Rights, Camera, Action:

Cyberspatial Settings and the First Amendment

M. Ethan Katsh[†]

> Visit the Pentagon, or the *New York Times*, and everywhere there are
> maps, solemnly defining national borders and sovereign territories. No
> one shows any signs of knowing that we no longer live in geographic
> time and space, that the maps of nations are fully as obsolete as the
> charts of a flat earth, that geography tells us virtually nothing of
> interest about where things are in the real world.[1]

<div align="right">George Gilder</div>

> Each technology gives us a different space.[2]

<div align="right">Jay David Bolter</div>

Consider the experience of the anthropologist Edward Hall. Some years
ago, while on a research trip to Japan, Hall returned to his hotel one day, went
up to his room, opened the door, and found that while it was the room he had
been living in, someone else's belongings were there. Hall took this in for a
few moments, all the time feeling uncomfortable, indeed feeling that somehow
he must be in the wrong place, and that he would be found and accused of
being in someone else's room. He then went down to the desk where he was
told that his room and his belongings had been moved. He was given a new
key, went up to his new room, and found that all of his possessions had been
laid out for him in just about the same way he had left them in the first room.

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   1. GEORGE GILDER, THE MESSAGE OF THE MICROCOSM (1989), *quoted in* RAYMOND KURZWEIL, THE
AGE OF INTELLIGENT MACHINES 445 (1990).
   2. JAY DAVID BOLTER, WRITING SPACE: THE COMPUTER, HYPERTEXT, AND THE HISTORY OF
WRITING 11 (1991) [hereinafter BOLTER, WRITING SPACE].

There was a marked resemblance to the room and the arrangement and yet, he could feel, much was different as well.[3]

As an anthropologist Professor Hall understood that what was important about his experience went beyond the nature of the artifacts in his new space. He realized that he was not only in an unfamiliar physical place but that he was in a culture and environment that he did not understand completely. He was no longer confident in what he could expect to occur in this space. Whose space was this, for example, and might he be moved again? Hall realized that the new environment had physical resemblances to what was familiar to him, but he also recognized that, because of strong environmental or cultural forces, his role as tourist/guest/renter had changed. Long-held assumptions about hotels no longer seemed to be valid and he became aware that his relationship with the hotel was different from what he had assumed it to be. What was his, what was shared, and what belonged to others were no longer as clear as they once had been.

Professor Hall, as he adapted to his new space, continued to wonder about what his new surroundings signified. He eventually left Tokyo, where the first hotel had been located, and visited Kyoto. He writes:

> There we were fortunate enough to stay in a wonderful little country inn on the side of a hill overlooking the town. Kyoto is much more traditional and less industrialized than Tokyo. After we had been there about a week and had thoroughly settled into our new Japanese surroundings, we returned one night to be met at the door by an apologetic manager who was stammering something. I knew immediately that we had been moved, so I said, "You had to move us. Please don't let this bother you, because we understand. Just show us to our new rooms and it will be all right." Our interpreter explained as we started to go through the door that we weren't in that hotel any longer but had been moved to *another* hotel. What a blow! Again, without warning. We wondered what the new hotel would be like, and with our descent into the town our hearts sank further. Finally, when we could descend no more, the taxi took off into a part of the city we hadn't seen before. No Europeans here! The streets got narrower and narrower until we turned into a side street that could barely accommodate the tiny Japanese taxi into which we were squeezed. Clearly this was a hotel of another class. I found that, by then, I was getting a little paranoid, which is easy enough to do in a foreign land, and said to myself, "They must think we are very low-status people indeed to treat us this way."
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> As it turned out, the neighborhood, in fact the whole district, showed us an entirely different side of life from what we had seen before, much more interesting and authentic. True, we did have some

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3. EDWARD T. HALL, BEYOND CULTURE 50–51 (1976).

communication problems, because no one was used to dealing with foreigners, but few of them were serious.[4]

Hall again understood that what was causing him difficulty was not only the physical inconvenience of being moved but his concern over what it meant that he had been moved. Any space, he realized, was not simply a physical location but a cultural environment with embedded norms and values. Ultimately, he learned that being moved did not have the same significance as being moved might have in the United States. Hotel space looked the same but it was being governed by some different conventions and values. Indeed, far from according him a low status, he learned that the hotel managers who moved him were treating him quite respectfully. He writes that "[t]he fact that I was moved was tangible evidence that I was being treated as a family member—a relationship in which one can afford to be 'relaxed and informal and not stand on ceremony.'"[5]

This Essay focuses more on how to understand and approach the new information technologies than on how to regulate them. As the title of this Symposium indicates, we are in a period of "emerging technologies." In Part I of this Essay, I suggest that these new technologies are not simply tools or functional artifacts but are the components of a new cultural space. New technologies change our relationship with information, as well as our capabilities for working with information. In this new environment or space there are similarities with how information was used in the past, but there are also new assumptions and expectations about information and new uses for information that have implications for the future of the First Amendment.[6]

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4. *Id.* at 51–52.

5. *Id.* at 56.

6. My approach and conclusions both converge with and diverge from several provocative works of Ronald Collins and David Skover. *See* Ronald K.L. Collins & David M. Skover, *Commerce and Communication*, 71 TEX. L. REV. 697 (1993); Ronald K.L. Collins & David M. Skover, *Paratexts*, 44 STAN. L. REV. 509 (1992); Ronald K.L. Collins & David M. Skover, *Pissing in the Snow: A Cultural Approach to the First Amendment*, 45 STAN. L. REV. 783 (1993) [hereinafter Collins & Skover, *Cultural Approach*] (reviewing JAMES TWITCHELL, CARNIVAL CULTURE: THE TRASHING OF TASTE IN AMERICA (1992)); Ronald K.L. Collins & David M. Skover, *The First Amendment in an Age of Paratroopers*, 68 TEX. L. REV. 1087 (1990). Collins and Skover's *Paratexts* article emphasizes the influence of media on law and, more particularly, the role played by print, a point I also focused on in M. ETHAN KATSH, THE ELECTRONIC MEDIA AND THE TRANSFORMATION OF LAW (1989) [hereinafter KATSH, ELECTRONIC MEDIA]. We start, therefore, from a similar perspective on the critical role of media in shaping much of what law is and how it works. Similarly, in the First Amendment context, I share their belief that "the First Amendment is more than law. It is a way of life," Collins & Skover, *Cultural Approach, supra,* at 783, and that it is necessary "to reflect upon the culture of free expression," *id.* at 785.

    While we agree on the highly significant role that media play in the law and that analyses of many kinds of legal issues need to begin with an understanding of media, our ideas of what qualities of the electronic media will be influential in the future are quite divergent. For Collins and Skover, the paradigm is television and the currently prevailing communications model of the mass media. Their conclusions about the nature and flow of information assumes a mass medium dominated by commercial concerns. The electronic media, as I consider them, are oriented around the computer and around technology that, for reasons explained later in this Essay, is displacing the mass media as it is described by Collins and Skover. In their one reference to the computer, they write:

Part II describes four technological capabilities of the new media that set the new "electronic culture" apart from "print culture" and that alter the context in which different First Amendment issues will arise and be considered. Computer networks, interactive machines, new modes of visual communication, and hypertext expand individual and group opportunities for working with information and, in the process, build an environment that contrasts significantly with "print culture." Part III reviews some historical links between print and the First Amendment and focuses attention on two facets of the new electronic culture that have First Amendment implications: the emergence of new metaphors to describe the informational environment with which the First Amendment is concerned, and the development of new entities and relationships that are being fostered by the new media and by what is increasingly being labeled as cyberspace.[7]

[W]hat if technological advances could "demassify" the predominant form of communication in our culture? For example, the invention of a "telecomputer" system, a digitally-switched fiber optic computer network, heralds a communications revolution. The potential of such technologies is so powerful that, in the view of George Gilder of the Discovery Institute, "[t]he age of television, for all intents and purposes, [is] over." Unlike today's broadcasting system, he adds, the new technology promises an untold number of personalized electronic possibilities, ranging from interactive audio-video communication to a plethora of program selections. With utopian expectations, Gilder believes that the telecomputer "may even reverse the effects of the television age. . . . Rather than exalting mass culture, the telecomputer will enhance individualism. Rather than cultivating passivity, the telecomputer will promote creativity." From Gilder's perspective, Twitchell's Carnival is closing down. The telecomputer, we are assured, will arrest television's "endless flow of minor titillations."

Id. at 800 (footnotes omitted) (quoting GEORGE GILDER, LIFE AFTER TELEVISION: THE COMING TRANSFORMATION OF MEDIA AND AMERICAN LIFE 31 (1992)).

Unlike myself, Collins and Skover reject the displacement of television by the digital information technologies. The clash of the television perspective and the computer perspective is an intriguing one and only time will tell who is correct about the future. Clearly, however, one's choice of either television or the computer as a paradigm leads to very different conclusions about many First Amendment concerns.

7. Cyberspace is a term coined by science fiction writer William Gibson in 1984. Gibson wrote:
   Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation . . . . A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding . . . .

WILLIAM GIBSON, NEUROMANCER 51 (1984).

Cyberspace is still a term lacking a generally accepted meaning. I use it as a designation for a mature electronic culture, where electronic networks are much more fully established than they are today, where many different kinds of data and stimuli can be communicated instantaneously around the globe, and where the electronic means at our disposal to acquire and process information are richer and more developed than they are today. Cyberspace includes both the tools that allow for information to be used in new ways and the cultural elements that dictate how these tools are employed and understood in a culture that is oriented around information in digital form rather than information in print. M. ETHAN KATSH, LAW IN A DIGITAL WORLD 29 (1995); *see also* Dan L. Burk, *Patents in Cyberspace: Territoriality and Infringement on Global Computer Networks*, 68 TUL. L. REV. 1 (1993); Eric Schlachter, *Cyberspace, The Free Market and the Free Marketplace of Ideas: Recognizing Legal Differences in Computer Bulletin Board Functions*, 16 HASTINGS COMM. & ENT. L.J. 87, 89 (1993); Edward J. Naughton, Note, *Is Cyberspace A Public Forum? Computer Bulletin Boards, Free Speech, and State Action*, 81 GEO. L.J. 409 (1992); Note, *The Message in the Medium: The First Amendment on the Information Superhighway*, 107 HARV. L. REV. 1062, 1087 (1994) [hereinafter Note, *Message in Medium*].

I. DISPLACEMENT AND THE CULTURE OF CYBERSPACE

The new technologies, in ways I shall explain below, enable us to expand our capabilities for processing, storing, organizing, representing, and communicating information in rather extraordinary ways. In this transition period it is not surprising that these technologies are perceived as tools, as hardware and software, as artifacts whose primary impact is to accelerate greatly the performance of informational tasks. Yet, as electronic technologies displace print technologies as the principal means for *working* with information, they also displace print as the principal means for *thinking* about information. As I shall explain below, new technologies influence the cultural as well as the physical. In addition to providing new opportunities for working with information, they contribute to shifts in the value of information, in the language used to describe information, in customs used to employ information, in expectations about how information will be used, and in norms that are applied to information and communication.[8]

The theme of this Essay is that the challenge posed by the new technologies to the First Amendment is cultural[9] as well as doctrinal.[10] While doctrine evolves over time as a result of legislative or judicial actions, a new technology changes the backdrop against which constitutional conflicts arise. As Frederick Schauer has observed, "Legal rules and principles commonly

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8. In the changing culture of information, we will have to confront information that is copied as it is communicated, that, unlike information that is static and fixed, can be reworked with ease, and that increases in value as it is processed but may decrease in value if it is hidden away. John Perry Barlow draws an analogy between electronic information and sharks, who

are said to die of suffocation if they stop swimming, and the same is nearly true of information. Information that isn't moving ceases to exist as anything but potential . . . at least until it is allowed to move again. For this reason, the practice of information hoarding, common in bureaucracies, is an especially wrong-headed artifact of physically based value systems.

