A Computer is Not a Typewriter, or
Getting Right with Information Technology in the Humanities

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My qualifications to give this talk are dubious at best. Perhaps there is hope for me, however. I only learned to drive a car with a standard transmission when I was in college, though that is an instance of learning to prefer the old (but better) technology. But how many of you in this audience can drive a shift car? I have been using a computer for word processing since the introduction of the IBM PC, I have been a regular user of e-mail since about 1986, and I have been addicted to the World Wide Web since the University of Illinois (followed by Netscape) made the Web accessible to morons. I regularly consult digital archives and library catalogues through my computer, I take research notes in my notebook computer, I have finally mounted a personal web page and I am even learning how to manipulate a large research database mounted for me by one of my graduate assistants. In other words, I am an addict of digital technology, but always scrambling to catch up to the trailing edge of technology. For those of us enthusiasts who have seen the future and decided that it works, there is much to be satisfied about. So why am I worried? So why am I here talking to you this afternoon and (as you will discover) calling for action?

Let me explain by means of a long excursus concerning my experience as President of the American Council of Learned Societies. I accepted the ACLS presidency 13 years pretty much to the day from today, and remained on the job for 11 years. Since ACLS

is, among other things, a consortium of the major professional societies in the humanities and social sciences, an important part of the President's job is to inform himself about the concerns of the societies, and to explore courses of action and programs that address those concerns. Although I was a long-time member of several professional societies, and had been president of two of them, I was quite new at the job of policy analysis and program formulation for the humanities as a whole. But I was (and am) a scholar and teacher of public policy, and the challenge was exciting.

My first and strongest impression of the mise en scene for the fields of the humanities was that there was something terribly important going on that the institutions of the humanities had not organized themselves to reflect upon and respond to. That "something" was the emergence of information technology as a significant factor in the development of research and pedagogy, and the guilty institutions ranged from ACLS and the learned societies to colleges and universities, independent libraries, museums and the like.

There were of course individual scholars who were already thoughtfully making use of new technologies, and there were even whole fields that had seen exciting new possibilities. Of these, surely one of the best examples was computational linguistics, a field entirely made possible by the computer. The social scientists, like all scholars who worked with large data bases, were also well along in the use of mainframe technology and developing new techniques for "number crunching." The geographers were beginning to use GIS technology, and the dictionary makers were learning how to revolutionize their techniques through the power and memory of computers – the magnificent Dictionary of American Regional English being the supreme local example of what could be accomplished. And even the purely humanistic fields were taking advantage of computer technology. Two of the best examples would be the Thesaurus Linguae Gracae, originally a CD-ROM based fully searchable electronic database of all Greek texts written between 600 and 1453 A.D., and the Dante database that contains the works of his principal commentators. Other traditionally labor intensive humanistic efforts such as concordance making were suddenly transformed from a generations-long process to one that could be accomplished in a reasonable number of years. Such electronic resources made substantial bodies of knowledge accessible to any scholar with an interest and the requisite language skills, rather than the preserve of the few who had been able to devote the time to read through them. Furthermore, by altering the means of knowledge, electronic access transformed our perspective, as the new field of corpus linguistics has demonstrated.

There was, then, much good news about the potential of IT for the humanities when I began my tenure at ACLS in 1986. The bad news, as I have already suggested, was that this activity was scattered, ill coordinated and unevenly dispersed across the

fields of the humanities. There were few forums for discussion of IT and the humanities on a national (or preferably international) basis. There was little inter- or, more important, intra-university support for humanities computing and access to digital technologies. The one national organization that had emerged, the Association for Computing in the Humanities, was until recently limited in its vision to text-analysis (and especially text encoding), and did not yet focus on the larger range of problems and possibilities for the humanities.

It seemed to me that ACLS, as the national humanities organization, had a responsibility to address this set of challenges to research and teaching. We had, in fact, taken an important step in this direction in 1984 (in response to an earlier ACLS report on scholarly communication in the humanities), by establishing an Office of Scholarly Communication and Technology in Washington, D.C. Under the able leadership of Herbert Morton, this office published a newsletter that was the first national publication on IT and the humanities and it also undertook a survey of the use of technology by humanists. But the sad fact is that we were not able to determine how best to employ the limited foundation funding available, and I reluctantly closed the office in 1987 as we began to consider alternative approaches.

