theory of definition as accepted practice among philosophers and as a synthesis of already articulated ideas. Yet, his assertion that definitions are fundamentally circular would be rejected out of hand by a significant portion of analytical philosophers. His argument is at least as controversial as Richard Rorty’s claims that we have only arguments to make about how the world should work, unsupported by truth or reality.

Our obligation is only to construct a world in which we can live, to propose a world in which we should live, that is persuasive enough to be accepted by our culture, despite the inherent falsity of proof. Rorty’s project is as much a thoroughgoing attack on the practice of analytical philosophy, and one that even many pragmatists resist, as it is a proposal for how discourse can negotiate society’s conflicts. Schiappa’s project is more an anthem for rhetoric, urging us to take control away from the Platonic bonds of definition that have enslaved us than it is a synthesis of ideas that everyone agrees with. He implicitly lays the groundwork for this Platonic attack in his 1999 book, *The Beginnings of Rhetorical Theory in Classical Greece*. Perhaps Schiappa wanted to clothe the theory in *Defining Reality* in unassuming practicality in order to avoid that controversy of the 1999 book, which inspired frenzied scholarly conversation about the history of rhetoric for years after its publication. But I would have been more comfortable if he had given in to the radical notions that this rhetorical statement propounds. *Defining Reality* should serve as a call for scholars of rhetoric to construct a better world through our practices of argument and through a normative scholarly enterprise of analysis.


Reviewed by Byron Hawk, George Mason University

Though early hypertext theory recognized its print precursors in the texts of Roland Barthes and Jacques Derrida, most theorists initially linked hypertext conceptually to one medium—digital texts—and focused on one primary element to distinguish these texts from print: the link. Espen Aarseth remedied this narrow view of hypertext by articulating the
concept of cybertext, which for him cuts across multiple media: hypertexts, literature, computer games. Cybertexts take into consideration the functionality of a text and the way it produces possible narrative paths for a reader to engage. Hayles pushes the development of new media theory one more step with the concept of technotext. A technotext will self-consciously select a few physical elements of a text to foreground and work into its thematic concerns. This concept moves from functionality (or physicality) to materiality, which emerges from the way a text uses its physical elements and interactions with users to create meaning. As with Aarseth, Hayles recognizes that this perspective potentially cuts across all media. When Vannevar Bush, the father of hypertext, imagined the possibility of a hypertext system, he was thinking in mechanical terms, not in terms of print or digital texts. But since then, most hypertext and new media theory have focused almost solely on digital media and the computer. If hypertext theory is restricted by media, then analyses lose site of the ecology that surrounds any text and how that embodiment is crucial to understanding. For Hayles, “What Bush’s formulation neglects . . . is the feedback loop from materiality to mind.” His theory that the memex was superior because it worked like the mind, via association, neglects the body. The significance of Hayles’ book is that it seeks to explore hypertext as a rhetorical form that cuts across media, and how those media structure embodiment as a primary means of signification—she moves from mechanical or digital texts to all texts and from association and the link to materiality. Hayles writes, “Literary critics have long accepted that form is content and content is form.” But they need to begin to recognize that “Materiality is content, and content is materiality.”

In “The Moment of Complexity,” Mark Taylor argues that in her book *How We Became Posthuman* Hayles sees a rigid form/content split, which leaves information as immaterial (105–06). Taylor’s placement of Hayles with such an “indefensible opposition” allows him to situate himself as proposing “the complication of the relation between information and the so called material conditions of life” (106). His reading of Hayles seems out of place in the context of *How We Became Posthuman* as a whole and even in the quote he pulls from that text. But if this distinction still remains unanswered by *How We Became Posthuman*, then *Writing Machines* makes it absolutely clear that Hayles no longer holds that position (or assumption). She clearly sees no oppositional distinction between materiality and information. For example, Hayles developed a graduate course, team-taught with design and media arts professor Bill Seaman, that brought together students from the visual and
the textual arts. One student installation project featured a kiosk that literally invited the user to interface with the installation and participate in producing the text. Choosing links on the computer screen produced other images/words projected on the wall and printed out text on an accompanying printer. The project highlights the words as images but also creates "new sensory, physical, and metaphysical relationships between the user and the database." This important aspect of materiality, which emerges from interactions between physical properties and a work's artistic strategies via a user, makes criticisms like Taylor's moot. Hayles' move to technotext gives her a critical strategy that goes beyond any simplistic form/content split and moves hypertext into the domain of materiality. The notion of cybertext as primarily functional and semiotic privileges computer games as its paradigmatic medium. Technotexts are open to all media and highlight the relationship(s) among materiality, functionality, and textuality. For Hayles, "Materiality . . . emerges from interactions between physical properties and a work's artistic strategies." Materiality is not simply the physicality of location but of physicality in a medial ecology with other bodies and texts, machines, and contexts.