John Perry Barlow, *The Economy of Ideas: A Framework for Rethinking Patents and Copyrights in the Digital Age*, WIRED, Mar. 1994, at 84, 89.

9. My perspective on the cultural impact of a new medium of communication has been influenced greatly by the following works: J. DAVID BOLTER, TURING'S MAN: WESTERN CULTURE IN THE COMPUTER AGE (1984); ELIZABETH EISENSTEIN, THE PRINTING PRESS AS AN AGENT OF CHANGE (1979); ERIC A. HAVELOCK, PREFACE TO PLATO (1963); ERIC A. HAVELOCK, THE GREEK CONCEPT OF JUSTICE (1978); HAROLD A. INNIS, EMPIRE AND COMMUNICATIONS (1950); HAROLD A. INNIS, THE BIAS OF COMMUNICATION (1951); LITERACY IN TRADITIONAL SOCIETIES (Jack Goody ed., 1968); MARSHALL MCLUHAN, THE GUTENBERG GALAXY: THE MAKING OF TYPOGRAPHIC MAN (1962); MARSHALL MCLUHAN, UNDERSTANDING MEDIA (1964); JOSHUA MEYROWITZ, NO SENSE OF PLACE: THE IMPACT OF ELECTRONIC MEDIA ON SOCIAL BEHAVIOR (1985); WALTER J. ONG, INTERFACES OF THE WORD: STUDIES IN THE EVOLUTION OF CONSCIOUSNESS AND CULTURE (1977); WALTER J. ONG, ORALITY AND LITERACY: THE TECHNOLOGIZING OF THE WORD (1982); EDWARD R. TUFTE, ENVISIONING INFORMATION (1990); EDWARD R. TUFTE, THE VISUAL DISPLAY OF QUANTITATIVE INFORMATION (1983) [hereinafter TUFTE, VISUAL DISPLAY].

10. My concern in this Essay is more with the background against which cases and controversies are arising than with predicting how any particular court will decide any particular case. In a transition period, court decisions may be consistent with earlier decisions, but this does not necessarily mean that they will determine or be consistent with later decisions. There are areas of First Amendment doctrine that are more likely to flower into controversy than other areas, and I note these in a series of footnotes. *See infra* notes 43, 48, 59, and 64. These areas include prior restraint, commercial speech, obscenity, access rights, and rights of reply.

contain not only normative determinations about what ought or ought not happen under certain circumstances, but also background factual assumptions about the nature of the world."[11] Whether we are in a new room or a new hotel may not yet be clear, but whatever space we are entering contains different understandings about the role and nature of information, different institutions for communicating information, different assumptions about the use of information, different customs about the propriety of information use, and, perhaps, different goals for regulating information. As cyberspace continues to be developed it will increasingly be the place where information transactions of all kinds occur and it will be a place that affects our understanding and valuation of informational activities occurring in physical places.

For those actively involved with the new technologies, there is a growing awareness that we have moved and are in a new place that provides new capabilities, opportunities, and experiences. Joshua Meyrowitz has pointed out that "media, like physical places, include and exclude participants. Media, like walls and windows, can hide and they can reveal. Media can create a sense of sharing and belonging or a feeling of exclusion and isolation."[12] For this reason, he suggests:

> [P]hysical settings and media "settings" are part of a continuum rather than a dichotomy. Places and media both foster set patterns of interaction among people, set patterns of social information flow.
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> Thus, while places create one type of information-system—the live encounter—there are many other types of situations created by other channels of communication. This wider view of situations as information-systems, rather than as places, is especially relevant to the study of *electronic* media because electronic media have tended to diminish the differences between live and mediated interaction. The speech and appearance of others are now accessible without being in the same physical location. The widespread use of electronic media leads to many new social situations.[13]

This influence of media on space should not be surprising since, as will be explained below, the electronic media treat distance very differently than does any previous medium of communication.[14] Although they are widely perceived to have their primary impact on time, by accelerating how long it takes to perform informational tasks, the most significant influence of the new media will be on the dimension of space, by making what was distant and

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11. Frederick Schauer, *Free Speech and the Demise of the Soapbox*, 84 COLUM. L. REV. 558, 558 (1984) (reviewing ITHIEL DE SOLA POOL, TECHNOLOGIES OF FREEDOM (1983)).

12. MEYROWITZ, *supra* note 9, at 7.

13. *Id.* at 38.

14. *See generally* KATSH, *supra* note 7; WILLIAM J. MITCHELL, CITY OF BITS: SPACE, PLACE, AND THE INFOBAHN (1995). There are no page number references here for *City of Bits* because the source I used was the electronic version of the book, available online at URL <http://alberti.mit.edu/ arch/4.207/texts/city-of-bits-toc.html>.

unreachable appear close and useable. The new media render impotent many different kinds of boundaries, ranging from the physical and geographical to the conceptual and professional, and challenge us to "come to terms with what it means to be in an information age."[15] It is more as a result of their impact on space and boundaries than of their effect on time and speed that "[t]he move to electronic communication [is] a turning point that history will remember."[16] It is their impact on space that accounts for the appropriateness of the term "cyberspace."

As print space becomes electronic space, we will, with increasing frequency, be asked about revising, extending, and interpreting familiar First Amendment doctrines. Cyberspace, because so many information transactions of value occur in it, will not be a harmonious place. The new media provide a setting in which levels of conflict and disputing involving information and communication will be high and our attention, quite understandably, will be focused primarily on specific disputes and on replacing or adapting various kinds of doctrines. Yet, at the same time, the role, value, and use of information are also changing. Our economy is increasingly global, not national, and is highly focused on both producing information and protecting information.[17] Information is produced more quickly than before and also becomes obsolete more quickly than before. Our language is changing, as new metaphors develop to enable us to describe qualities of the new environment.[18]

In general, in terms of information, much of what was scarce is becoming abundant, much of what was distant is coming closer, much of what was secret is opening up. These trends support many broad First Amendment goals and interests by expanding capabilities for working with information and by removing many controls over communication that are inherent in print.[19] As I shall explain below,[20] however, there are also some reasons for concern about the First Amendment as our language begins to reflect new kinds of informational experiences, as new entities and institutions become involved in

15. ANNE WELLS BRANSCOMB, WHO OWNS INFORMATION? FROM PRIVACY TO PUBLIC ACCESS 1 (1994).

16. ITHIEL DE SOLA POOL, TECHNOLOGIES OF FREEDOM 10 (1983).

17. One revealing law-related example of the changing value of information is the ongoing controversy over whether the page numbers of West Publishing Company reporters are copyrightable. In an economy oriented around adding value to information, even page numbers can be highly valuable. *See* Carl J. Khalil, *Are Page Numbers Really Copyrightable? The Effect of* Feist *on the* West Publishing v. Lexis *Case*, 76 J PAT. & TRADEMARK OFF. SOC'Y 807 (1994); L. Ray Patterson & Craig Joyce, *Monopolizing the Law: The Scope of Copyright Protection for Law Reports and Statutory Compilations*, 36 UCLA L. REV. 719 (1989). Susan Hansen, *Fending off the Future*, AM. LAW., Sept. 1994, at 74, 74.

18. We already have a long list of metaphors for cyberspace, such as the common ones of a highway or frontier, a library, and the less common ones such as a church, a luncheon table, kudzu, or, more negatively, a compost heap.

19. M. Ethan Katsh, *The First Amendment and Technological Change: The New Media Have a Message*, 57 GEO. WASH. L. REV. 1459 (1989).

20. *See infra* part III.A–B.

the contest between individuals, groups, and the state over control of information, and as new assumptions replace what was previously taken for granted.

As the new informational culture or space that is being put in place through the use of electronic information technologies matures, law will interact with the new environment in a manner not all that different from the way it interacts with other spaces or cultures. It will attempt to regulate the technology while, at the same time, it accommodates itself to the technological culture. This accommodation will be reflected in new limits, values, and perspectives that are recognized implicitly or explicitly in new or changing standards and norms. As Steven Shiffrin has observed, "Law can play a role in shaping culture, but legal doctrine is a part of the culture and is frequently hostage to it."[21] To consider the meaning of the First Amendment in an electronic context, therefore, it is necessary to have a clear sense of the electronic culture or space in which it is becoming embedded. As electronic tools are increasingly used in lieu of print tools, and as an electronic culture displaces print culture, our interaction with this new space will be frustrating and ineffective if, as Hall's experience suggests, we fail to understand the qualities of the culture that has descended on the communications and legal environments.

Donald Norman has described the dual impact of a new medium of communication in the following terms:

> Technology is not neutral. Each technology has properties— affordances—that make it easier to do some activities, harder to do others: The easier ones get done, the harder ones neglected. Each has constraints, preconditions, and side effects that impose requirements and changes on the things with which it interacts, be they other technology, people, or human society at large. Finally, each technology poses a mind-set, a way of thinking about it and the activities to which it is relevant, a mind-set that soon pervades those touched by it, often unwittingly, often unwillingly. The more successful and widespread the technology, the greater its impact upon the thought patterns of those who use it, and consequently, the greater its impact upon all of society.[22]

This does not mean that environmental and cultural qualities or pressures will determine the outcome of pending First Amendment cases, but law and environment do tend to take each other into account. Holmes' assertion that "[t]he life of the law has not been logic: it has been experience"[23] may

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21. STEVEN H. SHIFFRIN, THE FIRST AMENDMENT, DEMOCRACY, AND ROMANCE 73 (1990).
22. DONALD A. NORMAN, THINGS THAT MAKE US SMART: DEFENDING HUMAN ATTRIBUTES IN THE AGE OF THE MACHINE 243 (1993).
23. OLIVER WENDELL HOLMES JR., THE COMMON LAW 1 (1881).

overstate the role of experience, but it should be clear that experience, in this case informational experience, is significant for the law. Without an understanding of the emerging culture as well as the emerging technologies, we run the risk that, in de Sola Pool's words, "[t]echnical laymen, such as judges, perceive the new technology in that early, clumsy form, which then becomes their image of its nature, possibilities, and use. This perception is an incubus on later understanding."[24]

In considering what is occurring as "print space" is redesigned into "electronic space," it is important to be sensitive to the manner in which change is occurring. A digital world should not be equated with a paperless world or one without print. Electronic technologies do not replace print as much as they displace it and bring about an erosion of various parts of print culture. As Michael Benedikt has observed, "just as printing did not *re*place but *dis*placed writing, and writing did not *re*place but *dis*placed storytelling, and just as movies did not *re*place theater nor television movies . . . cyberspace will not replace either objective reality or dreaming or thinking in their historical modes."[25] Similarly, David Bolter has commented:

> The printed book . . . seems destined to move to the margin of our literate culture. The issue is not whether print technology will completely disappear; books may long continue to be printed for certain kinds of texts and for luxury consumption. But the idea and the ideal of the book will change: print will no longer define the organization and presentation of knowledge, as it has for the past five centuries. This shift from print to the computer does not mean the end of literacy. What will be lost is not literacy itself, but the literacy of print, for electronic technology offers us a new kind of book and new ways to write and read.[26]

Words on paper will remain commonplace, but the principal manner in which we think about, describe, and use information will be based on very different electronic models of how information is organized, stored, and processed. Reading and writing, for example, will remain core skills, but interacting with machines will require reading and writing in a new context. Displacement is another way of recognizing that cultural pressures operate in a new technological environment and that how tools are employed and what they signify will change as many different boundaries of thought and behavior become vulnerable. The information environment of print is not disappearing, but it is becoming less controlling. We will not be paperless, but we may be impatient with paper because paper constrains and confines us in ways that are

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24. DE SOLA POOL, *supra* note 16, at 7.
25. Michael Benedikt, *Cyberspace: Some Proposals, in* CYBERSPACE: FIRST STEPS 119, 124 (Michael Benedikt ed., 1991).
26. BOLTER, WRITING SPACE, *supra* note 2, at 2.

no longer acceptable. Paper and print will continue to be present in our environment, but we will work more frequently with information in electronic, rather than print, form because tying information to a physical object, such as paper, radically diminishes what can be done with information. Most significantly, as our concerns and activities focus more on information in electronic form, we will begin to attribute to the electronic medium the attention and status reserved for the culture's primary medium.

