of personal letters and meeting proceedings, journals play a key role in the scholarly discourse of many fields. Periodicals devoted to history began much later than scientific journals—the first scholarly historical periodicals were of nineteenth-century German origin and the first of those to survive to the present, the *Historische Zeitschrift,* began in 1859. The *Historische Zeitschrift* created a model of scholarship for the rest of the historical academy to follow.

Given their origin in exchanges between individuals and small groups, it makes sense that some electronic equivalent to journals

is likely to evolve. Many communities of scientists and social scientists already exchange queries, findings, and opinions via electronic mail systems, bulletin boards, and conferences. Special services connect linguists and chemists in swift and surprisingly personal exchanges. Special facilities are not needed—virtually any academic in a research university can send mail through the Bitnet that connects major universities in North America and many others around the world. The scholarly use of electronic mail, at present, is more a question of personal preference rather than the availability of resources. The list HISTORY on Bitnet has sparked only sporadic usage, perhaps due to the individualistic nature of historians, the informal nature of the medium, and the interpersonal distance built into electronic mail—it is hard to create a "faculty lounge" atmosphere through electronic mail, and it is difficult to engage in meaningful debate in such an open forum.

The electronic journal (Seiler & Raben, 1981; Case, 1985b) is a computer-based version of a print journal. In its fullest implementation (e.g., as described by Roistacher, 1978) the electronic journal is a complete system of editors, referees, and subscribers. Contributors may submit text files directly from their own computer to a central store where they are read, judged, and publicized by editors. Readers dial into a central database of these submissions to select the articles they wish to read; they may scan the articles online, printing only the most desirable ones. Such systems could encompass all aspects of the journal producing process—including screening by referees. Indeed, one of the attractive things about Roistacher's vision of an electronic journal is that it has no page constraints; it could "publish" all submissions, allowing subscribers to judge quality for themselves.

Librarians have begun to take advantage of the publishing possibilities of electronic communication. For example, librarian Charles W. Bailey, of the University of Houston, edits the *PACS Review*. The approximately 1,600 subscribers to the PACS-L (Public Access Computers List) mailing/discussion list receive notices regularly announcing the newest issue and how to retrieve individual articles. The journal is not automatically sent to list members, but each article must be individually requested.

One of the drawbacks of electronic journals is that most scholars typically prefer that someone properly accredited should screen material for quality; editors play a key role in the system of scholarly communication by encouraging the quality and discouraging (we hope) the quantity of publications. In turn, the process of refereeing creates a motivation for submitting an article in the first place—the reward system is constructed around the prestige of publishing

in certain places and computer files are not yet so regarded. Indeed, one of the problems that was noted in the first experimental electronic journals was the lack of recognition associated with such publications (Turoff & Hiltz, 1982). The very value of electronic communication has been questioned. Harnad (1990) has likened electronic publishing to scholarly "skywriting." Studies have shown the need to retain other aspects of paper journals—e.g., designating "issues" of a journal is still necessary so that subscribers will know when to access the system to see new material.

Electronic communication may create additional problems for scholars. Access to and use of equipment are obvious problems—these turned out to be sticking points in early implementations (Shackel, 1983). Other problems are less obvious. Paul (1981) and Hannemyr and Flood (1985) point out the difficulty entailed in citing electronic documents or letters. Such documents lack fixity. They may be altered, expanded, or erased completely—unlike the printed word. To use Harvey Wheeler's (1987) words—an electronic document is fluid and fungible. One cannot be absolutely sure of its authenticity. For historians, who put a premium on the veracity of a record, this constitutes a serious flaw. A document must have fixity to be of use. Even conversations are quoted with almost as much fixity as possible, narrowed down to the particular day (though not time).

In summary, publishing journals in electronic form is possible and has been done in other academic fields, but the record so far holds little promise for historical journals. As in other fields, the disappointing outlook is due in part to lack of resources and in part to human factors such as unfriendly equipment and lack of recognition for publication. The need for quick publishing simply does not exist in history as it does in other fields such as the hard sciences and medicine. Another consideration working against electronic journals is the heavy reliance among historians on publication of scholarly monographs. Historians rarely make a career of publishing scholarly articles, and the whole process of research and writing, the time involved, and the kind of ideas presented and developed, resists the publication of short works and rather encourages monographic publication.

