the computer screen are virtual, rather than real. In a similar manner, the reader experiences the virtual presence of other contributors.

Such virtual presence is of course a characteristic of all technology of cultural memory based on writing and symbol systems. Since we all manipulate cultural codes—particularly language but also mathematics and other symbols—in slightly different ways, each record of an utterance conveys a sense of the one who makes that utterance. Hypermedia differs from print technology, however, in several crucial ways that amplify this notion of virtual presence. Because the essential connectivity of hypermedia removes the physical isolation of individual texts characteristic of print technology, the presence of individual authors becomes both more available and more important. The characteristic flexibility of this reader-centered information technology means, quite simply, that writers have a much greater presence in the system, as potential contributors and collaborative participants but also as readers who choose their own paths through the materials.

The virtual presence of other texts and other authors contributes importantly to the radical

**Collaborative Writing.** reconception of authorship, authorial property, and collaboration associated with hypertext.

**Collaborative Authorship** Within a hypertext environment all writing becomes collaborative writing, doubly so. The first element of collaboration appears when one compares the roles of writer and reader, since the active reader necessarily collaborates with the author in producing a text by the choices he or she makes. The second aspect of collaboration appears when one compares the writer with other writers—that is, the author who is writing *now* with the virtual presence of all writers “on the system” who wrote *then* but whose writings are still present.

The word *collaboration*, which derives from the Latin for *working* plus that for *with* or *together*, conveys the suggestion, among others, of working side by side on the same endeavor. Most people’s conceptions of collaborative work take the form of two or more scientists, songwriters, or the like continually conferring as they pursue a project in the same place at the same time. I have worked on an essay with a fellow scholar in this manner. One of us would type a sentence, at which point the other would approve, qualify, or rewrite it, and then we would proceed to the next sentence. Far more common a form of
of a graduate student's research for his dissertation, he or she may receive continual advice and evaluation. When the student's project bears fruit and appears in the form of one or more publications, the advisor's name often appears as co-author.

Not so in the humanities, where graduate student research is supported largely by teaching assistantships and not, as in the sciences, by research funding. Although an advisor of a student in English or art history often acts in ways closely paralleling the advisor of the student in physics, chemistry, or biology, explicit acknowledgments of cooperative work rarely appear. Even when a senior scholar provides the student with a fairly precise research project, continual guidance, and access to crucial materials that the senior scholar has discovered or assembled, the student does not include the advisor as co-author.

The marked differences between conceptions of authorship in the sciences and the humanities demonstrate the validity of Michel Foucault's observation that "the 'author-function' is tied to the legal and institutional systems that circumscribe, determine, and articulate the realm of discourses; it does not operate in a uniform manner in all discourses, at all times, and in any given culture it is not defined by the spontaneous attribution of a text to its creator, but through a series of precise and complex procedures; it does not refer, purely and simply, to an actual individual" ("Author," 131). One reason for the different conceptions of authorship and authorial property in the humanities and the sciences lies in the different conditions of funding and the different discipline-politics that result.

Another corollary reason is that the humanistic disciplines, which traditionally apply historical approaches to the areas they study, consider their own assumptions about authorship, authorial ownership, creativity, and originality to be eternal verities. In particular, literary studies and literary institutions, such as departments of English, which still bathe themselves in the afterglow of Romanticism, uncritically inflate Romantic notions of creativity and originality to the point of absurdity. An example comes readily to hand from the preface of Lisa Ede and Andrea Lunsford's recent study of collaborative writing, the production of which they discovered to have involved "acts of subversion and of liberatory significance": "We began collaborating in spite of concerned warnings of friends and colleagues, including those of Edward P. J. Corbett, the person in whose honor we first wrote collaboratively. We knew that our collaboration represented a
of a separate, unique text that is the product—and hence the property—of one person, the author. Hypertext changes all this, in large part because it does away with the isolation of the individual text that characterizes the book. As McLuhan and other students of the cultural influence of print technology have pointed out, modern conceptions of intellectual property derive both from the organization and financing of book production and from the uniformity and fixity of text that characterize the printed book. J. David Bolter explains that book technology itself created new conceptions of authorship and publication:

Because printing a book is a costly and laborious task, few readers have the opportunity to become published authors. An author is a person whose words are faithfully copied and sent around the literary world, whereas readers are merely the audience for those words. The distinction meant less in the age of manuscripts, when "publication" was less of an event and when the reader's own notes and glosses had the same status as the text itself. Any reader could decide to cross over and become an author: one simply sat down and wrote a treatise or put one's notes in a form for others to read. Once the treatise was written, there was no difference between it and the works of other "published" writers, except that the more famous works existed in more copies. (Writing Space, 48-49)

Printing a book requires a considerable expenditure of capital and labor, and the need to protect that investment contributes to notions of intellectual property. But these notions would not be possible in the first place without the physically separate, fixed text of the printed book. Just as the need to finance printing of books led to a search for the large audiences that in turn stimulated the ultimate triumph of the vernacular and fixed spelling, so, too, the fixed nature of the individual text made possible the idea that each author produces something unique and identifiable as property.¹⁸

The needs of the marketplace, at least as they are conceived by editors and publishing houses, reinforce all the worst effects of these conceptions of authorship in both academic and popular books. Alleen Pace Nilsen reports that Nancy Mitford and her husband wrote the best-selling High Cost of Death together, but only her name appears because the publisher urged that multiple authors would cut sales. In another case, to make a book more marketable a publisher replaced the chief editor of a major psychiatric textbook with the name of a prestigious contributor who had not edited the volume at all (cited
challenge to traditional research conventions in the humanities. Andrea's colleagues (at the University of British Columbia) said so when they declined to consider any of her coauthored or coedited works as part of a review for promotion.

Ede and Lunsford, whose interest in their subject grew out of the "difference between our personal experience as coauthors and the responses of many of our friends and colleagues" (5), set the issue of collaborative writing within the contexts of actual practice in the worlds of business and academia, the history of theories of creative individualism and copyright in recent Western culture, contemporary critical theory, particularly that of Bakhtin, Barthes, and Foucault, and feminist analyses of many of these other contexts. They produce a wide range of evidence in convincingly arguing that "the pervasive commonsense assumption that writing is inherently and necessarily a solitary, individual act" (5) supports a traditional patriarchal construction of authorship and authority. After arguing against "univocal psychological theories of the self" (132) and associated notions of an isolated individualism, Ede and Lunsford call for a more Bakhtinian conception of the self and for what they term a dialogic, rather than a hierarchical, mode of collaboration.

I shall return to their ideas when I discuss the role of hypertext in collaborative learning, but now I wish to point out that as scholars from McLuhan and Eisenstein to Ede and Lunsford have long argued, book technology and the attitudes it supports are the institutions most responsible for maintaining exaggerated notions of authorial individuality, uniqueness, and ownership that often drastically falsify the conception of original contributions in the humanities and convey distorted pictures of research. The sciences take a relatively expansive, inclusive view of authorship and consequently of text ownership. The humanities take a far more restricted view that emphasizes individuality, separation, and uniqueness—often creating a vastly distorted view of the connection of a particular text to those that preceded it. Neither view possesses an obvious rightness. Each is obviously a social construction, and each has on occasion proved to distort actual conditions of intellectual work carried out in a particular field.

Whatever the political, economic, and other discipline-specific factors that maintain the conception of noncooperative authorship in the humanities, print technology has also contributed to the sense
Reconfiguring the Author

collaboration, I suspect, is a second mode, described as “versioning,”¹² in which one worker produces a draft that another person then edits by modifying and adding. The first and the second forms of collaborative authorship tend to blur, but the distinguishing factor is that versioning takes place out of the presence of the other collaborator and at a later time.

Both of these models require considerable ability to work productively with other people, and evidence suggests that many people either do not have such ability or do not enjoy putting it into practice. In fact, according to those who have carried out experiments in collaborative work, a third form proves more common than the first two—the assembly-line or segmentation model of working together, according to which individual workers divide the overall task and work entirely independently. This last mode is the form that most people choose when they work on collaborative projects, ranging from programming to art exhibitions.