In her critical apparatus, Hayles establishes three key terms that play out her notion of materiality: material metaphor, technotexts, and media-specific analysis. Traditionally, metaphor denotes the transference of meaning between words. Material metaphor, however, transfers sense or meaning between a network of symbols and a material apparatus. For example, the book as a physical object is also a metaphor: its physical properties structure its traditional metaphors, which in turn structure the way users conceptualize their interaction with it as a material technology. It defines the unit of reading (based on the page), and the linear order of reading (based on the spine/binding) and the notion of a dual surface (based on the page having a front and back) reinforce a binary, surface/depth conception of meaning. Since a change in media would restructure these metaphors, analyses of material metaphors would foreground "the traffic between words and physical artifacts" and the transformation of "the metaphoric network structuring the relation of word and world." Hayles calls literary works that foreground the materiality of the text in the work itself, forming a feedback loop between textuality and materiality, "technotexts." Such works push literary criticism toward the inevitability of taking bodies seriously, something that allows her to position technotext as an alternative to both hypertext and cybertext. The term technotext explicitly connects the technology used to the textuality produced—hyper and cyber both imply the digital, techno implies any
technology. The notion of "writing machines" is "what technotechs do when they bring into view the machinery that gives their verbal construc-
tions physical reality." Technotechs and their analyses foreground such
machinations. Technotechs, then, require a distinct type of criticism that
Hayles calls "media-specific analysis." All texts must be embodied to
exist and each specific embodiment affects linguistic, semiotic, and
rhetorical elements of the work. Physicality implies that the specific
properties of hypertext (like the link) would function the same way across
all hypertexts. But media-specific analyses would recognize that any
work's materiality will be different with each enaction, user, and ecology.
All forms of literature, for example, participate in a medial ecology of
remediation (Bolter). Media influence other media, so the analysis of a
book, for instance, must take into consideration the influences of televi-
sions and computers on the evolving nature of the book. Media-specific
analyses would look at this ecology and examine the ways various media
construct the particular work under analysis. They would examine the
"interplay between form, content, and medium" by being attentive both
to the specificity of form and function and to material imitations of one
medium in another.

In order to show that media-specific analysis is not simply about
electronic texts, Hayles turns her critical apparatus toward three types of
"writing machines": hypertexts, artist books, and novels, specifically
Lexia to Pereplexia, A Humument, and House of Leaves.

Hayles turns her critical insights toward Talan Memmott's Lexia to
Pereplexia, seeing it as "a technotext that structures users as well as
environments." Lexia to Pereplexia, according to Hayles, needs to be
considered not simply as a hypertext but as "a fully multimedia work in
which screen design and software functionality are part of its signifying
practices." The work, for example, is structured so that slight cursor
movements will take away or replace text, taking any "writerly" control
away from the user and replacing the reader's agency with timed com-
puter sequences or animations. The act of choosing a link, so important
to early hypertext theory, is now distributed throughout the circuit of user
and machine. By creating noise via computer agency, any possibility for
linearity or coherency breaks down but creates the possibility for the
emergence of meaning through interaction. The user becomes part of the
text's performance, which establishes a medial ecology—the work re-
quires the connection to a body that can engage it through sight, sound,
and kinesthesia. Hayles concludes, "Amidst these complexities, what is
clearly established is not the superiority of code to flesh but metaphoric
networks that map electronic writing onto fluid bodies.” Memmott employs material metaphors to highlight his own text’s material ecology by 1) creating a creole language that combines English and computer code that breaks down the binary between natural language and programming language, 2) turning classical myths such as Narcissus and Minoan funeral rites into myths of the co-creation of human subjects and information technology, and 3) developing a symbolic visual language such as eyes that mutate into I-terminals. The text uses these metaphors to highlight its own use of materiality, ultimately representing its own ecological enactment via the user.