The new media can be considered to be "displacing" because they not only make available some new tools for working with information but, in a sense, create a new space or make it seem as if we have been moved into a new space. Displacement seems an appropriate term for what is occurring because these changes put us in a different environment from where we were. The new media do not, of course, physically move us, but they can have as broad an effect on our orientation toward space and distance as other technologies, such as automobiles and planes, that physically change how we travel. They change the meaning of distance and cause us to interact with our surroundings differently. More particularly, the new media provide us with an environment where new relationships with people and groups are fostered, where people can "meet" in ways that were not possible before,[27] and where, as a result, new relationships begin to occur between people and institutions. The First Amendment is present in this new space but, as will be described below, a thicker and thicker overlay of experiences and concerns will begin to shape how we see this new space and what we expect of it.

This new environment emerges, in part, because the movement and use of electronic information are governed by quite a different set of rules and expectations than exist in the print environment. Just as the automobile created an environment in which rules and expectations for transportation were novel and unprecedented, the electronic media exist in a context or space where they do not have to play by the same rules as print and, therefore, rules and expectations for using information change. The new electronic space can be envisioned as an almost magical place, in the sense that various physical laws that restrict movement and limit capabilities appear to have been lifted. The theme of displacement, of being put in a new space, is useful, therefore, because it focuses on context rather than content. As a result, it can serve to shift attention to *how* we use and communicate information and away from *what* the information is. This focus will, I hope, assist in explaining both how the new media are different and why change in something so fundamental as a constitutional doctrine will occur as a result.

Printing, the medium of communication that has dominated Western culture for five centuries, itself provides a most relevant example of how law

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27. *See* Lindsy Van Gelder, *The Strange Case of the Electronic Lover*, *in* COMPUTERIZATION AND CONTROVERSY: VALUE CONFLICTS AND SOCIAL CHOICES 364 (Charles Dunlop & Rob Kling eds., 1991).

and technology interact. The invention and spread of printing did not guarantee the development of a constitutional protection of free press, of copyright protections, or of legal concerns with privacy, but there are strong associations between the changed informational environment that emerged in the fifteenth, sixteenth, and seventeenth centuries and these areas of law.[28] Certainly, the development of printing changed the culture of information and communication. Printing was the first mass medium and the first medium that guaranteed that a standardized and uniform message could be distributed widely. Such a change from the highly controlled, nonstandardized, and relatively inaccessible medium of writing[29] fostered a new concept of authoritative information, contributed to a new role for authors, and fostered a new relationship between the individual and the state.[30] It led to a whole set of new experiences with information and to a more active communications environment, one in which there were both acts of censorship and reactions to acts of censorship.[31] Many of the laws, doctrines, and concepts we are familiar with but that were quite novel in the eighteenth century were responses to a changing orientation caused by the fact that "what was shared, and what belonged to others were no longer as clear as they once had been" in the period prior to Gutenberg.

Professor Alvin Kernan has argued that the effects of printing included a "print logic" that permeated the culture, and not simply an increased number both of books produced and of uniform and authoritative copies.[32] This was a major theme of Marshall McLuhan, who claimed that the world, as seen through the eyes of a print-oriented person, was "connected (abstract figures with fixed boundaries, linked logically and sequentially but having no visible grounds), homogeneous (uniform everywhere), and static (qualitatively unchangeable)."[33] For example, the process of reading silently, which replaced reading aloud, "began to shape mental structures, imparting a sense of the world as a set of abstract ideas rather than immediate facts, a fixed point of view organizing all subject matter into an equivalent of perspective in painting, and the visual homogenization of experience."[34]

28. KATSH, ELECTRONIC MEDIA, supra note 6, at 136–48.

29. M.T. CLANCHY, FROM MEMORY TO WRITTEN RECORD: ENGLAND, 1066–1307, at 175–201 (1979)

30. See generally MARK ROSE, AUTHORS AND OWNERS: THE INVENTION OF COPYRIGHT (1993).

31. LEONA ROSTENBERG, THE MINORITY PRESS AND THE ENGLISH CROWN 4 (1971), see also ROBERT DARNTON, THE LITERARY UNDERGROUND OF THE OLD REGIME at v–vi (1982); LUCIEN FEBVRE & HENRI-JEAN MARTIN, THE COMING OF THE BOOK 143–66 (Geoffrey Nowell-Smith & David Wooton eds. & David Gerard trans., 1976); DAVID T. POTTINGER, THE FRENCH BOOK TRADE IN THE ANCIEN REGIME, 1500–1791, at 54–81 (1958); FREDERICK SEATON SIEBERT, FREEDOM OF THE PRESS IN ENGLAND 1476–1776 (1952); S.H. STEINBERG, FIVE HUNDRED YEARS OF PRINTING 264 (3d ed. 1974); Raymond Birn, Book Production and Censorship in France, 1700–1715, in BOOKS AND SOCIETY IN HISTORY 156 (Kenneth Carpenter ed., 1983).

32. ALVIN KERNAN, PRINTING TECHNOLOGY, LETTERS AND SAMUEL JOHNSON 51 (1987).

33. MARSHALL MCLUHAN & BRUCE R. POWERS, THE GLOBAL VILLAGE: TRANSFORMATIONS IN WORLD LIFE AND MEDIA IN THE 21ST CENTURY 45 (1989).

34. KERNAN, supra note 32, at 51.

As technological change involving the communication, processing, and storing of information occurs today at an extraordinarily rapid rate, an exploration of the culture of cyberspace may suggest as much about the future role of the First Amendment as an analysis of cases and doctrine. At the very least, experiences in cyberspace, and the expectations and values fostered by this new environment, should be examined along with judicial assessments of the relevance of past decisions and experiences. We may have some doubts about the new stage on which the drama of the First Amendment will be set, but some components of the emerging electronic culture are becoming quite clear; even now, we are beginning to feel pressure to confront some basic expectations and assumptions about constitutional guarantees involving communication and information. It is clear that "[o]ur paradigm of information *has been* the book,"[35] but it is not clear how much longer print will serve as the information paradigm.

The following Part describes four core components of the electronic information environment. As these capabilities are developed and employed, electronic space is becoming more clearly differentiated from print space. They are the catalysts for the changes that are occurring in how we use information, and are the building blocks of an informational culture and a First Amendment framework oriented more around electronic space and electronic logic than around print space and print logic.

II. THE NEW TECHNOLOGICAL ENVIRONMENT

The new technological environment consists largely of four components—computer networks, interactive machines, word and image, and hypertext—that either did not exist or were quite different in the print environment.

A. *Computer Networks: Mechanisms for Electronic Distribution and Publication*

In 1987, scientist Peter Denning wrote that:

> Computer networks that nurture networks of people are the culmination of a process of evolution which can be said to have five stages: (1) file transfer, (2) remote connections, (3) distributed computation, (4) real-time collaboration, and (5) coherent function. At the first stage, a network is able to transfer files of information among computers, but without guaranteeing delivery time; this stage is

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35. Robert Berring, *Power and Paradigm*, in HIGHLIGHTS: A SELECTION OF PRESENTATIONS (1991–1993) FROM THE CONFERENCE ON TEACHING RESEARCH IN PRIVATE LAW LIBRARIES 73 (1993) (emphasis added).

sufficient to support electronic mail, bulletin boards, news services and jointly authored papers. At the second stage, the network enables a user to connect to remote resources, such as instruments, computers, or databases, and employ them in real time as if they were local. At the third stage, the network is able to support distributed computations that include computing processes and resources at widely separated nodes; an example is a user interface process on a workstation, connected to a numerical process on a supercomputer, connected in turn to a graphics display system. At the fourth stage, the network directly supports collaboration by permitting real-time conferences of users at different workstations, who can communicate as if they were gathered around one workstation—that is they can tap into a "common universe" in which they can talk, point to and share objects, edit and run programs, and examine outputs. At the fifth stage, the network is a coherent system comprising people and the resources contributed by them; each person can look in at this world from his workstation. The network will provide services to help people locate, use, and contribute resources, and to translate between the terminologies of the disciplines.[36]

We are, at present, still some distance away from an easy-to-use, flexible, widely accessible, and broadly used network of electronic communication. Most of Denning's stages have been realized, but only for the relative few. The online world is rapidly becoming a more habitable place, but it still is not as hospitable as it ultimately will be. Network-based electronic information may one day be as efficiently used and as accessible as an automatic teller machine, which represents an everyday example of a hospitable and accessible link to a high-speed communications network. Nevertheless, there are both hardware and software barriers to overcome before that occurs.

The international set of networks known as the Internet[37] has experienced extraordinarily rapid growth in spite of many technical obstacles. For example, the number of networks linked to the Internet increased from 217 in July 1988 to 14,121 in July 1993. Between July 1993 and January 1995, as the Internet received more publicity, as software improved, and as commercial possibilities became clearer, the number of networks nearly tripled to 46,318.[38] The number of host computers linked to the Internet increased from 28,174 in December 1987 to 1,136,000 in October 1992 to 3,864,000 in October 1994 and to 4,852,000 in January 1995.[39] The number of World Wide Web servers

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36. Peter Denning, *A New Paradigm for Science*, 75 AM. SCIENTIST 572, 573 (1987).

37. The Internet is not, as is often reported, a single network. It is a collection of networks bound together by the use of a common communications protocol.

38. These data are available online at URL <gopher://nic.merit.edu:7043/11/statistics/nsfnet/history/netcount>.

39. These data are available online at URL <gopher://nic.merit.edu:7043/11/statistics/nsfnet/history/hosts>.

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increased from about 500 in Fall 1993 to almost 10,000 in Fall 1994.[40] It is estimated, as of the beginning of 1995, that between 30 and 40 million people have Internet access of some kind, either through universities, businesses, or commercial services such as CompuServe or America Online.[41]

Computer networks change the distribution of information from a process dependent upon modes of transportation to one in which information moves at electronic speed. The limits of planes and trains are overcome, and national or territorial boundaries that can interfere with communication become less significant, as does distance in general. Those with high-speed network connections may see considerable validity in Michael Benedikt's comment that it is possible to "wander the earth and never leave home."[42]

Electronic networks change how much time is needed to move and access information but it is their impact on the dimension of distance, even more than on the time dimension, that may bring about the most profound change. Computer networks allow much information that was previously inaccessible and valueless because it was in a distant place, to become useful and valuable when it is accessible via a network. Similarly, people with whom one could only maintain a "distant" relationship can now become co-workers who can efficiently interact with each other. As information that was previously isolated and separate is shared and used as if it were in one place, and as people who were once separated communicate more often, new relationships and new institutions are formed.

