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# Aftermath of a Prediction: F. W. Lancaster and the Paperless Society

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## ABSTRACT

Professor Lancaster's audacious prediction of a paperless society by the end of the twentieth century is examined from multiple perspectives. Rationales for the prognostication, textual and contextual; reception by the profession; and impact on the literature of library and information science are reviewed. Bibliometric data is introduced in support of the extensive citation links to Lancaster's core writings. The accuracy of Lancaster's prediction and the leavening insights of the collateral literature are considered.

## DEFINING THE EXPERIENCE

Sometimes we call upon fiction to explain and to make us wiser. The transition from print dominance to paperless ascendancy was one of many important historical shifts. The change from scroll to codex and the introduction of moveable type were also hugely significant innovations. Linking them all together, Thomas Wharton tells us that:

Within every book there lies concealed a book of nothing. Don't you sense it when you read a page brimming with words? The vast gulf of emptiness beneath the frail net of letters. The ghostliness of the letters themselves. Giving a semblance of life to things and people who are really nothing. Nothing at all. No, it was the reading that mattered, I eventually understood, not whether the pages were blank or printed. The Mohammedans say that an hour of reading is one stolen from paradise. (Wharton, 2002, pp. 75–76)

### A COMPELLING FUTURE

Professor F. W. Lancaster's protean legacy, still unfolding, encompasses four decades of excellent teaching, superb scholarship, and professional leadership. This essay will focus on his justly famous predictions about the paperless society and the future direction of libraries and the librarians who manage them. Although this aspect of his scholarship represents only one facet of his many contributions, it is perhaps the most often cited, invoked, and debated. It has been exactly three decades since Professor Lancaster launched his own library Sputnik, namely his transformative volume entitled *Toward Paperless Information Systems* (Lancaster, 1978a).

Generously acknowledging such information pioneers as Vannevar Bush, J. C. R. Licklider, and John G. Kemeny, Lancaster then lays the foundation for his own vision of an information-driven, paperless society. And it was a blueprint nurtured by his prior employment with the Saul Herner Company, the National Library of Medicine, Westat Research, and the Central Intelligence Agency. Propelling Lancaster's futuristic information model was a pervasive concern with the proliferation of the scholarly literature, the cost of producing journals, and the increasing expenses for libraries to acquire and process journals. Lancaster's scenario for an electronic information system for the year 2000 revolved around what he referred to as the "library in a desk" (Lancaster, 1978a, p. 3).

Scholars and students would have access to major digital files composed of bibliographic information and full-text documents. Scholarly journals, for example, would be composed, edited, distributed, and accessed through his proposed online system. Further, this unified online system would (1) facilitate rapid and effective person-to-person and group-to-group communication; (2) maintain indexes to ongoing research to make these highly accessible; (3) make the archival literature of sciences as accessible as possible; (4) provide facilities to aid the scientist in building and exploiting his own information files; and (5) provide rapid and convenient access to the facilities of one or more information analysis centers.

Lancaster was especially concerned with the proactive distribution of information through a selective dissemination of information (SDI) mechanism. And what of the libraries and librarians that will preside over the coming digital juggernaut? In *Toward Paperless Information Systems*, Lancaster assumes a possible withering of libraries, but redefined roles for librarians in "libraries without walls" suggested so presciently by Robert S. Taylor in 1975. Lancaster closes *Toward Paperless Information Systems* with a vigorous reaffirmation of the coming paperless society and an almost solemn warning that if we do not plan for its arrival we may be overwhelmed by the ensuing chaos:

The paperless society is rapidly approaching, whether we like it or not. Everyone reading this book will be affected by it in one way or

another. We cannot bury our heads in the sand. We may choose to ignore the electronic world, but this will not make it go away. Now is the time for responsible organizations to study the implications of the rapid technological changes that are occurring for the operations of publishers, primary and secondary, for the operations of libraries and information centers, and for the individual scientist as producer and user of information. If we do not plan now for the years ahead, we may find that transition to be one of disruption and chaos rather than one of ordered evolutionary progress. (Lancaster, 1978a, p. 166)