The core of ALCS is a body called the Conference of Administrative Officers that meets semi-annually to discuss matters of common concern to the societies. Early in my dealings with the CAO I was becoming aware of the potential for electronic document delivery, and I began to wonder what impact the availability of electronic article-level citation and transmission of full-text articles to individual users might have for our societies. It seemed to me that the development of these capabilities, and more generally the electronic publication of journals, might have a devastating impact upon society membership levels. Scholars join societies in their fields primarily for two reasons (though of course grad students join to have access to the job market function) – to receive discounts for registration at society annual meetings, and to receive the society's journal. But the discount is small (and most members do not attend the annual meeting), and if members or potential members could access individual articles and book reviews electronically, why should they pay for membership?

I therefore raised this specter with the Executive Directors at a CAO meeting and was told in no uncertain terms that this was a misplaced concern – traditional journal publication would continue to be the core of society membership. But everyone is a prophet at least once in his life, and it was not more than a few years until the focus of discussion at CAO meetings was on how to take advantage of technology, and on how to avoid its potentially harmful consequences. The societies had already proved quite adept in computerizing their membership operations, and in taking advantage of computers to produce traditional analog journals in a more efficient and effective way.

Today they all make good use of web pages and certain kinds of limited electronic publications, but few have thus far been as visionary about the possibilities of electronic publication as have their sister societies in science and engineering. The problem, in my view, is that the societies have only just begun to conceptualize the role of IT in their organization and behavior.

The problem for the CAO, like the humanities generally, is not simply to take advantage of particular technologies. Both the societies and individual scholars have been remarkably adept in doing just that. The problem is to step back and ask larger questions about the implications of technology for how we think about the humanities; how and what we research in the humanities; how, as a field, we compete for the resources necessary to bring us fully into the electronic environment; and how we organize ourselves to develop and support public policies required for our success. I will devote the remainder of this talk to ACLS efforts to address these problems, and to the tremendous challenges that lie ahead of us.

The first project I initiated at ACLS was the replacement of our flagship reference work, the Dictionary of American Biography. This is a book, that ACLS had begun to produce in 1927, and that had gone through 8 supplements (to the original 20 volumes) when I began in 1986. My predecessor, John William Ward, had thought that we needed a new book in order to bring the scholarship up to date, and in order to make the book more inclusive of the sorts of people who dominated the DAB – white, male political figures. As an American historian, I agreed, but I also wanted a book that was easier to use, and a book that would be useful in new ways. An electronic book, of course. Even a new analytical index could not make the 28 volumes of the DAB truly accessible, and comprehensive searching is not possible in the analog environment. Oxford University Press – New York, last month published the new book we planned in 1987, the American National Biography. The print version (for we have not abandoned print) contains 20 million words and 17,000 biographies in 24 large volumes. When I signed the contract with Oxford, we agreed upon the publication of a CD-ROM edition to complement the print version. For commercial purposes, however, the CD-ROM format is now virtually obsolete, so we will begin on-line publication of the ANB this July. But we will suffer from the uncertainties of commercial digital distribution at this stage of development, and will probably begin by distributing the ANB to site licensees (initially probably large academic and public libraries). We want individual access to the work, but at this time the technology of "pay by the drink" is not yet well enough developed for us to do so. The most exciting part of the project, I think, is its future. Both OUP and ACLS will return a portion of their profits to a quasi-endowment that will support, hopefully in perpetuity, an editorial office, the Center for American Biography, to undertake the writing of new biographies, revise old articles, and add image and sound to the existing database. The

electronic book is, of course, indefinitely expansible and infinitely revisable. This is information technology at its scholarly best, and I consider it my proudest accomplishment at ACLS.