We are an increasingly networked society because any computer not connected to a network and not able to benefit from interaction with other machines is a deeply limited machine. Any individual without a networked machine is an isolated individual and less able to add value to information and to work with others. Networks cannot satisfy all of the needs that are met by

40. Peter H. Lewis, *Companies Rush To Set Up Shop in Cyberspace*, N.Y. TIMES, Nov. 2, 1994, at D1.

41. Philip Elmer-DeWitt, *Welcome to Cyberspace*, TIME, Spring 1995 (Special Issue), at 9.

42. Benedikt, *Introduction* to CYBERSPACE: FIRST STEPS, *supra* note 25, at 1, 14. One computer executive has argued that "[t]he information age will not be here until you can access the Library of Congress from your desk." *The National High-Performance Computer Technology Act of 1989: Hearings on S. 1067 Before the Subcomm. on Science, Technology, and Space of the Senate Comm. on Commerce, Science, and Transportation*, 101st Cong., 1st Sess. 42 (1989) (testimony of Sheryl Handler). The Library of Congress is, indeed, already making some parts of its collection available electronically. *See Library of Congress World Wide Web Home Page*, *available online at* URL <http://marvel.loc.gov/>. In cooperation with the House of Representatives, the Library of Congress is also providing access to pending legislation through "Thomas," a World Wide Web site named in honor of Thomas Jefferson. *See THOMAS: Legislative Information on the Internet*, *available online at* URL <http://thomas.loc.gov/>. This provides distant persons with a resource that even the physical Library of Congress could not provide. We are moving in the direction of having a source of information, available from one's desk, that is far more diffuse, scattered, and potentially even larger than what exists in the Library of Congress. In a print world, it matters that the Library of Congress is in one place and that other sources of information, however useful they might be, are in many different places. In an electronic world, the physical location of information is an obstacle that can be overcome and, indeed, the miracle for the user is that dispersed information, when it appears on screen, seems to be in one place. If one thinks of cyberspace as a place, of course, the information is in fact in one place.

face-to-face communication, but they do satisfy many of them. E-mail, for most people, is not yet as convenient as using the telephone or walking down the hall to consult a colleague, but it is approaching this level of convenience for increasing numbers of people. As this occurs, it changes the kinds of relationships and associations that one can have with persons located at a distance. In addition, as transmission speeds of electronic communication increase, using data on a distant computer becomes easier and, at some point, is virtually no different from using data on one's own computer.[43]

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43. The speed with which information moves, the shattering of distance barriers, and the difficulty in ascertaining where any information is at any point in time, underlies the virtual irrelevance of the prior restraint doctrine. Lucas Powe has rightly noted that we are in an age that has "moved the 'no prior restraints' doctrine into functional obsolescence." LUCAS A. POWE, JR., THE FOURTH ESTATE AND THE CONSTITUTION 141 (1991). Prior restraint can be considered a creature of print logic or print logistics since printing requires a physical place, the publisher is generally within the jurisdiction in which the books are sold, and the publication process is not instantaneous. Challenges to electronic information are inevitably more frustrating than challenges to print media because alleged offenders of some norm or standard may be located anywhere. With information traveling at electronic speed over computer networks, we are often under the illusion that information is in one place when it may actually may be in multiple places. Information that is viewed by citizens sitting in their homes or offices and that appears to be on the computer they are connected to may be located outside the territorial borders of their country. The following is not a prior restraint dispute but does illustrate the difficulty facing any institution wishing to control access to information.

On April 7, 1994, a letter to the Wake Forest student newspaper, the *Old Gold and Black*, contained the following:

We write to inform President Thomas K. Hearn Jr. of a disturbing development on campus that has recently been brought to our attention.

While operating a computer in an undergraduate computer lab, one of us happened upon the "Queer Resource Directory," an electronic network that operates on the university's Deacons On-Line program and promotes homosexuality and other perverted sexual practices.

One prominent entry in the directory offers students the following: "Radical, graphically illustrated dialogue on gay male sexuality, including—but not limited to—oral sex, anal sex, S&M, B&D, cross-dressing, masturbation, phone sex, home-video porn, nipple stimulation, smooching and fondling, slow dancing and the finer points of eroticized, condom-equipped 'safer sex'."

We are shocked to see such a thing on the university computer system. We think you will agree with us that this is not in keeping with the principles upon which the university was found[ed], nor does it promote a healthy academic community.

As Christians, we find the "Queer Resource Directory" deeply offensive. It offends ou[r] morals, our sense of right and wrong, and our deep-seated religious convictions. . .

If for no other reason, the "Queer Resource Directory" should be stricken from the Deacons On-Line application, for the simple reason that it interferes with and infringes upon a natural, God-given right of ours: our right to pursue happiness.

The thought that our tuition money is being used to support a lifestyle which we find morally repugnant pains us beyond belief and serves as a stumbling block in our pursuit of happiness.

Quoted in E-mail from Mikki Barry to author (Apr. 12, 1994) (1st of 2, on file with author)
A response to the newspaper a few days later:

We write in response to a letter published in this paper on April 7, 1994 regarding the Queer Resource Directory (QRD) and the university's Deacons On-Line system. This letter was riddled with factual errors, and we would like to take a moment to point out these errors to your readers.

First and foremost, the QRD does not "operate on" the Deacons On-Line system which is present at Wake Forest. In fact, it is headquartered on a privately owned and operated computer more than 300 miles from Wake Forest. It is available to anyone who has access to the world-wide Internet and is one of the most widely used resources of its kind, recording more than 100,000 accesses per month—including a few hundred from Wake Forest University. Contrary to the claims of the [letter], no university resources of any kind are used to support

B. *Interactive Communication*

Mass media are largely one-way media, distributing copies of the same message to many recipients. Print was the first mass medium since it was the first medium able to circulate identical copies of a work. Computerized communication, particularly networked communication, is commonly two-way communication. Using a computer and even reading off of a screen is different from reading a page of print in that the user of electronic material is engaged in a continuing process of sending messages to and receiving messages from a local or distant computer. Pressing keys is not the same as turning pages since pressing keys involves a two-way interaction that has no parallel for the reader of a book. The computer user may or may not be aware of all of the information that is being sent back to the source machine every time some action is taken. Unlike reading, however, which may change the reader but not the reading material, the interaction with the computer initiates a two-way stream of information.

The interactive and dynamic quality of working with electronic information is what makes "automation" an inadequate label for describing what occurs in' electronic information processes. Automation, a process in which a machine replaces human labor, suggests a closed or one-way communications model. In contrast, bringing information technology into an environment tends to be revealing and to open up the system. Information technologies, if it is possible to generalize about them, are typically not a good means to compartmentalize operations or to exercise rigid control because the technology that regulates the flow of information is, at the same time, stimulating the creation of information. Someone will want that information. Much of this information will escape, either by design or by accident, because it is in a form that is easily used, easily copied, easily analyzed, easily manipulated, easily combined with other data, and easily sent to any machine linked to the network.

Shoshana Zuboff, a professor at the Harvard Business School, has suggested that we need to create a new word for what occurs with the electronic media. Instead of "automate," Zuboff argues that we employ the word "informate," a term that has a more active meaning and suggests new information is generated at the same time that some process is being regulated.[44] This "informating" quality of the new media accounts for the growth of information-related activities, activities that attempt to process and otherwise add value to information. For example, automated teller machines (ATMs) do much more than replace bank tellers with machines; they provide both users and banks with more information. Not only do automated tellers

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the QRD.

Quoted in E-mail from Mikki Barry to author (Apr. 12, 1994) (2d of 2, on file with author).

44. SHOSHANA ZUBOFF, IN THE AGE OF THE SMART MACHINE 10 (1988).

enable transactions to be processed at a lower cost, they also enhance a bank's information processing activities.[45] As the ATM model is extended and bank accounts are connected to home computers, many different kinds of informational activities will be stimulated—activities that move both parties even further away from the discrete face-to-face encounter.

The redefinition of "information" from a thing to a process is symptomatic of a more general shift in the nature of our information-oriented activities. As the network links machines together, the number of machines with which we can interact increases. We obtain more information than previously, but we also reveal more about ourselves in the process. Information acquisition becomes more accurately described as an information transaction, and the price of acquiring information is often the disclosure of some kind of personal information.

Some of the most frequently asked initial questions about using electronic media concern whether humans can be replaced by machines. This is the "automating" paradigm at work, as lawyers and citizens inquire whether machines can replace judges[46] or whether machines will replace lawyers. As traditional informational activities become electronic in nature, some tasks performed by humans will indeed be performed by machines, by "expert systems,"[47] and by processors endowed with artificial intelligence. These tasks, however, should be viewed in the larger "informating" context, as being part of a process in which individuals are continuously creating information as they interact with the new media. The digital age professional is not an automated machine but a person who is sensitive to this process of interacting with machines, who understands how to add value to digital information,[48]

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45. *See generally* WALTER B. WRISTON, THE TWILIGHT OF SOVEREIGNTY (1992) (discussing changes wrought by information technology).

46. Anthony D'Amato, *Can/Should Computers Replace Judges?*, 11 GA. L. REV 1277 (1977).

47. RICHARD SUSSKIND, EXPERT SYSTEMS IN LAW 3 (1987).

48. As more and more economic activities involve information rather than goods, one particular First Amendment distinction will come under increased scrutiny. The focus of "commercial speech" has typically been speech about a product. Note, *Message in Medium, supra* note 7, at 1085 ("Commercial speech is expression about goods and services, as distinct from the actual transactions."). In an economy in which the core activity is informational, however, commercial speech will not be speech *about* a product but will *be* the product. In such an economy, the marketplace of ideas will be an economic marketplace. Collins and Skover have argued that:

> In our culture of advanced capitalism, there is a striking redundancy in the notion of "commercial speech." . . . To overlook the relationship between commerce and communication is to place the First Amendment in a false light. To comprehend more fully the phenomenon of commercial speech, we must look beyond First Amendment cases and commentary to the *actual* ways in which our culture communicates about and through commodities.

Collins & Skover, *Commerce and Communication, supra* note 6, at 698–99. As I noted earlier, *supra* note 6, Collins and Skover focus on television and on how advertising pollutes discourse. I agree with them that informational activities are economic activities and that the culture of informational activities is of critical importance in assessing its impact, but my concern is not with the mass media but with the fact that work increasingly is work with information rather than work with tangible goods. The recipient of information often receives a product that has value in itself and that also can have value added to it. Collins and Skover argue that commercial advertising infects all speech, although they stop short of advocating that the First Amendment should not protect commercial speech. As economic activities increasingly become

and whose professional competence is expanded through information production as well as information management.[49]

C. *Word and Image*

In two recent works, Edward Tufte has impressively demonstrated how the development of printing changed the relationship that had earlier existed between text and image.[50] Although printing presses could, of course, handle pictures, and books of art were often published, the bias of printing was more toward text than image. The link between word and image that had been nurtured through earlier centuries gradually eroded as the new technology became more focused on words and less on images. As one scholar concluded:

> The illustrated book, the book in which the text is accompanied by paintings depicting a scene described in the text, is a medieval conception. The Renaissance did not adopt it and adapt it; it rejected it. The history of the illustrated book in the fifteenth and sixteenth centuries is an account of its losing struggle for survival. By 1550 the illustrated book is dead.[51]

There are, of course, many printed books with both text and pictures, and there are large numbers of very beautiful books devoted solely to art. Printing images, particularly colorful images, was and is both a more expensive process and a more complicated process, however, than printing text. Printing undoubtedly helped to popularize some artists and to make available reproductions of paintings. Nevertheless, the teams of scribes and artists that previously produced manuscripts together gradually dissolved. While both authors and artists independently benefited from the distribution of many copies of their work, "[r]elationships between text and illustration, verbal description and image were subject to complete transpositions and disruptions."[52]

Textual communication thrived in the environment of print. This was one reason why word-oriented institutions, such as the law, flourished.[53] Images received less support, however, from the medium of print. Some individuals who worked with images, such as prominent artists, benefited considerably

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informational activities, we may find that according second-class status to commercial speech and distinguishing commercial speech from other kinds of speech will be as frustrating as imposing a prior restraint on information moving around a network at electronic speed.

49. M. Ethan Katsh, *Digital Lawyers: Orienting the Legal Profession to Cyberspace*, 55 U. PITT. L. REV. 1141 (1994).

50. TUFTE, ENVISIONING INFORMATION, *supra* note 9; TUFTE, VISUAL DISPLAY, *supra* note 9.

51. E.P. GOLDSCHMIDT, THE PRINTED BOOK OF THE RENAISSANCE 27 (1950).

52. EISENSTEIN, *supra* note 9, at 258.

53. *See generally* KATSH, ELECTRONIC MEDIA, *supra* note 6, at 80–88 (discussing role of printed word in modern law's eclipse of oral tradition).

from print as copies of their works were widely distributed in books, but most printed books had no images. What was least supported in the print environment was the word-image relationship.[54] Words and images went their separate ways, with words being a concern of almost everyone and images being the province of artists, designers, and other specialists.[55]

Computers were originally even more textually oriented than print.[56] As machines have become more powerful and as network transmission speeds have increased, however, graphical capabilities for communication and expression have expanded as well. Television has provided us with an opportunity to *view* more visual material, but it has not allowed us to *work* with such material. The new media provide us with extensive interactive graphical tools. Such tools change the costs and reduce the difficulty of creating and communicating through images, icons, charts, figures, graphs, scales, tables, diagrams, maps, sketches, blueprints, colorful and animated graphics, and other visual forms. For individuals, groups, and institutions, they open up new visual choices for persuasion, description, representation, characterization, and other goals of the communicative process.