In the same year, Lancaster boldly addressed libraries and librarians in his classic paper, "Whither Libraries? or, Wither Libraries" (Lancaster, 1978b). He recognizes those scholars who examined such issues as the escalating costs of periodical subscriptions, space problems, and the labor-intensive nature of library activities. He then dismisses the solutions offered to cope with these problems, namely increased resource sharing, more analytical selection and retirement of materials, and an increased reliance on library automation. The fault lies in their assumption that the future will still accommodate a very large print collection. Many of these commentators, and the profession at large, are "myopic in the extreme." Lancaster further notes that "this view ignores the significance of many social, technological, and economic trends, quite evident in the world around us, that point unambiguously to the fact that many types of publication, perhaps the great majority, are highly unlikely to exist indefinitely in print on paper form" (Lancaster, 1978b, p. 346). Technology now exists to provide a new scholarly communication system, with textual material in machine-readable form and scholars and students retrieving data through individual computer terminals. Secondary textual information and bibliographic files will emerge first and be followed by a longer emergence of electronic scholarly journals. It will become a dynamic, interactive system and be far more manipulable than the current linear manifestation of print. Lancaster does not duck the core question of his article—can libraries survive in a largely electronic world? His jeremiad once again comes at the very end:

The profession seems to have its head in the sand. The paperless society is rapidly approaching. Ignoring this fact will not cause it to go away. The profession, if it is to survive, should now be devoting energy to the serious study of how it can adapt to life in this society. Unless it now faces up to the question "whither libraries?" it will indeed face the prospect of "wither libraries" (Lancaster, 1978b, p. 357).

### MANAGING THE STORY

Lancaster's paperless prophecy hit the library runway with a flourish, garnering widespread interest, commentary, and citation in the works of numerous other authors. Many readers recall these two classic pieces of library literature, but many perhaps are not aware of the continuing comments by Lancaster on his original prediction in subsequent publications.

For nearly three decades he managed this important story thread in the professional literature. Within a year, Lancaster restated and amplified his views on the future of a paperless society (Lancaster, Drasgow, & Marx, 1980a). The march toward a paperless environment will proceed in three phases: use of the computer to print documents, coexistence of print and electronic sources, and finally the predominance of electronic materials. A strong electronic presence will be required to overcome the basic problems of the exponential growth of information, escalating costs, and the inefficiency of the various processes of production and distribution. The differentiation of the library from the physical setting of the library is once again considered an inevitable progression, with librarians becoming more like roving consultants than space-bound keepers of the book.

The inevitability of his paperless vision is restated in the *Catholic Library World*, and reemphasizes the notion of disembodied library resources and externally orientated librarians (Lancaster, 1980b). Lancaster and Smith review the retrieval capabilities of print indexes and online services. The introduction of online services requires attention to the following factors: costs, staffing, facilities, service promotion, and document delivery. The now familiar three-stage phasing of the transition from print to digital format is restated. Librarians will, in time, become information specialists in a deinstitutionalized setting (Lancaster & Smith, 1980c).

Consolidating ownership of his prediction, Lancaster issued an exceptionally well executed monograph, *Libraries and Librarians in an Age of Electronics* (Lancaster, 1982a). This volume is a standout for the breadth and depth of its coverage. Lancaster opens the narrative with a skillful delineation of the social commentators such as Daniel Bell who contributed so much to the "post-industrial" dialog. Other chapters encompass technological capabilities, computers and publishing, paperless communication systems, libraries and technology, future of the library, and disembodiment of the library. Of special interest is the extended discussion about "some dangers," which may pose problems for the progression of paperless information systems. Future digital information resources have the potential to reinforce and spread democratic values, but there are ever-present dangers of an elitist hijacking of such resources for the use of a limited few. He concludes that political and social factors, generally a retardant on the rate of change, and technological and commercial factors, generally an accelerant to change, will be in a dynamic tension in the coming decades.

A summary of the book appeared the same year under the title, "The Evolving Paperless Society and Its Implications for Libraries" (Lancaster, 1982b). Library education received special attention in the following year via an article in the *Wilson Library Bulletin* (Lancaster, 1983). Once again the library is seen in a steep decline, and new roles for librarians will ma-

terialize only if they can successfully adapt. The inclusion of the principles and techniques of information science into library school curricula will be vital to the successful reorientation of the information profession.