However, the use of the computer for personal communications between scholars is in keeping with the individualistic perspective of historical scholarship. Outgrowths of electronic mail, such as bulletin boards, for the exchange of notes about historical topics and materials, hold promise for use by historians. At least one special system, *HumaNet*, already exists for this purpose (Rütimann, 1987). *HumaNet*, online since summer 1986, covers history, philosophy, religion, and English (Slatta, 1986). *HumaNet* represents half of North

Carolina State University's *ScholarNet,* begun in 1985 as a medium for sharing of data and text, teleconferencing, and e-mail. The companion system, *PoliNet,* covers political science, public administration, and criminal justice.

Subscribers to the system may volunteer to function as "online editors" coordinating information on a topic, collating articles, data files, bibliographies, and other appropriate materials. Connected to sixty-five other countries, scholars can easily communicate with their foreign colleagues. Online databases, produced by ABC-Clio, can be accessed through a gateway to DIALOG on both *HumaNet* and *PoliNet. ScholarNet* is growing but more slowly than its Director Richard Slatta had hoped (Schick, 1987, p. 519).

Electronic Books and Libraries

Many historians know that bibliographic databases exist even though they may not use them. The electronic equivalent of printed indexes to publications, they exist in many forms and cover a bewildering variety of subjects, and their numbers are growing incredibly. In 1988, the number of databases available to the public was estimated at nearly 4,000 (Cuadra/Elsevier, 1988). In 1991 that number has climbed to nearly 6,000 (Marcaccio, 1991). Only a fraction of these cover humanities subjects and only a few concern history specifically. The most widely known databases are ABC-Clio's *Historical Abstracts* and *America: History and Life,* both available in machine-readable form as well as in printed versions (Boehm, 1978; Falk, 1981). But humanists in general have not taken to online searching (Rütimann, 1987; Katzen, 1986). Both the expense of database searching and the frequent lack of a precise and unambiguous vocabulary are at fault (Frye, 1973; Wiberley, 1983). Historical databases offer particular problems especially in searching by historical period (Falk, 1981b; Grinell, 1987).

Historians often remark that the very design of printed and online indexes often makes them useless for serious searching because the full text of the article must be scanned to appreciate its true content. Most databases were designed for the sciences, in which the results of investigations may be more concisely stated. Indeed, Maurice B. Line (1982, p. 38) suggests that few articles need to be produced in full text, the abstractor's summary having already said it all (and that "all" not being very much in some cases). Here the literary nature of much historical writing conflicts with the technology—unlike scientific materials, historical works would lose much of their value if produced chiefly in abstract form. Most importantly, abstracts simply do not currently contain the information that scholars find most important—e.g., point of view, theme, etc. (Tibbo, 1989), simply

due to their brevity and the "physical science" model followed by abstracting and indexing services.

However, databases are changing in two ways that are especially significant for historians given the nature of their enterprise—first is the increasing availability of full-text databases; second is the development of CD-ROM for database distribution. Advances in both publishing and storage technology are making full text more and more common. Entire articles and newspapers, such as the *Wall Street Journal, Washington Post,* and *Christian Science Monitor,* are reproduced in machine-readable form for rapid searching. These are available not only from remote computers but also on CD-ROM. CD-ROM has several advantages. It is local rather than remote and the need for modems, phone lines, and operating knowledge of such is eliminated. The CD-ROM is used in conjunction with microcomputers which are familiar to many academics. Finally, and perhaps most significantly, the costs are fixed rather than based on unit of time—once the library subscribes to the database it may be used for any length of time without additional charges (Rütimann, 1987). In fact, the more often a CD is searched the more cost effective it becomes.

If computer-based journals are less likely to appeal to historians, how about electronic books? One can imagine in the future a computer, essentially just a screen, perhaps LED, about the size of an 8 1/2 by 11 inch page and about as thick as a good sized book (Starr, 1983). Transportable, it perhaps need not have a large memory, only the ability to hold a 3 1/2 inch disk which would contain a book (or one or more issues of a journal, for that matter). It could be plugged into a printer for hard copy, and quotations could be excerpted for reading. Such a device is a natural extension of current CD-ROM technology; Sony Corporation's "Data DiscMan Electronic Book"—a hand-held CD-ROM drive with its own liquid crystal display—is an evolutionary step in this direction (Kountz, 1991).