One computer scientist has observed that it is "hard to have graphical dreams in a textual world."[57] The new technologies encourage the interaction with information using new graphical tools that facilitate both acquisition and expression. Print itself opened up new visions by popularizing more realistic artistic representations through the use of linear perspective and the use of geometry to create the illusion of depth and perspective.[58] The dynamic

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54. When Galileo, in 1613, wrote about observing the moons of Saturn, he placed a sketch of the planet and its moons between words, in the middle of a sentence, assuming that it was only natural to provide an image at that point. The image he placed between words was not something separate, an illustration or figure supporting the words, but was, like the words surrounding the image, simply part of the paragraph. In Edward Tufte's words, "The stunning images, never seen before, were just another sentence element." TUFTE, ENVISIONING INFORMATION, *supra* note 9, at 121.

55. The impact of print on visual communication is discussed more fully in KATSH, LAW IN A DIGITAL WORLD, *supra* note 7, at 133–171.

56. The original IBM PC operated only in "character mode" with letters appearing in one size and shape on a screen with 80 columns and 24 rows. A separate graphics card had to be purchased in order to display images. One of the principal contributions of the Apple Macintosh and later of Microsoft's Windows software was to allow text and image to coexist on the screen in harmony.

57. Marshall Brain, *Stop Bit*, BYTE, Apr. 1992, at 368, 368.

58. Samuel Edgerton has written:

> It should not be overlooked that almost coincidental with the appearance and acceptance of linear perspective came Gutenberg's invention of movable type. Together these two ideas, the one visual, the other literary, provided perhaps the most outstanding scientific achievement of the fifteenth century: the revolution in mass communication. Linear perspective pictures, by virtue of the power of the printing press, came to cover a wider range of subjects and to reach a larger audience than any other representational medium or convention in the entire history of art. It is fair to say that without this conjunction of perspective and printing in the Renaissance, the whole subsequent development of modern science and technology would have been unthinkable.
>
> Hence the real contribution of linear perspective seems to have been more to the advancement of science than to the history of art. If perspective often seems inimical to the impatient and introverted aesthetic sensibility of artists today, it certainly appealed to the more extroverted, acquisitive attitudes of the Renaissance. In the early Quattrocento, it was the

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quality of the electronic media allows for animated and multi-dimensional
models, for novel opportunities to view and understand complexity, and for
behavioral and informational patterns and relationships to be seen in new
ways.[59]

D. *Hypertext*

Information in books has an inherently linear mode of organization. Books
have a beginning and an end and a preferred arrangement designed by the
author. The role of the author is not merely to compose content but to present
a structure and "line" of argument. The table of contents is the device that
summarizes the nature of the route suggested by the author. Hypertext or

professed goal of artists to know as much about their physical surroundings as possible in order
to lend conviction to their moral message. As linear perspective fixed their eyes more intensely
on the natural world, these humanist craftsmen became quasi scientists. And as their perspective
pictures proliferated, especially through the medium of printed books, more and more people
from all walks of life began to be aware of the underlying mathematical harmonies of nature
which perspective articulates.

So far as science is concerned, can there be any question that the special geniuses of
Leonardo da Vinci, Columbus, and Copernicus were given a very special catalysis at this time
by the new communications revolution of linear perspective? Indeed, without linear perspective,
would Western man have been able to visualize and then construct the complex machinery
which has so effectively moved him out of the Newtonian paradigm into the new era of
Einsteinian outer space—and outer time? Space capsules built for zero gravity, astronomical
equipment for demarcating so-called black holes, atom smashers which prove the existence of
anti-matter—these are the end products of the discovered vanishing point.

Or, are they? Surely in some future century, when artists are among those journeying
throughout the universe, they will be encountering and endeavoring to depict experiences
impossible to understand, let alone render, by the application of a suddenly obsolete linear
perspective. It, too, will become "naive," as they discover new dimensions of visual perception
in the eternal, never ultimate, quest to show truth through the art of making pictures.

SAMUEL Y. EDGERTON, JR., THE RENAISSANCE REDISCOVERY OF LINEAR PERSPECTIVE 164–65 (1975)
(footnotes omitted).

59. As information is stored in bytes rather than fixed on paper, control by nearly all those who
previously exercised control is diminished. For the state, sovereignty is undermined when governmental
attempts to control the flow of information are increasingly evaded as targeted information is moved to
machines located beyond territorial borders. For authors, as the discussion of hypertext will reveal, control
over one's own work is diminished as users/readers have opportunities to restructure the work. Visual
communication expands our capabilities for expression and for seeing facts and relationships in new ways.
But what is graphic can also become pornographic. Walter Kendrick has observed:

If the smut of fifty or even twenty years ago looks tame by comparison with today's, the reason
may have nothing to do with pornography itself. Every mode of representation has become
explicit in the same years, in every nonsexual realm; it has become possible to photograph the
earth from outer space, a fetus in the womb, and Vietnamese children in the process of dying.
The only difference in the case of pornography is that it faces steady resistance, while these
other advances in explicitness win praise for contributing to the enrichment of knowledge.

WALTER KENDRICK, THE SECRET MUSEUM: PORNOGRAPHY IN MODERN CULTURE 221 (1987).

The First Amendment is challenged not simply by an explosion of tasteless images, however, but by
what electronic communication suggests more generally: that boundary lines between different forms of
expression have become blurred. In the area of the pornographic, the line between what is accepted and
what is unaccepted, between what the state has had authority to bar, such as the obscene, and what it
tolerates, may become equally difficult to find and enforce. If the boundary between the pornographic and
the obscene, which was never an easy boundary to find, becomes even more ambiguous, there may be some
highly publicized prosecutions but also a realization that the categorization of a certain class of images as
obscene reflects a form of print logic that may be frustrated in an electronic environment.

hypermedia is information on screen, text or image, that is arranged so as to allow the user or reader to move through it or beyond it in a variety of ways.[60] It provides new tools for users to navigate through information and to use a body of information in ways that were not possible or were extremely cumbersome with print. Hypertext itself is a term coined by Theodor Nelson who defined it as "non-sequential writing—text that branches and allows choices to the reader, best read at an interactive screen. As popularly conceived, this is a series of chunks connected by links which offer the reader different pathways."[61]

Hypertext allows information to be linked to other information in a work or to information on a network in a much more flexible manner than is possible with "bound" material. Hypertext catalyzes communication by allowing users to escape the constraints of the binding. Links can be established between many different parts of a single text or between parts of different works that exist in different places. In general, it "allows units of text to be linked in a manner which enables users to move quickly between associated ideas."[62]

Hypertext is an extension of the interactive capabilities of the electronic media. Interaction implies that responses or other actions by a user lead to further opportunities for the user to select from more choices than are typically available with print. In reading the essays in this Symposium, for example, you have probably tended to turn pages sequentially, moving from beginning to end or at least from the beginning to the end of one essay. If you were using a hypertextual version of the information in this issue or a hypertextual version of electronic information located in different places, your route to this point and your exit point from here might have been different.[63] At many stages along the way, you would be presented with choices. Instead of thinking about what comes next or about what is on the next page, you would begin thinking

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60. See GEORGE LANDOW, HYPERTEXT 4 (1992); THEODOR H. NELSON, LITERARY MACHINES 2 (1981); see also BOLTER, WRITING SPACE, supra note 2, at 24 ("[T]he connections of a hypertext are organized into paths that make operational sense to author and reader. . . . In print, only a few paths can be suggested or followed. In an electronic version the texture of the text becomes thicker, and its paths can serve many functions."); TEXT, CONTEXT, AND HYPERTEXT: WRITING WITH AND FOR THE COMPUTER (Edward Barrett ed., 1988); THE SOCIETY OF TEXT: HYPERTEXT, HYPERMEDIA, AND THE SOCIAL CONSTRUCTION OF INFORMATION (Edward Barrett ed., 1989); I. Trotter Hardy, Project CLEAR's Paper Choice: A Hypertext System for Giving Advice About Legal Research, 82 LAW LIBR. J. 209, 211 (1990) ("The advantage of this [hypertext] information structure over others is both the speed of access and the fact that users can display and read only those topics they want, without having to bother with other topics."); David R. Johnson, Building and Using Hypertext Systems, 17 LAW PRAC. MGMT., May–June 1991, at 28; Pamela Samuelson & Robert J. Glushko, Intellectual Property Rights for Digital Library and Hypertext Publishing Systems, 6 HARV. J.L. & TECH. 237 (1993) (discussing intellectual property schemes that would make hypertext publishing commercially viable); Ronald W. Staudt, Legal Mindstorms: Lawyers, Computers and Powerful Ideas, 31 JURIMETRICS J. 171, 181–85 (1991) (discussing possible roles for hypertext in legal education).

61. See NELSON, supra note 60, at 2.

62. V. MITAL & L. JOHNSON, ADVANCED INFORMATION SYSTEMS FOR LAWYERS 143 (1992).

63. See ED KROL, THE WHOLE INTERNET 227–42 (1992) (discussing use of hypertext on Internet).

about where you would like to go next. Instead of glancing at a reference in a footnote, you could read the material in the footnote and even move beyond that to other sources.

Books exist in a discrete space and are designed to be read in a linear manner. There are page numbers, tables of contents, and most important, indexes, which do provide the reader with some ability to locate information of interest. Hypertext, particularly in a networked environment, goes far beyond this, however, by allowing the user not simply to rearrange the order in which something is read but to create an individualized work that contains information from sources that are physically distant from each other.[64]

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64. If the First Amendment is not simply a set of rules but a framework for understanding the role of information in society, hypertext may, over time, be the technological innovation that presents the most interesting challenge to First Amendment doctrine and theory. Networks provide obvious challenges to authority by negating territorial boundaries but the boundaries that are made vulnerable by hypertext are more subtle. When a work is no longer physically discrete, it may no longer be clear what the work is or whether there is a single work. First Amendment theory places a high value on self-realization and the advancement of knowledge and a hypertext environment certainly fosters these goals. Yet, hypertext raises highly perplexing questions about the boundary between the First Amendment and copyright, between fostering the flow of information and granting ownership rights over information and control over its use. KATSH, LAW IN A DIGITAL WORLD, *supra* note 7, at 215–27; *see also* Samuelson & Glushko, *supra* note 60, at 237 (discussing efficacy of copyright in encouraging production of hypertext). The existence of a discrete boundary between copyright and the First Amendment is supported by print logic but is challenged by electronic logic. Electronic logic is comfortable with finding and promoting relationships in situations where previously they were obscured or difficult to establish. The mass-produced book that emerged with print had links to other works in the form of footnotes on many of its pages but, at best, these links were located in smaller print and at the bottom of the page or the back of the book. The reference was physically distant from the source. What was prominent was the author, who appeared on the title page and who controlled the presentation of information. With hypertext, however, the reference *is* the source and the work becomes situated in a web of related works. Electronic logic displaces the author, not removing him or her from receiving credit but, much more often than in the past, putting the author or creator in a larger context, seeing the author's work as having a relationship with and connection to the works of others, and using hypertext to operationalize these new relationships.

The hypertext environment's diminished support for independent activities poses challenges to First Amendment doctrines that assume that autonomous activity was part of the landscape of the informational environment. The autonomy of the editor or publisher was supported by print, by the ownership of production facilities, and by the discrete product that was distributed. Authoring was clearly a separate activity from publishing. The hypertext environment does not eliminate newspapers or authors, but it does communicate a clear message to traditional publishers that even if the rules of the game do not change, new strategies for successful competition are required.