Seven years subsequent to his first paperless prediction, Lancaster decided to take stock of progress toward this goal and address issues of concern (Lancaster, 1985). Evolution toward the paperless society is proceeding even more rapidly than he had forecast nearly a decade ago. Personal computers are ubiquitous and electronic mail is rapidly becoming a dominant communication technology. Several hundred databases can now be accessed from a single terminal, and more full text databases, journals, newspapers, and magazines are now appearing throughout the publishing arena. Once again, the library is ordained for almost certain disappearance, but librarians will thrive with newly reconfigured missions and service orientations. The book is not to be considered immortal as it has been with us a mere five hundred years. He concludes with a heightened concern about the impending future:

The fact that I have written about an electronic future does not necessarily mean that I endorse such a future or that I enthusiastically look forward to it. A new technology may improve an existing situation but bring with it its own set of problems. It can be used to benefit society or to impair it. The impact is determined by the qualities of the humans who exploit it, rather than by properties inherent in the technology itself. (Lancaster, 1985, p. 555)

Mounting concern over the qualitative outcome of the future prompted Lancaster and Bradley to compose a fictional short story in 1989. Extending the paperless society prediction to the year 2090, they construct an Orwellian universe in which "the Brain" serves as the noninteractive provider of information to all of his clients (Lancaster & Bradley, 1989). Lancaster and Bradley are clearly alarmed about the robotic future and they are alerting the profession through another literary vehicle. Lancaster's liberating humanism is most apparent in this contribution.

Librarians' response to the spread of technology troubled Lancaster, provoking a strong, even harsh remonstrance. Technology gains have not yet produced the desired results. Automated circulation systems, for example, should not exist solely to reduce costs or to accelerate transactions. The true benefit lies in the data generated to improve management information. Such information can enhance collection development and resource allocation decisions. Data elements in the traditional card catalog, now transformed into online files, do not significantly enhance subject access. Printed bibliographies are still the most productive sources. Librarians and library educators have uncritically joined the digital express. Yet, the image of librarians and concern for library users has not appreciably improved. The gauntlet is then laid down:

What is happening to the profession? Meetings of librarians now sound like meetings of programmers. Over the last few years I have met librarians in a wide variety of settings, in developing countries as well as developed. Almost without exception, they want to talk about their new microcomputer or the latest program they have acquired. I can't remember the last time I had lunch with a group of librarians and heard one of them actually mention library users. (Lancaster, 1991, p. 12)

Still proselytizing, the paperless conductor launched another volume to reaffirm the projection, to convert the wayward, and to revitalize the vision. *Libraries and the Future: Essays on the Library in the Twenty-First Century* contains eleven insightful essays on libraries and the future, and includes such contributors as David Penniman, Pat Molholt, Kenneth Dowlin, Maurice Line, Frederick Kilgour, Lauren Seiler, and Thomas Surprenant. All of the authors, in varying degrees, embrace the brave new paperless world. Penniman cogently suggests that we need a two-part model that consists of assessing where we have been and a forward-acting bridge that sees a future design by us not driven exclusively by technology (Lancaster, 1993). In the same year, Lancaster replayed his message in the *Herald of Library Science*, a library science journal published in India. The article ends with a declarative chant: "The library is dead. Long live the librarian!" (Lancaster, 1993, p. 171). In just six years Lancaster would turn on his child with a scathing critique.

Lancaster's final introspective assessment of his initial prediction came in 1999, more than two decades after his initial forecast (Lancaster, 1999). He notes that a paperless, network-based communication system has materialized. He believed initially that it would be a desirable evolution, but as the years passed he has become "less enthusiastic" and "downright hostile toward" the manifestations of the electronic revolution (Lancaster, 1999, p. 48). He laments the trend toward dehumanization that can be found in many contemporary technologies. He notes that computers now usually answer his calls, and worse yet, they are starting to call him. He confronts the naivete of many librarians regarding the supposed benefits of technology. Librarians too often confuse technology as an enabling mechanism rather than an end unto itself. Our catalogs remain imperfect and not richly encoded enough to attain high rates of relevant retrieval. Librarians, without any research basis, often proclaim that more access means better access. Libraries need to reemphasize the connection between the library and the user, and to reaffirm public service throughout the enterprise. He concludes with his usual straightforward and elegant prose:

Technology alone will not improve the perceived value of our services to users. We need to reduce our preoccupation with technology and increase our concern for library users as individuals with individual needs. We need to recognize that the ethic of public service should be at the center of our professional education. We need more warm librarians. (Lancaster, 1999, p. 50)