Compact book-like research devices have been the dream of technologists ever since Vannevar Bush's prophetic essay, "As We May Think" (1945). Bush described a desk-like device (the MEMEX) that would store research materials and connect to libraries containing other materials. Not only would it allow reading of such materials, but it would enable the user to browse subject areas in varying depth, connecting one item with another through electronic glosses. Portions of this concept have been implemented in two forms: (1) the scholarly workstation, and (2) hypertext files.

Workstations for Scholars. The Scholar's Workstation, as it is called at Brown University (Moran et al., 1987), is an attempt to create something like Bush's "MEMEX" using current technology. The

centerpiece is a very fast and powerful computer, devoted to a single individual scholar, yet connected to a local network of other computers, peripheral devices (such as laser printers), and databases (such as the library catalog and CD-ROM disks). Such workstations are envisioned as synergistic tools for knowledge creation, allowing the user to create documents and pictures, search online databases, and communicate with other scholars. With such a device, one could, for example, consult a variety of reference works in the course of a project as Crane (1988) describes:

> When studying an idea, we need to move rapidly back and forth between a number of sources, such as maps, dictionaries, texts, or encyclopedic information. A single compact disk devoted to a single subject could certainly store a compact online library. The five hundred or so books that could fit onto a CD would not, of course, replace a major research collection, but they could easily include the most basic resources (texts, dictionaries, grammars, bibliography, commentary, etc.). (pp. 7-8)

As one might expect, the costs for such equipment are quite high and are consequently out of reach of most humanities departments within the near future. Brown University is considering the acquisition of up to 500 workstations to be attached to a campus-wide network. The broadband network would connect all major computers at Brown and would be capable of transmitting conversations and pictures as well as text and other data. The result will be an integration of computations, word processing, information retrieval, data analysis, computer graphics, network communications, and library access (Moran et al., 1987).

Hypertext. Hypertext is a term coined by Ted Nelson (1967) to describe a system that would index and link very large numbers of documents building on the "MEMEX" notion of Vannevar Bush. Hypertext is a way of organizing material in which units of text are linked by users in a flexible and relatively effortless manner. In its ideal form, hypertext would allow a user to form (and follow) chains of ideas as they appear in massive files of electronic text—a virtual library of the world's writings. Unfortunately, the term has become so popular as to be diluted in meaning, as various software publishers have used it to describe new products—all of them far removed from the visions of Bush or Nelson—for writing and searching text files (Borgman & Henstell, 1989).

The presumed advantage of hypertext would be the connection and juxtaposition of relevant items of text to provide new insights—something not too distant from what many historians do currently. The book, it is said, is too linear, too physically constraining, to allow this. But is hypertext really an advantage over the book or merely over earlier versions of computer technology? We are reminded

of the words of Northrop Frye (1973): "the book *qua* book is not linear: we follow a line while we are reading it, but the book itself is a stationary visual focus of a community. It is the electronic media that increase the amount of linear experience, of things seen and heard that are as quickly forgotten" (p. 15).

While the trend in computing machinery has been toward easier manipulation and navigation, as with notebook computers and the introduction of new pen interfaces (Reinhardt, 1991), until a computer is more like a book kinesthetically, electronic publishing of either journals or books is not likely to be very popular among historians. There is nothing quite so "user-friendly" as a book.

Current and Future Applications in History

One could imagine other applications of computer databases in history. A current approach is the development of machine-readable, full-text files of historical material, along the lines of a litigation support database. For instance, published source materials, such as the collected letters of dozens of American historical figures (e.g., Thomas Jefferson), would be potential candidates for publication on CD-ROM. In fact, the University of Virginia has announced their intention of putting the collected diaries and correspondence of George Washington on CD-ROM for distribution to libraries in 1992. Oxford University Press has established an electronic publishing division and is now offering magnetic disk versions of the works of David Hume and John Locke as well as a microcomputer version of their concordance software (Micro-OCP) and a CD-ROM version of the *Oxford English Dictionary*. Specialized electronic publishers have sought opportunities in the discipline of history: one called The Bureau publishes a disk of *Constitution Papers*, featuring the full text of documents relating to the founding of the United States, including the Constitution, the Federalist Papers, the Declaration of Independence, the Monroe Doctrine, and many other documents. While one could argue that such files have limited utility for most scholars, their existence suggests the type of materials that could be made available in this popular electronic format.