In order to further examine the notion of technotext, Hayles turns again to a reading of a specific text: Tom Philips’s artist book *A Humument*. Phillips took a preexisting text, the Victorian novel *A Human Document* by William Mallock, “and ‘treated’ it by covering over the pages with images that left only a few of the original words visible.” The result was a completely new text, more poetic and visual than the original linear novel. Rather than allowing the fixed conventions of print to impose a false transparency on the book (Lanham), Phillips’ combination of word and image highlights the machinery of the book and creates an explicit circuit of meaning with the reader. For Hayles, the concrete reality of the page—the page as a material artifact that can be cut/pasted; redesigned through gutters, margins, and space; and refashioned through the material fibers of the page that interact with various paints in various ways—links the reader’s body to the text in a particular way. She found that reading artist books from back to front often reversed the perspective of the story told via images. Understanding the texts became a matter of the reader’s embodiment with relation to the book—a shift in embodiment generated a shift in meaning. The space of the pages becomes a “space to explore rather than a line to follow.” This makes reading more of a physical activity than a production of voice in inner speech, which means that readers are less likely to read linearly and more likely to read randomly. Indeed, this is the legacy of the book: “In the Middles Ages the codex book was heralded as a great improvement over the scroll precisely because it allowed random reading.” The very materiality of *A Humument* as a book, and as a book of a particular kind, actually makes it more hypertextual than many electronic fictions, establishing it as an exemplary technotext.

Media-specific analyses of technotexts presuppose that “it is impossible not to create meaning through a work’s materiality. Even when the interface is rendered as transparent as possible, this very immediacy is
itself an act of meaning-making that positions the reader in a specific material relationship with the imaginative world evoked by the text” (emphasis added). Even though this transparency is the hallmark desire of the book, Hayles goes on to show that the book doesn’t necessarily have to hide its (re)mediation. Mark Danielewski’s *House of Leaves*, for example, presents itself as a typical horror story, but it also interrogates the crisis of representation through its textuality and materiality. The narrative is structured around a family’s film that documents their haunted house. But although much textual and testimonial evidence of the film exists, the actual film itself is absent: its traces exist in various media forms—other films, video, photography, tattoos, typewriters, telegraphy, handwriting, computers—providing an absent center for the various narratives that traverse the text. The characters in the story can also appear only through their absence. Their consciousnesses are never separate from mediation through video, interview transcripts, or written letters; they “exist only because they have been recorded.” Hayles reads these as processes of remediation: “in a frenzy of remediation” *House of Leaves* “attempts to eat all other media.” In addition to these textual remediations, *House of Leaves* creates effects that could only be produced by the print book. Danielewski uses varying typography, a pastiche sense of design, and multi-dimensional layout to create a labyrinthine text that emulates the labyrinthine space of the haunted house. For example, certain words, mostly associated with the house, are placed in a blue box that is transparent—the word exists on the next page but in reverse, allowing the reader to see through the page. In Hayles’ reading, “Treating the page as a window can be seen as a way to compensate for the House’s viewless interior.” The same kind of transparency wouldn’t exist in the computer world. Hayles puts it nicely: “The dynamic interplay between words, nonverbal marks, and physical properties of the page work together to construct the book’s materiality so that it functions as a mirror to the mysterious House, reversing, reflecting and inverting its characteristics even as it foregrounds its own role as a container for the fictional universe in which such an impossible object could exist.” The book uses transparency to highlight its lack of transparency and remediations of other media. It is really the dynamic of these textual and material (re)mediations that makes *House of Leaves* a specific medium. It is a key example of the need for media-specific analysis. Each technotext has to be taken as a particular writing machine.