## RECEPTION

Reviews of *Toward Paperless Information Systems* were invariably positive, and sprinkled with cautions and insights. Michael K. Buckland, writing in the *Journal of Academic Librarianship*, notes that Lancaster's phrase "paperless" should read "computer-based." He goes on to note that Lancaster's volume is a "tract for the times, a combination of evidence, prediction, and enthusiasm." More commentary on the social and psychological aspects of the paperless society, as well as a more comprehensive depiction of the future of libraries and the modified role of librarians, would have been helpful (Buckland, 1980, p. 349). Estelle Brodman, assessing the book for the *Bulletin of the Medical Library Association*, concurring with the basic premise of Lancaster's volume, believes that there will still be many technical, intellectual, social, and psychological problems that must be addressed before the wide-scale adoption of a paperless system. Further, she relates that history tells us that such systems do not evolve in a global pattern, but rather are brought about in small increments that serve as progressively larger building blocks (Brodman, 1979, pp. 437-439).

*College & Research Libraries* featured a review by Audrey Grosch in which she declared: "Lest we all think we can hide our heads in the sand and play ostrich, information specialists and librarians should realize that we see ample evidence of what Lancaster addresses in this volume. . . ." (Grosch, 1979, p. 88). Gerard Salton writes in the *Journal of Documentation* that

Throughout the book, the author's obvious enthusiasm for the paperless society is much in evidence. He thus accepts unquestioningly all sorts of alleged drawbacks of existing information generation and documentation systems, and he refuses to consider compromise solutions which would maintain at least some hard-copy products as well as library systems similar to what we know today (Salton, 1979, p. 250)

Concluding on a very positive note, Salton urges colleagues to buy this book for Lancaster "offers much food for thought, as well as a not unlikely blueprint for what is in store for the future" (Salton, 1979, p. 252).

"I not only agree with the author's thesis, but I feel it will come about in a more dramatic way than he implies," says Charles Meadow in a highly complimentary *Library Quarterly* review. He indicates that Lancaster might have noted that the journal is a technological artifact and has not always existed. Journals were created for the convenience of readers and can be modified when there are other benefits that emerge. He goes on to take issue with Lancaster's playful assertion that electronic systems would be for important information needs and not, for example, recreational viewing such as *Playboy* magazine. On the contrary, Meadow looks forward to high-resolution images over the years that will duly enhance the electronic readability of *Playboy* and other recreational media (Meadow, 1979, pp. 327-328).

Lancaster was soon widely cited in books and periodicals, and some of them commented rather extensively on his prediction of a paperless information system. Richard De Gennaro, a prominent advocate of technological advances in libraries during the 1980s, concludes that:

Lancaster is one of the most thoughtful and articulate spokesmen for this point of view. To the extent that he is concerned with electronic systems in support of research and communication in science and technology and other scholarly areas in the 20-year time frame, his views have considerable validity as a conceptual framework. However, when he predicts the coming of a paperless society by the year 2000 and the passing of books, journals, and libraries in that time-frame, his writings must be treated as mere speculation or a kind of science fiction. In any event, if the paperless society comes on Lancaster's schedule, it will be but a small part of a massive transformation of our society and our way of life. (De Gennaro, 1982, p. 1047)

Several years later De Gennaro asserts that while libraries must embrace technology, the model must be one of adapting the new technologies while maintaining a vital commitment to print resources. There must be no dilution to the centuries-old accumulation of collections and services to access them (De Gennaro, 1984).

In 1988, Svend Larsen offered the most substantial, philosophically-based critique of the Lancaster prophecy (Larsen, 1988). Larsen conflates Lancaster's *Toward Paperless Information Systems* (1978) and *Libraries and Librarians in an Age of Electronics* (1982) as the starting point for his essay. He does acknowledge that Lancaster has slightly moderated his views, but maintains that the two books "contain a very systemic and articulate formulation of the idea of an electronic library" (Larsen, 1988, pp. 159-160). Lancaster places great stock in linking all sources together in a network for the most rapid access of information about any subject. There are problems of a practical nature to be solved, and that rapid access is a precondition to important progress in science. Larsen challenges this premise. He does not believe that all problems can be solved by searching electronic databases. Larsen attaches himself to Immanuel Kant's position: "enlightenment is man's emergence from his self-incurred immaturity" (Larsen, 1988, p. 161). Clearly, Larsen believes in the importance of making independent judgments, with the guidance of others as needed.