Of course I had other electronic dreams, and I awoke from most of them with nothing but headaches. In the late 1980s I began to talk about a campaign for a congressional appropriation of $1 billion as a digitization fund – to do on a huge (and international) scale what David Seaman and his colleagues at your Electronic Text Center have done at the Alderman Library. Reality, in the form of the budget crunch and the Culture Wars, took hold very quickly. But another dream, mostly attributable to Pat Battin of the Commission on Preservation and Access did come true. This was the campaign to save as many acidic books as possible by converting them to microfilm. A coalition of humanities and library groups succeeded in convincing the Congress to expand the NEH annual budget substantially in order to undertake this work. The bad news is that we have lost and will lose millions of volumes of artefactual books, but the good news is that we have gained (through the capacity to digitize microfilm) a huge international database of information.

The brittle books campaign introduced me to the technique I think most crucial (and most unnatural) for the humanities in responding to the digital age – cooperation and collaboration. The classic image of the humanities scholar working alone with pencil and pad in a library or archive is not so far from the truth, even if the scholar now uses a computer and the Internet, for almost all scholarship in the humanities is single-authored. How many humanists in this audience have co-authored a book? An article? But how many of you who have engaged in digital projects have worked with other scholars and technologists? The same is true of the organizational humanities. We have kept to ourselves, largely in ACLS and the many learned societies. But this stance can no longer succeed if we are to secure public policies and compete for the resources necessary for us to do our work at a high level. Pencils and pads, and books in the library, are no longer enough to do our everyday teaching and research. We need equipment, programs, data and public policies that will sustain us. And our activity cannot continue to be based on individual campuses. We must work at a national and international level simply to maintain the current quality of our work.

The work with the Commission on Preservation and Access was only one of the collaborative experiences of the early years at ACLS. Jim Haas, then the President of the Council on Library Resources, approached me in about 1987 with a proposal to create a Research Library Committee composed of representatives from CLR, ACLS and the Association of American Universities. The idea was that an alliance of provosts, librarians and scholars was necessary to move the scholarly project ahead, since no one of these stakeholders could succeed on its own. Needless to say, one of the recurrent discussions in the Research Library Committee was about the impact of

technology on libraries and scholarship. It was a very good idea, but it did not produce concrete projects or results, and the Committee melted away over time. But we were developing other forums for cooperation, and doubtless the most important of them was the National Humanities Alliance, originally formed in response to the threat of Reagan budget cuts in the early 1980s. The Alliance was the first attempt to bring all of the elements of the national humanities community (state councils, learned societies, libraries, museums) together to build coalitions for the pursuit of public policy objectives, and it has been quite successful under the leadership of John Hammer. Once we secured the political survival of NEH, we were able to turn to more constructive tasks. In the IT area, NHA has been most active on questions of the revision of the laws of intellectual property, to which I will turn in a moment.

Both the Research Libraries Committee and the NHA experiences made clear to me the crucial nature of alliance with libraries and librarians. Humanists frequently have close relations with bibliographers and other specialized librarians, but the national humanities community has seldom acted in support of libraries. IT has transformed the "library" problem, since the library (whatever it is called) is the usual portal through which information flows into the university, especially now that the "information" we use is far more than the books and journals and manuscripts that have formed the historic basis for humanities scholarship. We need Internet access, large databases mounted inside and outside the library, document retrieval, and much more. Decisions about the acquisition and maintenance of information, and expert advice on how to use information now require humanists to have input into library decisions and access to librarian expertise in ways that transcend the traditional relationship of the humanities scholar to the library and the librarian.

I began to educate myself about such matters by working closely with the Association of Research Libraries (and especially its Executive Director, Duane Webster) and by joining the Board of the Research Libraries Group. I came to understand some of the problems of the technological transformation of the library and of the uses of electronic information. I became very aware of how little impact the humanities community had in the library and information world. Part of our problem was, of course, that much of the traditional community was campus-based and thought of the library only as a local resource – and even did little to try to influence on-campus library policies. But another part of the problem was that as a dramatically underfunded portion of the larger scholarly community, we humanists had little leverage on larger decisions about expenditures, technology or information policy. I realized that that would have to change if we were to do our jobs as scholars and teachers.