Networked hypertext systems like Intermedia offer a fourth model of collaborative work that combines aspects of the previous ones. By emphasizing the presence of other texts and their cooperative interaction, networked hypertext makes all additions to a system simultaneously a matter of versioning and of the assembly-line model. Once ensconced within a network of electronic links, a document no longer exists by itself. It always exists in relation to other documents in a way that a book or printed document never does and never can. From this crucial shift in the way texts exist in relation to others derive two principles that, in turn, produce this fourth form of collaboration: first, any document placed on any networked system that supports electronically linked materials potentially exists in collaboration with any and all other documents on that system; second, any document electronically linked to any other document collaborates with it.

According to the American Heritage Dictionary of the English Language, the verb to collaborate can mean either “to work together, especially in a joint intellectual effort” or “to cooperate reasonably, as with an enemy occupying one’s country.” The combination of labor, political power, and aggressiveness that appears in this dictionary definition well indicates some of the problems that arise when one discusses collaborative work. On the one hand, the notion of collaboration embraces notions of working together with others, of forming a community of action. This meaning recognizes, as it were, that
we all exist within social groups, and it obviously places value on contributions to that group. On the other hand, collaboration also includes a deep suspicion of working with others, something aesthetically as well as emotionally engrained since the advent of romanticism, which exalts the idea of individual effort to such a degree that it often fails to recognize, or even suppresses, the fact that artists and writers work collaboratively with texts created by others.

Most of our intellectual endeavors involve collaboration, but we do not always recognize the fact for two reasons. The rules of our intellectual culture, particularly those that define intellectual property and authorship, do not encourage such recognitions; and furthermore, information technology from Gutenberg to the present—the technology of the book—systematically hinders full recognition of collaborative authorship.

Throughout this century the physical and biological sciences have increasingly conceived of scientific research, authorship, and publication as group endeavors. The conditions of scientific research, according to which many research projects require the cooperating services of a number of specialists in the same or (often) different fields, bear some resemblances to the medieval guild system in which apprentices, journeymen, and masters all worked on a single complex project. Nonetheless, “collaborations differ depending on whether the substance of the research involves a theoretical science, such as mathematics, or an empirical science, such as biology or psychology. The former are characterized by collaborations among equals, with little division of labor, whereas the latter are characterized by more explicit exchange of services, and more substantial division of labor.”

The financing of scientific research, which supports the individual project, the institution at which it is carried out, and the costs of educating new members of the discipline all nurture such group endeavors and consequent conceptions of group authorship.

In general, the scientific disciplines rely upon an inclusive conception of authorship: anyone who has made a major contribution to finding particular results, occasionally including specialized technicians and those who develop techniques necessary to carry out a course of research, can appear as authors of scientific papers, and similarly, those in whose laboratories a project is carried out may receive authorial credit if an individual project and the publication of its results depend intimately upon their general research. In the course
by Ede and Lunsford, 3–4). I am sure all authors have examples of such distortion of authorial practice for what a publisher believes to be good business. I have mine: a number of years ago after an exercise in collaborative work and writing with three graduate students produced a publishable manuscript, we decided mutually upon the ordering of our names on the title page.19 By the time the volume appeared, the three former graduate students all held teaching positions, and the book’s appearance, one expects, might have helped them professionally. Unfortunately, the publisher insisted upon including only the first editor’s name in all notices, advertisements, and catalogues. Such an action, of course, does not have so serious an effect as removing the editors’ names from the title page, but it certainly discriminates unfairly between the first two editors, who did equal amounts of work, and it certainly conveys a strong message to beginning humanists about the culturally assigned value of cooperation and collaboration.

Even though print technology is not entirely or even largely responsible for current attitudes in the humanities toward authorship and collaboration, a shift to hypertext systems would change them by emphasizing elements of collaboration. As Tora K. Bikson and J. D. Eveland point out in relation to other, nonhumanities work, “the electronic environment is a rich context in which doing work and sharing work become virtually indistinguishable.”20 If we can make ourselves aware of the new possibilities created by these changes, we can at the very least take advantage of the characteristic qualities of this new form of information technology.

One relevant characteristic quality of networked hypertext systems is that they produce a sense of authorship, authorial property, and creativity that differs markedly from those associated with book technology. Hypertext changes our sense of authorship and creativity (or originality) by moving away from the constrictions of page-bound technology. In so doing, it promises to have an effect on cultural and intellectual disciplines as important as those produced by earlier shifts in the technology of cultural memory that followed the invention of writing and printing.21