Calendars—standard primary historical resources—would be a great boon to the historian as well, for example, the calendar of letters and papers of Henry VIII. A good number of other large primary sources, such as the *Calendar of State Papers, Venetian* (38 volumes), the *Calendar of State Papers, Simancas* (4 volumes), the *Journals of the House of Lords* (208 volumes), the *Pipe Rolls* series (85 volumes), the *Domesday Book* (35 volumes), the *Harleian Miscellany* (3 volumes), and Strype's *Ecclesiastical Memorials* (3 volumes), standard tools for historical research, could be made much more accessible if put into electronic form.

Texts that were typeset using a computer would be much easier to place in machine-readable format; those that were not could be read into a file using optical character recognition (OCR) devices—although OCR remains rather finicky about what it will read reliably. The creation of full-text databases is expensive and labor intensive, beyond the reach of either individual scholars or history departments. Also, the economy of scale in mass market CD-ROM disks would not be reached. Financial support would be required from foundations or consortia of historians or universities to make such products a reality.

Although expensive, such projects could allow more sophisticated manipulation of texts along the lines of those scholars exploring libraries for lost works of Shakespeare and finding them through use of word frequencies. Here the descriptive aspect of history and the evaluative would conflict. The scholar might enjoy manipulating texts, but his or her main goal is a reasoned interpretative description. Devoting too much time to the data defeats the purpose of its existence. The work that a computer can perform is merely preparatory. Putting the Florentine *catasto* of 1427 into machine-readable form is a worthy accomplishment in that scholars will be able to analyze more easily demographic data (Herlihy et al., 1978, 1985). "Publication" of unwieldy chunks of statistical material like the *catasto* in electronic form is quite a time-saving marvel for the historian and will improve scholarship, and similar data sets should be published.

Several history-oriented databases have reached production, typically with foundation or university support. One is the *Thesaurus Linguae Graecae* (Raben, 1986; Brunner, 1991), a collection of pre-A.D. 600 Greek texts. Such projects are not limited to text: *Project Perseus* (a joint project of Harvard and UCLA) has compiled a visual database of 10,000 images in addition to textual databases on the classics (Crane, 1988, p. 41).

The publication of smaller texts is less feasible. Electronic forms face a problem in the singular solitary aspect of historical scholarship. Historians generally work alone on projects, each carving his own niche in some time period and some region. The *catasto* was a promising thing to make machine readable because it was so large that many historians could study different aspects of Florentine society using the same raw data. Smaller data files may offer fewer "economies of scale."

Discussion: History and Electronic Text

In this age of computerization, many aspects of publishing, from typesetting to transmission of text, have changed. These technical and economic changes are bound to affect what is published and

how it is published (Horowitz, 1986), though some types of materials and some disciplines are likely to resist more than others. One of the fields in academia which has resisted technological innovation is history (Wallach, 1988), not only because it is so deeply rooted in the past but also because particular forms of historical scholarship have not had the resources to use expensive equipment and software.

Hanham (1971) and Case (1991a) point out that photocopying has been much more revolutionary than computers. Photocopying allows the transcription and collation of texts and personal and transportable use for scholarship, away from the holding institution's library, and in the historian's office at home or at the university. Electronically published material may be a step backward in some essential ways. The material is mediated by an expensive machine, lacking ready transportability and permanence. It can be readily manipulated but that manipulation leaves no trace or history—the document is seamless; it is both inflexible and too flexible. The cost of electronically mediated publications hearkens back to the days of papyrus rolls and vellum manuscripts; it drastically reduces access. And, until recently, faculty did not have easy access to computers to allow manipulation of electronic materials.

The diffusion of computer use into the historical profession will be determined by the appropriateness of such technology to the kind of scholarship pursued. Those historians most interested in quantification (a task which the computer can do very well) will be the most enthusiastic (Rowney, 1982). For example, Leland Carlson (1981) attempted and abandoned the computer in his attempt to establish the authorship of the works of Martin Marprelate. He felt he could do a better job in textual and linguistic analysis, being unable to pose the problem in any coherent fashion to a computer.

That the mechanics of producing a journal are greatly eased by computerization is indisputable. However, the potential transfer of responsibility for the physical production of scholarly works is one some scholars deplore, seeing themselves responsible for the content and not for its format. Case (1985b, pp. 312-13) describes the evolution of electronic journals through a series of intermediate steps of electronic production, computerized composition, and electronic editing and reviewing. It may be a path that only a few historians travel. Historians will probably never become enamored of the "paperless society," a development which could deprive future generations of historians of many records; this is especially true considering the rapid obsolescence of computer systems and software, a tendency that could make yesterday's electronic text harder, rather than easier, to retrieve.