The question was what the right range of problems was, and who the proper allies might be. The larger problem no doubt, was simply how IT would transform

humanities scholarship, and we began to address that problem by collaborating in two conferences. The first was a conference on scholarship and technology in the humanities and sponsored by the British Library, the British Academy, ACLS, the Council on Library Resources and the Research Libraries Group, held at Elvethem Hall, outside of London, England around 1990. A quite diverse group of scholars, librarians, technologists and administrators met to survey the terrain, and, in the end, recommended a series of modest and sensible steps: international cooperation in the retrospective conversion of catalogues of holdings of printed texts, manuscripts and artifacts; online access to bibliographic databases; conversion of printed texts to machine-readable forms, standardization of formats for the electronic storage of humanities data (with the scholarly community retaining responsibility for selection of the data to be preserved); discussion of international copyright issues; and other matters.

In the fall of 1992 ACLS joined with the Art History Information Program of the Getty Trust, the Coalition for Networked Information, the Council on Library Resources and the Research Libraries Group to hold a follow-up to the Elvethem Hall conference in an attempt to create an action plan for humanities and technology in this country. The report of that conference (held at UC-Irvine) called for a number of actions, and led to a series of meetings that produced, in 1994, a large report entitled Humanities and Arts on the Information Highway: A National Initiative. Our objective at this point was to influence national policy on information, since the new Clinton administration was the first to focus on this crucial problem. Working with the Getty and CNI, in particular, our coalition began to reach beyond universities and libraries to the museum community, and we became concerned with a broader range of problems, including the digitization, storage and use of electronic images. The circle was growing larger, and "humanities" was being defined in a more catholic manner.

These efforts culminated, in 1996, in the formation of the National Initiative for a Networked Cultural Heritage (NINCH), currently based in Washington, D.C. and directed by David Green. NINCH was originally a collaboration of ACLS, AHIP and CNI, and was very much influenced by the charismatic librarian Paul Peters, the head of CNI and a person of extraordinary personal and intellectual range. The idea was to create a broad-based coalition of non-for-profit arts and humanities organizations committed to the preservation and use of the networked cultural heritage. The organization now has 69 members, including the founders, the American Association of Museums, the Library of Congress, the Smithsonian Institution, several learned societies and 38 member libraries of ARL – and it includes the Institute for Advanced Technology in the Humanities of this University. The organization began as a meeting ground for member organizations and their constituencies to exchange information on

a wide variety of subjects, ranging from standards for interoperability of systems and principles of intellectual property, to best practices in the electronic environment. NINCH was particularly useful in hammering out common understandings in the contentious period of revision of copyright law, and it has now become more pro-active in areas such as "best practices" in digitizing and networking material. But it is the question of copyright to which I now want to turn.

By the early 1990s, as the question of revising the Berne Convention on copyright, and therefore of revising domestic U.S. law, moved to the forefront of public policy debate, I became alarmed that the humanities community had little or no voice in the debate. The major subject matter in dispute was, and is, the extent to which property rights in digital information require different (and arguably greater) protection than intellectual property rights in analog information. To put the matter simply, if rightsholders felt threatened by a technology such as xerography, how were they to respond to the potential for reproduction in a purely electronic environment? Digital information is, after all, "copied" into a user's RAM, even if no further copying or transmission takes place – and digital copying requires only the flick of a finger. So the concern was not, and is not, frivolous. Two questions presented themselves. The first was what a sensible position on the question of property rights in digital information might be. The second was how a relatively powerless segment of the academic and cultural community might promote what it took to be a responsible position on the question. It is important to note, by the way, that most of the major humanities organizations (ACLS, the learned societies, historical societies, art museums and others) are simultaneously rightsholders and users of digital information.

There were and are many important principles at stake. One of them is the doctrine of First Sale, which is the principle whereby libraries (and others) can lend their material. But, for librarians, who of course exist on the basis of the First Sale doctrine, the most important principle in the old regime (codified in the Copyright Act of 1976) was that of "fair use," which says that users should have the right to copy, without the permission of the rightsholder, copyrighted information for certain purposes and in certain ways. Even under the old statute, there were serious limitations on fair use, but the basic compromise in this country was that there should be a balance between the rights of creators and owners and those of certain types of users, whose use was deemed to be in the public interest.