In a transitional environment, where traditional news organizations retain considerable influence and power, arguments for *Tornillo*-type rights of reply will probably seem either as cogent or as unpersuasive as they appeared when *Tornillo* was decided more than 20 years ago. *See* Miami Herald Publishing Co. v. Tornillo, 418 U.S. 241 (1974). A common response to those still advocating rights of reply is that there are more avenues for communication than there were 20 years ago. The autonomy of the editorial process can be maintained, because the ability of the individual to distribute or publish information has been enhanced. There is considerable truth to this, but what is not being recognized is that the hypertext environment is a linked environment in which economic success is predicated on the formation of links, associations, and relationships, and in which distribution may occur using a shared network. Editorial autonomy may or may not be protected by law for some time, but how we value journalistic autonomy may change nonetheless as hybrid forms of organization make the node on the network more common than the independent print publisher.

III. THE FIRST AMENDMENT, PRINT CULTURE, AND THE ELECTRONIC ENVIRONMENT

In her classic work, *The Printing Press as an Agent of Change*,[65] Elizabeth L. Eisenstein examined the nature of the shift from a scribal culture to a print culture. The most obvious immediate impact was on the number of books produced. Printing's core technological capability was to produce many identical copies of a work, thus stimulating what today would be described as an "information explosion." One writer has suggested that "[a] man born in 1453, the year of the fall of Constantinople, could look back from his fiftieth year on a lifetime in which about 8 million books had been printed, more perhaps than all the scribes of Europe had produced since Constantine founded his city in A.D. 330."[66] Other estimates calculate that 15 to 20 million books were printed before 1500 and that 150 to 200 million copies were printed in the sixteenth century.[67] Hirsch estimates that 40,000 titles or approximately 10 million books were published in the fifteenth century and that by the middle of the sixteenth century, 150,000 titles had been published in more than 60 million copies.[68]

The impact of printing on Western culture, however, went far beyond the accelerated production of physical artifacts. Printing was the first technology that could produce uniform copies of a work and this "produced fundamental alterations in prevailing patterns of continuity and change."[69] The emergence of printing as society's principal medium of communication involved a changing view on where authoritative and reliable information was located. In the manuscript era, it was impossible to be certain what an author had written because "every copy was unique, with its own variations."[70] In "scribal culture," the oldest version of a document had been considered to be the most perfect since it represented the edition of the work that had been copied the least. After printing, however, the most recent version was considered the most valuable. As a result, print encouraged the production not only of new editions but of a new relationship with information, one that stimulated the production of scholarly and creative works that relied on recent publications.

The authority of print gradually permeated the law. Collins and Skover have noted:

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65. EISENSTEIN, *supra* note 9.
66. Michael Clapham, *Printing*, *in* 3 A HISTORY OF TECHNOLOGY: FROM THE RENAISSANCE TO THE INDUSTRIAL REVOLUTION 377, 377 (Charles Singer et al. eds., 1957).
67. FEBVRE & MARTIN, *supra* note 31, at 262.
68. RUDOLPH HIRSCH, *Printing and the Spread of Humanism in Germany: The Example of Albrecht von Eyb*, *in* THE PRINTED WORD 24, 25 (1978).
69. EISENSTEIN, *supra* note 9, at 703.
70. DE SOLA POOL, *supra* note 16, at 213.

> Approximately a century after the invention of moveable type,
> Western legal tradition began to be characterized by print. Today, our
> legal consciousness is still demarcated and mediated by printed texts.
> Whether, for example, in the formation and interpretation of wills or
> contracts, or in the review of court trials and legislative proceedings,
> the law's primary instrument remains the printed document. Wherever
> we turn, legal reality is shaped largely by the printed word.[71]

In those situations in which the spoken word had been relied upon and
preferred to the written, such as when oral testimony contradicted written
"proof,"[72] print culture suggested that faith and trust should be placed in
words on paper. In a somewhat similar fashion, changes in conceiving of and
using precedent accompanied changes in where authoritative information could
be found and used.[73] Print inevitably fostered more conflicts with the state
than did writing, conflicts in which there was both suppression of much
information and many successful attempts to avoid suppression.[74]

Print fixed information on paper in a way that allowed books to exist in
space and survive over time. Books are physical entities and the constraints of
using information that consists of words fixed on paper and pages that are
bound into volumes have framed much of our use of information for several
centuries. Libraries, for example, are needed as places for holding books, and
they are designed and organized so as to facilitate access to information in
print form. Card catalogues are necessary because books occupy a great deal
of physical space and each book needs to be represented by something smaller
so that there is information about the whole collection in one place. In law, the
whole West key number and digest system was a highly creative, albeit labor-
intensive, method for dealing with the constraints of information in physical
form.

Electronic information is fixed neither in time nor in space. Information
that appears on screen as text or image, or that is presented as sound, is not
stored as text, image, or sound. All electronic information is stored in digital
form, and it is in its digital form that the information is processed and
communicated. It is only when presented to the human eye or ear that the
information is transformed into something intelligible to human senses.

Ink fixed to a physical surface is the basic condition or form of print. The
stability of printed information, the authority of printed information, and the
trust placed in printed information derive from this physical condition and from
the ability to create multiple copies of an original. As already noted, printed
information is also fixed to particular kinds of physical places. To facilitate
access to information, legal information is typically found in a different place

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71. Collins & Skover, *Paratexts, supra* note 6, at 509–10.
72. CLANCHY, *supra* note 29, at 210.
73. KATSH, ELECTRONIC MEDIA, *supra* note 6, at 35.
74. *Id.* at 136–48.

from economic or medical information. Placing information into electronic form not only liberates the information from its pages but removes the need for specialized spaces to hold particular kinds of information. We are becoming increasingly accustomed to being able to acquire information from our homes that used to be accessible only from an office or library. Yet, as computers are networked, all information should, at least in theory, be accessible from all places. It is already commonplace to access banking information from electronic kiosks on street corners. What might appear strange today, such as consulting online legal materials from a supermarket, is only strange because we have a strong association between physical places and particular kinds of information. In the age of print, placing different kinds of information in different places facilitated both organization and access to the information. Many of our expectations will change as particular kinds of information become less tied to particular places and as all machines become linked in some way to all other machines.

Networks, interactivity, increasing use of visual information, and hypertext all remove or loosen forces that constrained the movement of information in some way. Print was a liberating medium compared to writing because it radically increased the number of reliable and accessible copies of works. Nevertheless, print itself contained a set of invisible and inherent censors, and it is these that the electronic media are lifting. Points of control that are present in print space are no longer present as distribution channels multiply, as copying becomes faster and cheaper, as more information is produced, as economic incentives for working with information increase, and as barriers and boundaries that inhibited working with information are crossed. These kinds of changes underlie the sense that the new technologies are more "technologies of freedom"[75] than technologies of suppression, that the new media are uniquely empowering for individuals and groups, and that Big Brother is an inappropriate metaphor for characterizing the role of the state.

Jeffery Smith has pointed out that the First Amendment owes its existence to "an interaction of principles, practices, and institutions."[76] The First Amendment represented not simply the application of a concept and not merely a reaction to a regime of censorship but a response to a broad range of communicative experiences. The Framers of the Constitution may not have been able to agree upon a coherent set of goals for free speech or press, but they "knew what the press was, knew how crucial a role it could play in shaping government, and knew the multitude of ways in which the journalistic function could be undermined."[77] The First Amendment, under this view, came into existence recognizing the role played by media institutions in the

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75. *See* DE SOLA POOL, *supra* note 16.
76. JEFFERY A. SMITH, PRINTERS AND PRESS FREEDOM at vii (1988).
77. Brief for Respondents at 51, Herbert v. Lando, 441 U.S. 153 (1979) (No. 77-1105).

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ongoing communicative process between citizen and state. Leonard Levy has pointed out how the Framers were familiar with a highly active media environment. He notes how:

> Press criticism of government policies and politicians, on both state and national levels, during the war and in the peaceful years of the 1780s and 1790s, raged as contemptuously and scorchingly as it had against Great Britain in the period between the Stamp Act and the battle of Lexington. Some states gave written constitutional protection to freedom of the press after Independence; others did not. Whether they did or did not, their presses operated as if the law of seditious libel did not exist. To one whose prime concern was law and theory, a legacy of suppression came into focus; to one who looks at newspaper judgments on public men and measures, the revolutionary controversy spurred an expanding legacy of liberty.[78]

The actual experiences and expectations of citizens were a significant influence on constitutional thinking, and these experiences occurred in a communications environment that was much more active than one might assume simply from examining the laws of the time.[79] The particular words chosen for the First Amendment may have been fortuitous but, given the informational environment of the time, the evolution of a law that was more protective of expression than anything that existed pre-Gutenberg was not. As William Mayton has perceptively observed, "One determinant of the 'American idea' of speech and government was that in the society that approved the Constitution the press had in practice become free."[80]

The electronic media foster a new mix of "principles, practices, and institutions" and reshape the "contest"[81] over the control of communication. Franklyn Haiman has recognized that:

> Freedom of communication in America, as in any society, is encouraged and restrained by the interplay of many forces. The history and traditions of a people provide a pervasive backdrop. In

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78. LEONARD LEVY, EMERGENCE OF A FREE PRESS at x (1985).

79. ARTHUR M. SCHLESINGER, JR., PRELUDE TO INDEPENDENCE 51–84 (1957); *see also* ISAIAH THOMAS, THE HISTORY OF PRINTING IN AMERICA (1970).

80. William T. Mayton, *From a Legacy of Suppression to the "Metaphor of the Fourth Estate"*, 39 STAN. L. REV. 139, 142 (1986).

81. Potter Stewart, *Or of the Press*, 26 HASTINGS L.J. 631, 636 (1975). He asserted:
   So far as the Constitution goes, the autonomous press may publish what it knows, and may seek to learn what it can. But this autonomy cuts both ways. The press is free to do battle against secrecy and deception in government. But the press cannot expect from the Constitution any guarantee that it will succeed. There is no constitutional right to have access to particular government information, or to require openness from the bureaucracy. The public's interest in knowing about its government is protected by the guarantee of a Free Press, but the protection is indirect. The Constitution itself is neither a Freedom of Information Act nor an Official Secrets Act. The Constitution, in other words, establishes the contest, not its resolution.
Id.

America that history and those traditions have worked largely in favor of openness and against restraint. The temperaments of the individuals and subcultures that make up a society are also a significant ingredient. In our tremendously heterogeneous mix of racial, ethnic, and nationality groups there is much variety in the impulse to communicate. Some of us are highly expressive; others are exceptionally stoic. Physical environment, too, plays an important role. People who are crowded together on small islands, like the Japanese or English, tend to guard what privacy they can with more inhibitions on their interpersonal and public communication styles than has been the case, for example, in the wide-open spaces of the American West. Ultimately the law of a land, reflecting a composite of these and other forces, determines what its people will be allowed or not allowed to say.[82]

We are, at present, only beginning to understand that the four technological changes described above are bringing us into an environment with novel kinds of pressures and new forces. There is, as already noted, an expanded, more active, and more accessible communications environment because new tools enhance opportunities both to create and communicate. Yet, the constitutional adjustment to the new media will occur not simply because of the appearance of some powerful tools or because enforcement mechanisms are being eroded, but because a new culture or setting is being erected and, ultimately, recognized.

The following is, admittedly, drawn in broad strokes. It is an attempt to look beyond the many ways in which the electronic media open up opportunities for expression and beyond challenges to particular elements of First Amendment doctrine.[83] More particularly, the following sections identify two areas of difference between print and electronic culture that have implications for reconceptualizing the First Amendment. The first concerns the language we use and the metaphors we employ to characterize, describe, and interpret First Amendment issues. The second concerns new kinds of informational entities and activities that are emerging as part of the electronic culture. These two issues signify an advancement into a new cultural as well as functional space, affecting how we think about information and communication as well as what we can do with information.