Hayles notes that the great achievement of *House of Leaves* is that it “locates the book within the remediations of the digital era.” For me,
much the same thing could be said of Hayles’ book—it experiments with the possibilities of print in a media culture (*Writing Machines* is a “writing machine”). As a part of the Mediaworks series at MIT, the book is a collaboration between N. Katherine Hayles, who writes texts, and Anne Burdick, who designs texts. The book is reminiscent of *War and Peace in the Global Village* by Marshall McLuhan and Questin Fiore in that part of its purpose is to engage in/with the designed elements of text and their relation to images. Burdick, for example, does a nice job of bringing in images of Phillips’ text and merging/layering them with Hayles’ text, adding more layers of hypertextuality. It’s clear that *Writing Machines* is also cognizant of the way the book feels. The book combines elements of graphic display with the elements of feel/touch (the book is small and fits in the hand like a palm pilot) to create a book that is attempting to embody the concepts it articulates. The ridges on the cover give body to the barcode images that adorn the book and the sleek feel of the pages emulates the shine of the computer screen. I felt that reading *Writing Machines* was much like reading a computer screen. Even though my urge to annotate texts knows no bounds, I just couldn’t bring myself to mark on the glossy pages. Not just because I didn’t want to tarnish them, but because it didn’t seem to fit the materiality of the text any more than marking up my computer—the book even creates “pull-quotes” in the text through a fish-eye lens effect, evoking the curvature of the screen. I highlight these aspects of the book because Hayles’ argument is founded on the materiality of textuality and the technologies that inscribe texts. The book clearly marks the trajectory of new media works as embodying their textual content through the media’s forms and for this reason alone is worth reading and using in classes on new media. In addition to providing a nice discussion of the issues currently surrounding electracy, it is also a skillful example of how materiality affects the larger medial ecology around a text, no matter what medium expresses it.

The book also performs, what seems to me, the electronic genre of mystory developed by Gregory Ulmer. The combination of autobiography, critical analysis, and visual design in *Writing Machines* forms a pattern “not at the level of meaning or theme” but “at the level of repeating signifiers—words and graphics”—which, as Ulmer states, “is why each discourse level of the mystery must be documented with details that address the senses.” Ulmer’s depiction of the genre suggests the necessity for media-specific analysis because the genre will always create a singularity through its assemblage of personal narrative and theory via various new media. As with mystory, critical analysis in *Writing Ma-
chines is contextualized and linked through a biographical account of the
development of theory through experience. Hayles develops her mystery
through a character named Kaye, who is both fictional and literal, and
short narratives of her life interspersed as excurses between chapters on
theory and criticism. This approach leads Hayles to question the nature
of theory much in the way Ulmer does. In science, theory is induced from
experience. More corresponding particular experiences give more weight,
and generality, to the theory. In literature, theory is used as a lens to
deduce meaning from texts. The theory’s power comes from producing
new meanings in texts rather than to produce predictable results. Once the
readings produced by a theory have become so general as to be predict­
able, it is time to develop a new theory. “Kaye” hopes that it is time for
such a development, musing, “Maybe now is a good time for a double­
braided text where the generalities of theory and the particularities of
personal experience can both speak.” Her call for a “double-braided text”
that is both personal and theoretical and mediates induction and deduc­
tion is enacted in the text through her Ulmeresque “mystery” and invokes
Ulmer’s discussions of conduction, which operates between induction
and deduction specifically through the genre of mystery (Teletthyere).
Such is the task of media-specific analysis: conducing theory from the
particular materiality of specific media texts through the specific experi­
ences of a particular user.

I think Writing Machines is important because it clearly shows the
directions that digital writing is taking—in terms of both materiality and
genre. There are certain implications of this direction that trouble me,
however. As the technology develops, it becomes less and less likely that
a single artist/programmer/writer can keep up. The tradition of artist
books cannot be fully realized in the digital domain. One individual can
no longer keep up with the technological, and the visual, and the textual
abilities that new media require. Collaborations like the ones Hayles and
Seaman produce in their class will be inevitable and profitable. But I fear
that the age-old divisions will remain between the artist, writer, progra­
mmer, and critic. New media has the possibility to merge all of these talents
but makes it more difficult for people in English departments to be
practitioners, potentially relegating many to critics of the new genres
being developed. As Hayles notes, Michael Joyce, a predominant founder
of the field, recently announced that he was leaving electracy and going
back to print because “his growth as a writer and thinker required it.” The
larger implication of this pronouncement is revealed by Robert Coover
who “also expressed concern about the relentless cycles of software
innovation and obsolescence. He felt he could not continue to master all of the new software programs coming out at an accelerating pace and still devote his energy to what he cared about most, crafting words.” I hope it is not the case that only our students will be able to collaborate on works through the crossdisciplinary courses that we will be creating. I’d like to think that in the future I will be able to collaborate on and produce works in new media rather than simply comment on them.

**Works Cited**


Reviewed by Elizabeth Giddens, Kennesaw State University

*Discourses in Place* sets forth an analytical method called geosemiotics that researchers may use to analyze the meanings inherent in public settings, the sign systems encountered in the material world, and the actions that people take in reference to both settings and their signs. The