Computers simply will not answer all questions, and experience and wisdom are necessary ingredients to some advanced decisions. Knowledge is indispensable, but it is not obtained primarily through literature and libraries, but rather by living and through knowledgeable people. The economic contributions of technology are not enough to sell the vision. The "distorted view of human identity is, however, at the root of Lancaster's discussion of the future of the research library" (Larsen, 1988, p. 162). Science is appropriately viewed as the pursuit of truth, and rapid response

times to retrieve information for personal reward is at variance with that essential goal of science. Lancaster is incorrect by conveying the notion that information demands for development and innovations transform into a universal need for all research activities. According to Lancaster, rapid access to information is vital to avoid duplicative research, but basic science thrives on multiple projects working on the same problems. Further, Lancaster does not comprehend the cumulative nature of information and the value of older texts for the humanities and other disciplines.

Larsen summarizes with a strong critique:

Lancaster is wrong in considering only the goal-directed, immediate utility or economic gain. His standards are solely efficiency and economy. Using philosophical terminology you could say that Lancaster is only concerned about "instrumental rationality." Instrumental rationality is certainly an indispensable element of modern identity. But there are other important elements that are neglected by Lancaster as I have tried to show in discussing his views of the need for information, the nature of technology and the character of knowledge and science. And only on the basis of a *balanced* view of human identity and values is it possible to make a reasonable assessment of the impact of modern technology, on libraries and on society at large. (Larsen, 1988, p. 175)

And let there be no doubt about Larsen's commitment to the library's future:

the library is an important factor in the collection and communication of experience and ideas, and it is part of the system of cultural and educational institutions that supports the individual in forming and developing imagination and judgment. (Larsen, 1988, p. 161)

Employing an eye-catching headline, "The Electronic Straitjacket," John Swan advises readers to "resist an electronic vision in which the mind is shaped rather than liberated by the computer" (Swan, 1993, p. 41). We have become smitten, Swan asserts, with the glamour of computers, and in the process have sublimated or forgotten our core values. Libraries are about much more than instant access. For decades, Lancaster's prediction has pervaded our literature and our consciousness. There seems to be only electronic solutions and warnings that, if we do not rapidly accommodate the electronic future, libraries and librarians will perish. We must resist private sector and commercial interests from dominating librarianship. There will be an inevitable pay-as-you-go elitist menu if this nightmare comes to pass. Plaintively, Swan suggests that

we must resist the unexamined, widely repeated claims that all answers are electronic. What really happens is that all the answers that are not electronic are ignored. We must resist the drive to turn libraries entirely into switching stations on the electronic network. This takes personal courage. (Swan, 1993, p. 44)

More than a decade after Lancaster's prediction, Michael Harris and Stan Hannah tackled Lancaster's paperless dream with a firestorm of criticism (Harris & Hannah, 1993). Citing Larsen's measured, philosophical observations about the Lancaster model, Harris and Hannah cover much of the same ground using rather excitable rhetoric. Harris and Hannah use the powerful vision of Daniel Bell in *The Coming of Post-Industrial Society* as the launching pad for their Lancaster critique. Bell postulated a new social framework combining telecommunications and computers that will highlight the value of intellectual property as a commodity in the new order. The new intellectual technology will serve as the enabler of systems analysis and decision theory. Bell's view, clearly a technocratic vision of social management, came with a sense of inevitability. Many librarians adopted this vision of an information society that may well enhance the influence and status of libraries and librarians. Harris and Hannah note that it was "probably inevitable that the library profession should find its own version of Daniel Bell within its own ranks, and that discovery was soon in coming with the emergence of F. W. Lancaster as the most out-spoken and influential advocate of the librarian as 'information professional'" (Harris & Hannah, 1993, p. 36).

Parallels between Bell and Lancaster, according to Harris and Hanna, include injecting contradictions, vacillating between scenarios and reality, and introducing qualifications while always endorsing the notion of an electronic future. Both writers are technology determinists. After recapitulating Lancaster's reasons for the coming paperless society, Harris and Hanna codify their version of his vision:

The computer combined with telecommunications technology and expert systems will *displace* the print-on-paper system and thus render both traditional libraries and librarians obsolete. Forward-looking and opportunistic "information specialists," however, will thrive in the "paperless society" by moving from the public sector 'custodial' function to a private sector "entrepreneurial" role. (Harris and Hanna, 1993, p. 39)