The principle of fair use seemed to be the right one even in a digital environment, and the librarians, ACLS and others attempted to organize in its defense. This was no small challenge, though, since it seemed as though both the Clinton administration (which viewed intellectual property as the most important potential export commodity of the United States) and big players in the commercial world (Microsoft and Viacom,

for starters) were proposing treaty and statutory language that would strengthen property rights, and that did not explicitly acknowledge fair use at all. For those of us who saw digital information as potentially the most democratic development in the history of the spread of knowledge, this seemed a looming disaster. We were active on two fronts. The first was in the process initiated by the Department of Commerce to bring together the major parties with an interest in the question of fair use in order to hammer out mutually agreeable guidelines – this was CONFU, or the Conference on Fair Use. The second was the international conference to revise the Berne treaties known by the name of the body entrusted with supervision of the international intellectual property rights system, WIPO (the World International Property Organization) held in Geneva, Switzerland in December, 1996.

Ironically, things went better for us in Geneva two years ago than in Washington, DC last year. ACLS was a member of the U.S. delegation to the WIPO negotiations, as were a few other organizations representing the non-profit and user communities. We were able to make common cause with the underdeveloped countries of the world, who feared being denied access to digital information, and with the major digital pipeline companies of the developed world, who feared information monopolies by rightsholders. We were odd bedfellows, but managed to secure WIPO acceptance of two treaties that more or less maintained the balance of rights that had existed previously. In Washington, more recently, we again worked with commercial interests opposed to digital information monopoly, and secured committee report language favorable to Fair Use. However, but the American statute, the Digital Millenium Copyright of 1998, fell far short of what we had sought, though the jury is still out on how the DMCA will turn out. The Act prohibits circumvention of technological protection measures that encrypt copyrighted material. But it also states that under Fair Use certain unauthorized uses are legal. To address this apparent inconsistency, the prohibition on circumventing the protection software is suspended for two years while the Library of Congress and the Copyright Office examine the implications of these protections on the exercise of Fair Use. I therefore consider the principle of Fair Use, and other allied doctrines, very much at risk in this country, and would urge anyone in the academic community who cares about the broad accessibility of digital information to become active in discussion of these questions. It is in fact only recently that the university community has recognized its stake in this struggle. This is an ongoing crisis little known to the humanities community, but absolutely central to its intellectual health.

I think that each of the ACLS activities I have described is characteristic of the dilemma of the humanities in the United States. We are a dispersed community with little sense of our communal interests, and with few mechanisms either to articulate or to effectuate those interests. During my tenure at ACLS, I was constantly engaged in

the process of assisting coalition formation. A different coalition was necessary for each issue, though many of the players surfaced repeatedly – ARL, CNI, CLR (now CLIR), AAU, AAUP (university presses, that is), the Getty Trust, the Andrew W. Mellon Foundation (which funded many of the activities I have described) and many international partners, such as the British Library and the British Academy.

Most recently my colleagues and I turned to the sciences, since it seemed obvious to many of us interested in digital information that we in the humanities fields suffered from the fact that the technology we used had been designed by others for others. Working with NINCH, CNI and the Two Ravens Project, ACLS turned to the Computer Science and Telecommunications Board of the National Research Council, and developed a partnership with its sponsoring body, the National Academy of Engineering. The NAE president, Bill Wulf (from U. Va. and a person who cares deeply about the humanities) and I chaired a meeting in Washington in the spring of 1997 to try to begin a dialogue between computer scientists and humanists on the potential for the use of digital technologies in humanities research and teaching. The meeting issued a report calling for continuing dialogue, further conferences, collaboration on the Digital Library Initiative competitions and, especially, for further attention to the problem of knowledge representation in the humanities. A steering group has now been appointed, and a series of concrete projects are being put into place. Perhaps the most interesting of these is called Building Blocks, a field-based hard look at the humanities, designed to articulate those intellectual and pedagogical needs – within each discipline as well as across the humanities as a whole – that can be met or transformed by computer science and information technology. Field-based workshops will be the "building blocks" used to create a platform and a vocabulary with which to construct practical agendas for working with computer scientists.