Conclusion

As more material becomes available in machine-readable form, the historian undoubtedly will deal with it in some fashion rather than ignore a valuable resource. Electronic publishing—defined here as encompassing online databases, electronic library catalogs, optical technologies, word processing, electronic journals, bulletin boards, and their related electronic mail networks—offers a new world of information for the scholar. The chief use of computers by scholars has been for word processing rather than for applications like statistical and spreadsheet programs, and since what historians do mostly is read and write rather than "compute," this predominance of word processing is to be expected. To move the historian from word processing to accessing the larger world of machine-readable text will be difficult at present until the development of computers that are able to switch easily and transparently between applications, along the lines of Bush's MEMEX. Ever smaller and lighter laptop computers are a step in the right direction, allowing "electronic" note taking and easy transferral of those notes to a personal computer. New pen-based interfaces for computers may help, too. However, at present some of the information systems and much of the hardware and software is simply not easy enough to use to make learning to use it worthwhile for the historian—and the law formulated by Calvin Mooers's holds: an information system will not be used if it is more painful to get the information than to do without it.

Writings on the work of historians seem to indicate that they would take advantage of a system which allowed easy access to secondary sources online, such as online library catalogs and online indexes, combined with word processing (see, for example, Reif, 1991). The viability of electronically published journals is less certain. While there has been criticism of the narrowness (and consequent irrelevance to many readers) of articles published in journals such as the *Journal of American History,* the opportunity electronic publishing holds for publishing more articles may not appeal to the profession. The speed of electronic publishing appeals most to the hard sciences and medicine where new experimental results need quick publication. The publication structure of the scholarly historical journal, built up since the 1850s, partly as an attempt to structure the profession as a whole, is slower and more deliberate. Whether this gatekeeping/refereeing structure can (or should) be replicated online is debatable. Publication in electronic journals must be recognized, and this may not happen before a more widespread adoption of both computers and modems by historians (so that they might have access to the electronic publications). Also, since much of the scholarship of history is published in monographic format, a portable electronic book must be developed before machine-readable text will be truly convenient.

The creation of full-text databases of use to historians will be expensive and labor intensive, so financial support would be required from foundations or consortia of historians or universities to make many such products a reality. Historians can turn to other initiatives in the humanities for examples of successful projects. In philosophy, a consortium of university departments and faculty from across the United States—the Electronic Peirce Consortium—is pulling together, in electronic format, the archives of the philosopher Charles Sanders Peirce (Neuman, 1991). Involved in this project is full-text digitization of the text of Peirce's writings. In parallel is support of digitized images of writings which illustrate his writing in various versions, rewriting, hand-illustration, calculations and formulae, and even doodling. Similar projects in history following this model would facilitate more sophisticated manipulation of texts. The possibilities are tremendous, as Sir Thomas Elyot (1531) would have realized: "So large is the compass of that which is named history, that it comprehendeth all thing[s] that is necessary to be put in memory" (p. xxv).

One cannot, in the end, overlook an aspect of electronic publishing which jars uncomfortably with the historical profession; the historian deals with artifacts of the past in some physical form, written or graphic, poetry, prose, or statistics; it is not just the information a document might contain but the evidential value of the physical document the historian uses. Electronic publishing can be impermanent, as anyone who has lost a file knows; in fact, any scholar on the Pacific Rim would be wise to contemplate the fate of the works on his or her hard disk in the face of the next earthquake. Word processing simply allows the quicker and neater production of physical copy. The idea of electronically producing text and having its only form being electronic and never tangible will not appeal to many, even as publication in microfiche is not considered much of an accomplishment. An online catalog has magical "black box" qualities to it, but it only contains a document surrogate, a skeletal representation, useful only in retrieving the actual item. An intangible historical treatise is a virtual contradiction in terms.

History is not a science nor will all agree on whether it is either a social science or humanity. It is both an art and a craft (Becker, 1978). History which employs social science methods may be better suited to take advantage of and be more amenable to electronic publishing, which is ill-suited to conveying the art of written text. For the craft aspects of historical research, however, electronic publishing promises useful tools.

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