A. *Ways of Thinking and Speaking: Metaphor and Language*

Language is at the heart of culture and metaphor is at the heart of language. A metaphor is a "cognitive hook,"[84] allowing one to understand

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82. FRANKLYN S. HAIMAN, SPEECH AND LAW IN A FREE SOCIETY 3 (1981).
83. *See supra* notes 43, 48, 59, and 64.
84. BRENDA LAUREL, COMPUTERS AS THEATRE 128 (1991).

something unfamiliar by using terms related to something familiar. Print has supplied law with many metaphors, ranging from "fine print" to "black letter law" to "throwing the book at someone." Metaphors shape how experience is conceptualized,[85] and embedded in metaphors and figures of speech are many of the shared thoughts and assumptions of a culture. Lakoff and Turner have written that:

> Metaphor is a tool so ordinary that we use it unconsciously and automatically, with so little effort that we hardly notice it. It is omnipresent: metaphor suffuses our thoughts, no matter what we are thinking about. It is accessible to everyone: as children, we automatically, as a matter of course, acquire a mastery of everyday metaphor. It is conventional: metaphor is an integral part of our ordinary everyday thought and language. And it is irreplaceable: metaphor allows us to understand our selves and our world in ways that no other modes of thought can.[86]

Similarly, it has been noted that:

> "a word which is used in a metaphorical way is just the tip of the iceberg. A metaphor is an invisible web of terms and associations which underlie the way we speak and think about a concept. It is this extended structure which makes metaphor such a powerful and essential part of our thinking. Metaphors function as natural models, allowing us to take our knowledge of familiar, concrete objects and experiences and use it to give structure to more abstract concepts."[87]

David Anderson has written that "[t]he printing press is our metaphor for freedom of expression, a metaphor blessed by the very words of the first amendment."[88] The First Amendment is not simply a discrete set of commands, but a symbol that reminds us of our accumulated experience with print. When the printing press is the metaphor for the First Amendment, it

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85. Metaphors, it has been written, are
   pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature.
       The concepts that govern our thought are not just matters of the intellect. They also govern our everyday functioning, down to the most mundane details. Our concepts structure what we perceive, how we get around in the world, and how we relate to other people. Our conceptual system thus plays a central role in defining our everyday realities. If we are right in suggesting that our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor.
GEORGE LAKOFF & MARK JOHNSON, METAPHORS WE LIVE BY 3 (1980).
   86. GEORGE LAKOFF & MARK TURNER, MORE THAN COOL REASON: A FIELD GUIDE TO POETIC METAPHOR at xi (1989).
   87. M. Ethan Katsh, *Law in a Digital World: Computer Networks and Cyberspace*, 38 VILL. L. REV. 403, 468 n.109 (1993) (quoting Tom Erickson, *Working with Interface Metaphors, in* THE ART OF HUMAN-COMPUTER INTERFACE DESIGN 66 (Brenda Laurel ed., 1990)).
   88. David A. Anderson, Book Review, 17 U.C. DAVIS L. REV. 731, 732 (1984).

implies the dominance of a mass medium and suggests a mindset[89] that, like ink on paper, sees choices as black or white, either/or, constitutional or unconstitutional.[90] There are other metaphors used for the First Amendment, such as the use of the soapbox or town meeting in connection with the Speech Clause; the "marketplace of ideas"[91] is the most commonly employed metaphor in connection with the First Amendment, serving as the "pictorial backdrop to the legal arguments surrounding free speech issues."[92] The public sense of an intimate link between freedom of the press as a constitutional guarantee and the printing press as a technology, however, remains quite strong.

At some point in the not too distant future, the printing press, and all that is implied by the printing press (and the "Press"), will no longer be the technology that shapes our thoughts and expectations. The search for new metaphors has some way to go before our sense of communication moves away from print. If the manner in which we understand is linked to the figures

89. The impact of the image of the printed page was a major theme in the writings of McLuhan, who argued that the "effects of technology do not occur at the level of opinions or concepts, but alter sense ratios or patterns of perception steadily and without any resistance." McLUHAN, UNDERSTANDING MEDIA, *supra* note 9, at 33. More generally, the sociologist Peter Berger has argued that:

> Once produced, the tool has a being of its own that cannot be readily changed by those who employ it. Indeed, the tool (say, an agricultural implement) may even enforce the logic of its being upon its users, sometimes in a way that may not be particularly agreeable to them. For instance, a plow, though obviously a human product, is an external object, not only in the sense that its users may fall over it and hurt themselves as a result, just as they may by falling over a rock or a stump or any other natural object. More interestingly, the plow may compel its users to arrange their agricultural activity, and perhaps also other aspects of their lives, in a way that conforms to *its* own logic, and that may have been neither intended nor foreseen by those who originally devised it. The same objectivity, however, characterizes the non-material elements of culture as well. Man invents a language and then finds that both his speaking and his thinking are dominated by its grammar.

PETER L. BERGER, THE SACRED CANOPY 9 (1967).

90. Richard Lanham has observed, concerning prose, that, "So used are we to thinking black-and-white, continuous printed prose the norm of conceptual utterance, that it has taken a series of theoretical attacks and technological metamorphoses to make us see it for what it is: an act of extraordinary stylization, of remarkable, expressive self-denial." RICHARD LANHAM, THE ELECTRONIC WORD: DEMOCRACY, TECHNOLOGY, AND THE ARTS 9 (1993). In summarizing McLuhan's work, James Carey notes:

> Besides making us dependent on the eye, printing imposes a particular logic on the organization of visual experience. Print organizes reality into discrete, uniform, harmonious, causal relations. The visual arrangement of the printed page becomes a perceptual model by which all reality is organized. The mental set of print—the desire to break things down into elementary units (words), the tendency to see reality in discrete units, to find causal relations and linear serial order (left to right arrangement of the page), to find orderly structure in nature (the orderly geometry of the printed page)—is transferred to all other social activities. Thus, science and government, art and architecture, work and education become organized in terms of the implicit assumption built into the dominant medium of communication.

James W. Carey, *Harold Adams Innis and Marshall McLuhan,* 27 ANTIOCH REV. 5, 19 (1967).

91. Justice Holmes, who is given credit for the "marketplace of ideas" expression, actually wrote that "the ultimate good desired is better reached by free trade in ideas [and] the best test of truth is the power of the thought to get itself accepted in the competition of the market." Abrams v. United States, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting). The evolution of the "marketplace of ideas" metaphor is summarized in HAIG BOSMAJIAN, METAPHOR AND REASON IN JUDICIAL OPINIONS 49–72 (1992).

92. Scott E. Sundby, *"Everyman"'s Fourth Amendment: Privacy or Mutual Trust Between Government and Citizen?,* 94 COLUM. L. REV. 1751, 1774 (1994).

of speech we employ, we should expect new metaphors to surface as the link between printing presses and freedom of the press becomes more tenuous. That link will erode as we begin to see information through the frame of the computer rather than through print.

Many metaphors and symbols of print, whether they are containers (books), or places (libraries), or the printing press itself, are static and suggest that controlling information and communication is analogous to controlling a place. The "marketplace of ideas" metaphor is process-oriented, but constitutionality is equated with keeping government out of the marketplace, by noninterference, and by a nonrelationship with the market. We have some examples of government structuring of a segment of the communications market, with broadcast licenses and the fairness doctrine, but no real frame of reference for governmental participation in, and enhancement of the quality of, the marketplace.[93]

One perceptive commentator of our new environment has pointed out that as digital technologies are replacing print, "a new logic has emerged. The great power struggles of cyberspace will be over topology, connectivity, and electronic access—not borders and territory."[94] Any new metaphor will have to embody a complex change in state-citizen relationships, one that recognizes that the "network of communication" is quite different from the "marketplace of ideas," and that connectivity does not necessarily imply a loss of freedom. The marketplace of ideas was "free" and "uninhibited" only to those who defined freedom in reference to government activity. In the "network of communication," government is closer to the communications process, because everyone is closer to the communications process. Yet, the Orwellian fear of authority and control is less present, and new interactions and relationships make the distribution of a uniform and uncontested message by government unlikely.

Using the network as metaphor has been suggested by Kevin Kelly, who writes:

> The Atom is the icon of 20th century science.
>   The popular symbol of the atom is stark: a black dot encircled by the hairline orbits of several other dots. The Atom whirls alone, the epitome of singleness. It is the metaphor for individuality: atomic. It is the irreducible seat of strength. The Atom stands for power and knowledge and certainty. It is as dependable as a circle, as regular as round.
>   . . . .
>   The internal circles of the Atom mirror the cosmos, at once a law-abiding nucleus of energy, and at the same time the concentric heavenly spheres spinning in the galaxy. In the center is the *animus*,

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93. *See generally* LEE C. BOLLINGER, IMAGES OF A FREE PRESS (1991).
94. MITCHELL, *supra* note 14.

the It, the life force, holding all to their appropriate whirling stations. The symbolic Atoms' sure orbits and definite interstices represent the understanding of the universe made known. The Atom conveys the naked power of simplicity. . . .

The Atom is the past. The symbol of science for the next century is the dynamical Net.

The Net icon has no center—it is a bunch of dots connected to other dots—a cobweb of arrows pouring into each other, squirming together like a nest of snakes, the restless image fading at indeterminate edges. The Net is the archetype—always the same picture—displayed to represent all circuits, all intelligence, all interdependence, all things economic and social and ecological, all communications, all democracy, all groups, all large systems. The icon is slippery, ensnaring the unwary in its paradox of no beginning, no end, no center. Or, all beginning, all end, pure center.[95]

Kelly's images may seem like science fiction; he is attempting, however, to acquaint us with a space that, as we encounter it, may be disorienting because familiar labels, categories, and metaphors lose meaning. I have focused on networks, interactivity, visual communication, and hypertext because these four facets of digital information processing all remove constraints that were inherent in print, and all work to displace print, by moving information from being fixed on a page and bound in a book, to a form or state that is much less "fixed."

Language not only reveals what our experiences with media have been, but also serves as a guide as to how future experiences may be approached. Kelly's net or web[96] metaphors, and perhaps even the overused and inappropriate "information superhighway" metaphor, focus primarily on the manner in which communication moves, particularly on its ever-increasing rate of speed, and the links that necessarily exist between all individuals, groups, and institutions. The First Amendment, however, is not oriented toward the conditions of communication or the speed at which it occurs as much as it is concerned with rights of communication and whether there is interference with those rights. As new ways of describing and characterizing digital communication come into use, it will be important to determine whether rights and the legal framework for free expression receive support in addition to the considerable support provided to expressive and creative activities.

Print was an ally of the concept of rights. The printed page itself was an entity with boundaries. It is not clear whether print has merely been a symbol for rights, or whether the fact that the source of rights is in books and documents, fixed on pages with clear margins, has affected how we conceive

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95. KEVIN KELLY, OUT OF CONTROL 25-26 (1994).

96. For a discussion of the "seamless web" metaphor as it applies to law, see KATSH. LAW IN A DIGITAL WORLD, *supra* note 7, at 21.

of and define rights. Under either scenario, a more fluid, less centered, and less boundaried communications system raises questions about whether the new forms of communication can provide the same level of support as print for a rights-oriented model.