Another very important, cognate, effort is the Two Ravens Project that I have just mentioned. This is a fledging effort being constructed by Charles Henry, the librarian of Rice University. Henry was trained as a literary scholar, and has been one of our national leaders in thinking about the relationship of technology to humanities scholarship. Two Ravens is structured around two interrelated goals. The first is to provide a forum to explore the transformational changes of networked technology on the contemporary social fabric from the perspective of the humanities in order to better understand, integrate, and predict the effects of the emerging digital phenomena. The second is to allow current practitioners in the humanistic disciplines to manage the evolution of the humanities in an increasingly pervasive digital environment. Participants necessary to achieve both ends include scholars, teachers, and students from a variety of disciplines, including the social sciences, law, science and engineering, as well as representatives of government, business and industry. I

have been working with Henry on the project, and we hope to convene the first steering committee meeting early this summer in Princeton.

Let me now turn to my own discipline, history. Unskilled technologically as I am, alas, I am probably not on the trailing edge of technology in my own discipline. The American Historical Association recently surveyed history departments in the United States and Canada. The results have been better with each successive survey, but last year only 75% of departments reported that their entire faculty had access to the Internet. 78% reported that they considered the use of e-mail "very important" for their faculty, but a slightly lower percentage of departments reported that they had access to the World Wide Web. Nevertheless, the departments reported that 96% of U.S. faculty had access to e-mail and 92% to the World Wide Web. But the use of the Web for research and teaching was only judged "somewhat important" by most departments and nearly 10% reported that Web access was "not important." (Robert Townsend, "AHA Survey Indicates Growing Acceptance of Internet," AHA Perspectives, [February, 1999], p.5)

A recent H-Net electronic survey of individual users of the Internet among historians was more encouraging, although of course the entire sample had access to the Internet. All respondents were users of e-mail, and 93% used computers for research. 98% had computers in their office, with 91% having an Internet connection. But a sizeable minority reported that their students had inadequate computer access. 80% reported that they used technology in teaching, and 46% said they use e-mail in teaching courses. 44% require students to use the Internet for course work, but 23% reported concern about the reliability of such digital information. 54% devote significant class time to technical instruction of their students, and 47% have created web sites for their courses – though most of these appear to be rudimentary postings of syllabi and listings of e-links. About 20% of the respondents require their students to produce their own web sites, and "many" use computer labs to enable students to work with multimedia materials.

The author of an article about this survey says that 73% of respondents "worry that their present use of technology is inadequate or poorly conceived. They express concerns about out-dated technology, insufficient training, lack of release time, student resistance, negative impact upon tenure and promotion decisions, and unforeseen or negative effects upon the quality of their teaching. A number of faculty also reiterate deep concerns, already being widely heard, about how technology is being implemented and used on their campuses." (Dennis A. Trinkle, "Computers and the Practice of History," AHA Perspectives [February, 1999], pp. 31-34). This high rate of uncertainty and dissatisfaction probably reflects an as yet unarticulated frustration among historians that arises from being removed from information policy making and, thus, from not being in a position to better determine the use and

application of the technology. That is to say, in other words, that access and reasonably functional technological applications are simply not the most important questions for historians as scholars and teachers.

Whatever disappointment one might have in the magnitudes and modes of reported computer use among historians, there is no doubt that both access and usage have increased dramatically over the past decade. During the years I held a chair in the Princeton history department, 1978-1986, I was never provided a computer by the University and there was little university support for my computer use. In the early 1980s, my colleague Alan Kulikoff and I attempted to convince the University computing authorities to use a tiny amount of a substantial IBM grant to Princeton for a history department computer laboratory. We worked on the project for more than a year and finally got an agreement to establish the lab, but when we both left the University, the project vanished. There is still no history computer lab at Princeton, more than ten years later. But the overall-computing situation for historians at all American universities is vastly improved and faculty, especially younger faculty are using the technology. This is cause for optimism, but, again, the point needs to be made that what the surveys of computer usage show is little more than a concern with individualusage of technology. What they do not reveal is information about the more complex issue of technological change – how do we take charge of the technology and explore its implications for the humanities more deeply?