Harris and Hanna go on to characterize Lancaster's plethora of papers on this subject as a "tendency toward more dogmatic, determinist, reductionist, and technocratic visions" (Harris & Hanna, 1993, p. 39). Lancaster's "totalizing vision," "privileging" of the computer for all information needs, and misunderstanding of the social and economic complexity of print-based scholarship are serious flaws in his vision. Harris and Hanna do commend Lancaster for getting into the fray, and for later modulating his views to incorporate more social and economic dimensions. Reactions to the Lancaster vision often produced competing and sometimes uncompromising visions. Early proponents of the Lancaster vision include Patricia Molholt, Thomas Surprenant, Richard Dougherty, James Thompson, and Allen Veaner. Those raising significant questions include Patricia

Glass Schuman, John Buschman, and Maurice B. Line. Harris and Hanna conclude that Lancaster's myopia was compounded by his near-exclusive reliance on library literature for constructing his information future. Faulting Lancaster for not incorporating significant amounts of post-industrial literature beyond Bell and a few others is completely unfair. The vast majority of citations in Harris and Hanna, copious to be sure, are dated after Lancaster's seminal 1978 book.

Reverberations from Lancaster's prediction take us right up to the present. David Miall identifies a number of concerns on behalf of humanists undertaking online literary studies (Miall, 2001). Access to text has certainly increased with the advent of the Internet, but serious issues remain about textual authenticity and the lack of sophisticated analytical tools to maximize the study of digital texts. Another troubling issue is the increasing distance of libraries and librarians from the process of accessing digital text. This process, termed *disintermediation*, is likely "to lead to inappropriate and spurious connections, unfounded assertions, and misinformation" (Miall, 2001, p. 1412). Miller and Harris review the many challenges that still remain for cost-efficient scholarly journal publication (Miller & Harris, 2004). The proliferating number and size of many journals, together with strained library budgets, has not yet resulted in the pervasive economic efficiencies forecasted by Lancaster. More journals need to have an online presence, reduce costs and pass them on to the consumer, and form partnerships with other like entities to achieve efficiencies.

In 2004, David Kohl, editor of the *Journal of Academic Librarianship*, reflected on Lancaster's early prediction and its outcome two decades later (Kohl, 2004). He concludes that computers have accelerated the use of paper, book sales have risen rather dramatically, and that large academic libraries were buying approximately 7,000 more volumes per year in 2002 than in 1987. Kohl reminds us that television was supposed to replace radio, but that prediction has long fallen by the wayside. He believes that "We live not so much in a post-Gutenberg society, as in a Gutenberg society on digital steroids" (Kohl, 2004, p. 177). Venturing a prediction of his own, Kohl hopes that "with wisdom, librarians can be both technophiles and bibliophiles" (Kohl, 2004, p. 178).

While the Gutenberg galaxy still remains prominent in today's libraries, there is little doubt that the concept of the virtual library is making headway. Academic libraries, in particular, have experienced lowered gate counts, circulation, and other transactional indices. Use indices are down some 20–30 percent. In reviewing this trend Charles Martell implores libraries to come up with more creative accounting for online transactions in order to avert the continuing loss of fiscal support for library facilities and services (Martell, 2005). Finally, we should expect that the Molesworth Institute would be following this important theme, and once again

it has not let us down (Stevens, 2006). The new fully electronic library, as cleverly crafted by Stevens, will have no books or paper and be staffed with a bevy of highly paid library consultants. There will be no administrative staff, no formal organizational structure, and possibly no meetings, memos, or reports. Stevens's boundaryless electronic library will surpass even the dream of Alexandria.

### IMPACT

When this essay appears, Lancaster's prediction of a paperless society will celebrate its three-decade anniversary. Moving from observations, opinions, and further speculation, it is appropriate to examine Lancaster's prediction from a bibliometric perspective. "Whither Libraries?" (1978) was reprinted as a classic paper in *College & Research Libraries* in 1989. *Toward Paperless Information Systems* was awarded Best Book by the American Society for Information Science in 1979. The Web of Science database, as extracted by Eugene Garfield in a special file on *College & Research Libraries* publishing activity for the period 1956–2004, ranks "Whither Libraries?" as the 15th (with 30 citations) most cited article from *College & Research Libraries* represented in the total Web of Science database. For context, there were 3,133 articles in *College & Research Libraries* during this period (Garfield, 2004).

Executing Google searches extends our understanding of the extent of Lancaster's influence on the works of others. Google searches under Google Book and Google Scholar in August 2007 enhanced the findings of the citation indexes considerably. *Toward Paperless Information Systems* produces 548 hits on Google, 148 hits on Google Book, and 84 hits on Google Scholar. "Whither Libraries?" appears in Google 355 times, in Google Book 13 times, and in Google Scholar 26 times. Both book and article have staying power, as evidenced by the fact that all Google searches reveal multi-decade appearances. Foreign language citations are present for both of Lancaster's core works.