A fluid and centerless system is not necessarily a structureless system; one of the main challenges to cyberspace will be to create structures and institutions in an arena where support does not come from physical places and physical structures. Professor Steven Shiffrin has argued for a First Amendment jurisprudence oriented around dissent, a position he sees as one based on a "structure without a center."[97] He also recognizes, however, that this is a challenging position and, quoting Derrida, notes:

> "The function of this center was not only to orient, balance, and organize the structure—one cannot in fact conceive of an unorganized structure—but above all to make sure that the organizing principle of the structure would limit what we might call the *play* of the structure. By orienting and organizing the coherence of the system, the center of a structure permits the play of its elements inside the total form. And even today the notion of a structure lacking any center represents the unthinkable itself."[98]

Justice Cardozo warned that "[m]etaphors in law are to be narrowly watched, for starting as devices to liberate thought, they end often by enslaving it."[99] Our new models of communication require us to consider what were previously only hypothetical situations and perspectives. A shift from one type of medium to another involves a "revolution in perception" as much as in information.[100] There are significant changes in the movement of information and the manner in which it moves, but the shift also involves electronic logic challenging print logic and an electronic culture challenging print culture. To discern the process of change in First Amendment jurisprudence in this context will require being more sensitive to patterns of cases than to the holdings of particular decisions. It will only be over time that there will be less reliance on static and spatial metaphors, and more understanding, as Milner Ball has argued, of "law as a medium—law as connecting rather than disconnecting, enhancing a flow of dialogue,"[101] and "allowing movement and circulation."[102]

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97. SHIFFRIN, *supra* note 21, at 225.
98. *Id.* (quoting JACQUES DERRIDA, WRITING AND DIFFERENCE 278–79 (1978)).
99. Berky v. Third Ave. Ry., 155 N.E. 58, 61 (N.Y. 1926).
100. Anthony Smith, *On Audio and Visual Technologies: A Future for the Printed Word?*, in THE WRITTEN WORD: LITERACY IN TRANSITION 171, 191 (Gerd Baumann ed., 1986).
101. MILNER S. BALL, LYING DOWN TOGETHER: LAW, METAPHOR, AND THEOLOGY 122 (1985).
102. *Id.* at 28.

B.   *Ways of Acting: New Relationships, Entities, and Institutions*   ,

Paul Saffo has written that institutions are coming to be "defined by their relationships, not by their organizational boundaries."[103] What our experience with cyberspace reveals most clearly is that we are in an interconnected and overlapping set of spaces rather than a world where territory discretely and definitively separates sovereign states. Cyberspace, with its ability to move information across borders at electronic speed, will not replace either political entities or manufacturers of durable goods, though it does overlay a global communications network on top of a world that is and has been politically organized around territory and economically dependent upon the transportation of physical goods and resources. It does not necessarily cause old entities to vanish but it does change our experience with political and economic entities, our relationship with them, and the relationships between and among such entities.

The issue of boundaries, and the impact of the new media on boundaries of all kinds, is one of the core issues of cyberspace. The blurring of physical boundaries occurs because communication is no longer dependent upon transportation. Those in control of physical boundaries—nation-states—lose some ability to control communication that might, quite literally, have been stopped at the border. While this alone makes it difficult for authoritarian regimes to thrive in a digital world, the boundaries of power are affected in several other ways, each of which places pressure on models of regulation that exist even in less authoritarian forms of government.

As Saffo suggests, the new environment raises questions about the vulnerability of existing institutions not simply because there is a loss of authority by an existing institution but because there is competition with many new sources of power and authority. It is the building and addition of many new relationships on top of what remains of the old that is characteristic of a shift from a print environment to a digital one. It is movement from a medium that respected a hard-edged concept of sovereignty to a medium where shared authority may be a more suitable paradigm. The issue of boundaries, therefore, touches the First Amendment not simply by changing how information may travel into or out of countries—removing border checkpoints as a place for government to assert its authority to control communication—but by questioning many existing assumptions and relationships concerning states and citizens.

Cyberspace encourages the formation of entities and relationships linking spatially separated people and groups in ways that could not have occurred in a print environment. Such entities and relationships will have more diffuse

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103. Paul Saffo, *Business Goes Organic—The Acceleration of Technology Developments in 1995 Will Help Make Business More Like Biology*, INFORMATIONWEEK, Jan. 2, 1995, at 56.

boundaries than territorial entities and, increasingly, will overlap territorial entities. The information processing orientation of groups is already becoming a more important criterion for categorizing institutions than the labels that were typically applied in the past. For example, Nicholas Negroponte, director of the media lab at MIT, has contended that, in the past, "People thought of themselves as being in the newspaper business, or movies, music and so on. But they're really not anymore. They're in the bit manufacturing business."[104] This has been echoed by Vice President Al Gore, who has asserted:

> [I]n the ensuing expansion of the information business, the new marketplace will no longer be divided along current sectoral lines. There may not be cable companies or phone companies or computer companies, as such. Everyone will be in the bit business. The functions provided will define the marketplace. There will be information conduits, information appliances and information consumers.[105]

Richard Lanham has pointed out that

> many areas of endeavor in America pressured by technological change have already had to decide what business they were really in, and those making the narrow choice have usually not fared well. The railroads had to decide whether they were in the transportation business or the railroad business; they chose the latter and gradual extinction.[106]

Recently, the CEO of a large trucking firm, Schneider National, commented that "[p]eople get the mistaken impression that our business is running trucks."[107] Rather, his business "is really an information system masquerading as a trucking line."[108] The CEO's change in thinking about his firm occurred as he began employing the new technologies to distribute information to his trucks and his drivers. Each tractor-trailer truck comes equipped with a satellite receiver and a small personal computer; drivers receive a continuing stream of information ranging from road conditions to changes in pickups and deliveries.

Similarly, changing perceptions are at the heart of a Ford Motor Company plant that produces electronic components such as engine controllers, antilock brakes, and speed control devices. All of these products tend to

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104. Evan Ramstad, *Translation of Techno Covergence?*, L.A. TIMES, Nov. 10, 1993, at D9.
105. Vice President Al Gore, Speech to Academy of Television Arts and Sciences (Jan. 11, 1994) (on file with author).
106. LANHAM, *supra* note 90, at 8.
107. Marc Levinson, *Riding the Data Highway*, NEWSWEEK, Mar. 21, 1994, at 54.
108. *Id.*

contain microprocessors and would generally be considered hardware. Yet, the plant is viewed as being "more of a software business than hardware."[109] The reason for this is that the plant's primary focus is on being able to respond quickly to information and to move "[f]rom the era of mass production to the era of mass customization."[110] Ford can do this if it can track every component and share information instantaneously about inventory and orders with suppliers and designers, wherever they are located.

The reconceptualization of activities as new patterns of communication are developed touches states as much as private entities. As new relationships are formed, as boundaries are crossed, as overlapping jurisdictions are established, and as information sharing occurs, the application of concepts such as sovereignty and the use of distinctions such as public/private,[111] ownership/access, foreign/local, external/internal, and economic/political will raise more questions than they did in the past. The hypertext paradigm suggests that the resolution of these issues more likely will be negotiated by diverse entities rather than imposed by a sovereign entity. Cyberspace liberates information that had been effectively hidden or inaccessible under print's regime and may empower groups or individuals whose communicative capabilities were economically restricted in print culture. It also makes vulnerable some of the elements of the structure under which controversies involving information have been resolved in the past.

One irony of a process of communication that stores information in binary form (as ones and zeroes) is that it encourages nonbinary patterns of thinking and of representing information. The edges of images become ambiguous as white is joined to black by many colors or shades of gray. Precision is aided not by the designation of boundaried categories but by "fuzzy" logic.[112] Powerful personal computers, as noted earlier, bridge the chasm that print had created between word and image. Interactivity and hypertext allow readers and users to organize material in ways not considered by the author and, indeed, to create an arguably new work out of the work of multiple authors. Most notable, perhaps, for the First Amendment, is that forms of information become fungible since what will appear as text or as sound or as image is all stored in the same way: in digital form. Perhaps the most visible of First Amendment distinctions, that between speech and press,[113]

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109. John Holusha, *Industry Is Learning To Love Agility*, N.Y. TIMES, May 25, 1994, at D1.

110. *Id.* at D5.

111. David J. Goldstone, *The Public Forum Doctrine in the Age of the Information Superhighway*, 46 HASTINGS L.J. 335 (1995).

112. *See generally* BART KOSKO, FUZZY THINKING: THE NEW SCIENCE OF FUZZY LOGIC (1993).

113. *See generally* David A. Anderson, *The Origins of the Press Clause*, 30 UCLA L. REV. 455 (1983); Stephen L. Carter, *Does the First Amendment Protect More than Free Speech?*, 33 WM. & MARY L. REV. 871 (1992); David Lange, *The Speech and Press Clauses*, 23 UCLA L. REV. 77 (1975); Melville Nimmer, *Introduction—Is Freedom of the Press a Redundancy: What Does It Add to Freedom of Speech?*, 26 HASTINGS L.J. 639 (1975); Stewart, *supra* note 81, at 631.

between what is printed and what is spoken, becomes questionable in an environment in which both text and the spoken word are represented digitally and the paradigm of electronic publishing is the placement of a single copy of a work on a single accessible computer.

The potential difficulty in distinguishing between forms of communication is already apparent in the difficulty in distinguishing between the "press," or "news media," and other providers and distributors of information. Thomas Kuhn has argued that "[p]aradigms gain their status because they are more successful than their competitors in solving a few problems that the group of practitioners has come to recognize as acute."[114] The challenge to students of the First Amendment during an age of digital media will not only be to adapt to an environment in which cases will involve issues, disputes, and entities that did not surface or were not present in print culture or bear only surface similarity to print-environment cases, but to consider such cases "with the notion that virtually all electronic communication is taking on the characteristics of computers and digital networks."[115]

The history of the First Amendment is a history of shifting concerns and priorities. We have moved from an era in which prior restraint was the principal concern[116] to an era in which successful enforcement of the doctrine is difficult to imagine.[117] Even in the last forty years, Cass Sunstein has written, "the American law of freedom of speech experienced nothing short of a revolution."[118] The electronic environment is highly supportive of communication, but it will be particularly challenging to those concerned with how involved government should be in the communicative process. The marketplace of ideas is now global as well as national and individual as well as institutional. The role and power of government are shifting in ways that are not easy to imagine but that inevitably will raise issues of constitutional significance. Out of these new experiences will emerge concerns that may, for our age, have the significance of prior restraint.[119]

William Mitchell has eloquently described how

> Romulus, according to Plutarch's Life, plowed a deep furrow to delineate the boundary of Rome and thought the task so important that he killed the interfering Remus. Roman law provided severe punishment for those who tampered with boundary stones, and the

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114. THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 23 (1962).

115. Patrick O'Neill, *Optimizing and Restricting the Flow of Information: Remodeling the First Amendment for a Convergent World*, 55 U. PITT. L. REV. 1057, 1059 (1994).

116. CASS R. SUNSTEIN, DEMOCRACY AND THE PROBLEM OF FREE SPEECH at xii–xiv (1993).

117. *See supra* text accompanying note 38.

118. SUNSTEIN, *supra* note 116, at 250.

119. One possible issue involves anonymous expression. In an age where information transactions leave trails, does an individual have a constitutional right to use a method of encryption that prevents government from observing the trail and its contents? *See* A. Michael Froomkin, *The Metaphor is the Key: Cryptography, the Clipper Chip and the Constitution*, 143 U. PA. L. REV. 709 (1995).

Roman pantheon gave a proud place to Terminus—god of boundaries.
Spatial boundaries were important because they marked limits of
power and control, and so it is today; the maps negotiated by
politicians and drafted by urban planners are patchworks of ownership
boundaries, zoning boundaries, and jurisdictional boundaries. Within
jurisdictional borders, local laws and customs apply, local power is
exerted by some over others, and local police and military forces
maintain power by the potential or actual use of violence. But bits
answer to terminals, not Terminus; these lines on the ground mean
little in cyberspace.[120]

We have done more than tamper with boundaries. Old boundaries, and
even old countries, have been erased from the world map. In our concern for
the preservation and continuation of fundamental societal concerns, we need
to understand that new spaces are being created and, with considerable
imagination, new maps will be drawn to represent new spheres of authority
and new models of state/nonstate relationships. Such maps will take note of
virtual or electronic relationships and spheres of authority that transcend
territory. It is these new maps that will represent the setting upon which the
future of the First Amendment will be drawn.

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120. MITCHELL, *supra* note 14, ch. 4.