For myself, I have been permitted to return to my University, and I am cheerfully continuing my teaching and research. My "extracurricular" activities are mainly centered on the IT project and the humanities. For the moment, most of my energy is focused on the American Historical Association, which has sentenced me to three years as its Vice President for Research. You will not be surprised to hear that I have challenged the Research Division to consider the impact of IT on history its major task under my administration. And we are making some interesting progress. We have oversight responsibility for the journal of the Association, the American Historical Review, and we have been working with its editor, Michael Grossberg, to bring the journal online. The AHR began that project by co-hosting, in the summer of 1997, a conference on electronic history journals. We are working our way through the technical (not so hard) and financial (very hard) problems of conversion to digital format, and we hope to begin the new format (simultaneous with print) in 2001. Further, under the leadership of our new president, Robert Darnton, we have just secured a major grant from the Mellon Foundation for a project to publish prize dissertations as electronic monographs. The AHA is also working with ACLS and several other historical societies to establish a project for the publication of electronic monographs in history. The AHA is even about to publish its membership directory online for the first time. These are all modest projects from the point of view of IT,

but the humanities fields may need to move with deliberate speed in an environment that too frequently fears the loss of the codex more than it anticipates the benefits of newer technologies.

I am aware, as you are, of the opposition to IT in the academic world. I read with interest the Chronicle of Higher Education's May 8 article on a conference in California organized by my friend David F. Noble, one of the finest historians of technology. The article was headlined, "Skeptical Academics See Perils in Information Technology," and I gather the conference focused on the costs of technology, the possibility of professorial job displacement, and the ineffective use of academic technology. These are all real problems, and when it comes to the potential abuses of distance education, I am on the side of the critics. The budget questions are real ones, for despite the famously declining cost of computer hardware, the cost of information technology is the fastest growing part of university budgets. In libraries the cost of technology frequently forces tradeoffs between machines and books – Elsevier is not the only enemy of book acquisitions, after all. Anyone who has read the wonderful book by Edward Tenner, Why Things Bite Back: Technology and the Revenge of Unintended Consequences (NY, Knopf, 1996), knows that technology has its dark underside.

The Chronicle actually ran an earlier article, on April 3, 1998, with another take on the problem. In this article the headline told us that the "'Technorealists' Hope to Enrich Debate Over Policy Issues in Cyberspace," and the sub-head went on to say that "They issue a set of principles for a middle ground between techno-utopians and neo-Luddites." Well, I think that this sort of Manicheanism does not help us in evaluating the prospects for IT in the academy. I have already said that I think the future is here, and that it (mostly) works. But I frequently cannot open attachments, interoperability is still a dream, user rights to digital information are insecure and I still prefer to read a codex – and so do all of you. On the other hand, there are really very few Luddites out there. I would be surprised if David Noble does not write his attacks on technology on a computer, and I know that he uses e-mail.

The challenge to us, particularly in the humanities community, is to determine how best we can use the technology to achieve our traditional purposes. We must drive the technology, rather than the other way around. In order to do so we must understand the implications of the technology much better than we do at present; we must organize ourselves to act on what we decide we need and we must seek out appropriate collaborations. I think I have said enough to indicate how dim I think the prospects for the humanities are if we do not adopt proactive agendas and if we continue to go along a path of relative isolation and individualistic research without confronting the deeper, long term implications if IT.

Those of you in this audience who are humanists live in my dream world. The University of Virginia is, so far as I can tell, the best place for applying information technology to what humanists do. John Unsworth and his Institute, and David Seaman and his Center, are the units I know best. They are surely at the forefront of efforts to apply technology to the humanities, and have attracted attention internationally in the scholarly world of the humanities. But I have also heard praise for Edward Gaynor's Special Collections Digital Center and for Rick Provine's Digital Media Center. I understand that Ed Ayers has established a new Virginia Center for Digital History. I doubt that we would have the important digital scholarship Jerry McGann and Ed Ayers have produced without the remarkable and growing infrastructure built and maintained at this University. It is, so far as I am concerned, the model for the rest of us and I wish that something comparable existed at Princeton. But now we need you at the University of Virginia help the rest of the humanities community to enter the Promised Land. It will not be easy or swift. But I think we do know generally where to go.

Thank you.