Lancaster's first Festschrift was the 17th International Essen Symposium (1995). He was especially commended for studying "the implications of advanced information systems for the future of libraries in society." The testimonial continues:

The more general significance of Lancaster's work results from his ability to combine a rigorous and thorough approach with a clarity of expression that renders advanced concepts of information retrieval accessible to the student and practicing librarian without oversimplification. (Helal & Weiss, 1995, p. xiii)

A special accolade related to Lancaster's prophetic journey was the appearance of Gregg Sapp's splendid volume, *A Brief History of the Future of Libraries: An Annotated Bibliography* (Sapp, 2002). Each of the 662 items,

articles and books, either cites *Toward Paperless Information Systems*, or another that cites it. By using this approach, Sapp ensures that the “information in the bibliography is part of a true, organic literature, which has flourished from a common source” (Sapp, 2002, p. vii). Sapp has given us an expansive and richly interlaced Lancaster family tree. His introduction provides a comprehensive portrait of early library futurists and each of the four main sections neatly summarizes the literature under review. The annotations are informative and a fine thematic index rounds out the volume.

## REFLECTIONS

F. W. Lancaster’s extended hovering over his “paperless society” prediction is surely a record in the field of librarianship, and one that may well encompass most other fields. The initial scenario as presented in 1978 with an accompanying flurry of books and articles explicating the notion found a largely attentive and receptive audience. He acknowledged criticism, albeit not always overtly, in several important papers that modified his early views to accommodate more of the human factors perspective. The massive invasion of computers and the Internet probably exceeded Lancaster’s most optimistic thoughts. Almost singularly focused on technological inevitability, Lancaster did not at first recognize the enormous degree of social indifference, the resistance in the workplace, and the tenacious hold of Gutenberg’s book on librarians and the general public. In fairness, there was very little solid literature on how people used paper and computers at the time that Lancaster wrote his contributions.

We now have a number of works that present research-based insights and policy implications about the strengths and weaknesses of traditional print versus screen viewing and reading. One of the best is *The Myth of the Paperless Office* (Sellen & Harper, 2003). According to Sellen & Harper, “paper tends to find its natural place in workplace activities that are point-of-use activities or that are the kinds of activities we normally think of as key to knowledge work, . . . activities that involve making judgments, solving problems, making sense of information, making plans, or forming mental pictures of information.” Conversely, digital tools “tend to find their natural place for many of the activities *supporting* these point-of-use or knowledge work activities . . . [such as] support for the accessing and organizing of information prior to its use or prior to the thinking or collaborative processes that need to take place” (Sellen & Harper, 2003, p. 206). And we know much more about the socio-economic implications of the digital world and the need for an equitable distribution of computerized capabilities (Wilhelm, 2004).

The who’s in charge question, the computer or the user, emerged in Lancaster’s later writings, and is now a much more central concern. Ben Shneiderman’s exquisitely written and imaginatively titled volume, *Leon-*

*ardo's Laptop*, addresses this question throughout. The author's stance is clear at the outset:

The old computing was about what computers could do; the new computing is about what users can do. Successful technologies are those that are in harmony with users' needs. They must support relationships and activities that enrich users' experiences. Information and communication technologies are most appreciated when users experience a sense of security, mastery, and accomplishment. Then these technologies enable users to relax, enjoy, and explore. (Shneiderman, 2003, p. 2)

Invoking C. P. Snow's 1959 *Two Cultures* lecture, Shneiderman cautions that we are at the crossroads of a destructive digital future and an open covenant society dedicated to social betterment (Snow, 1959).

Ultimately, Lancaster saw the coming of the paperless society and the Internet as problem solvers, and that anticipation is still with us. We remain cautiously optimistic about electronic-centered solutions to many problems, scientific and social. Returning to the opening quotation from Thomas Wharton, the future of librarianship and the reading enterprise will not be just about the paper or the screen or what one can see on it, but rather the sometimes mystical interaction between reader and device. Lancaster's final accounting embraces this verity.

Transcending these comments is the fundamental daring of Lancaster's forecast. He engaged a generation of scholars, students, and practitioners in a grand debate about new directions for an entire profession. Few so engage, fewer carry on for more than twenty years, and fewer still call it so essentially right.

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