

The Moment in Hypertext: A Brief Lexicon of Time

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ABSTRACT

Hypertext literature has been characterized as spatial construct by many of the critics involved with its aesthetics and poetics. Michael Joyce, Cathy Marshall, Mark Bernstein, Carolyn Guyer, George Landow, Stuart Moulthrop and many others have explored the way in which metaphors of visual space can inform hypertexts--impacting both meaning and process. Although these writers refer to the time/space continuum, their writing has been less concerned with temporal constructs--how time might influence the programming, writing, and reading of hypertext literature. Time factors, however, could be viewed as important elements in the way hypertexts are conceived and received. This paper seeks to raise questions about issues of time--and to suggest some possible categories that might be investigated. Significant "information" is coded into everything from the equipment-determined limitations of "Machine Time" to the author-controlled clues embedded in "Mythic Time." To the extent that we make mental scripts of spatial parameters, readers and writers of hypertext fiction may build into the space of the cyberworld a complementary universe fully as rich in temporal experience. In both the Interface Experience and the Cognitive Structure, time is part of the inscription of coherent meaning for cyber-narratives and electronic poetry.

KEYWORDS: : Time frames, hypertext fiction, hypertext poetry, narrative structures, story parameters, spatial metaphor, temporal metaphor, interface, hypertext structure

INTRODUCTION

A body of critical work demonstrates that the nexus of time and space in hypertext narrative and poetry is problematic. Michael Joyce, Frank Shipman, Cathy Marshall, Mark Bernstein, Carolyn Guyer, George Landow, and Stuart Moulthrop, among others, have shown that hypertext structures manifest as spatial experience.

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In both technical and critical settings, the theories which explore the spatial basis for hypertext have helped writers understand and manipulate the medium. Frank Shipman and Cathy Marshall, drawing on a considerable body of research in traversal technology, and in their own demonstrations with space-placeholders, such as "VIKI: Spatial Hypertext"[1], have formalized these issues.[2] George Landow, in *Hypertext 2.0* revisits the primacy of spatial visualization as both controlling metaphor and conceptual precondition of hypertext writing. He identifies the first issue of linked writing as one of: "orientation information....necessary for finding one's place. The second concerns navigation information....the third concerns exit or departure information and the fourth arrival or entrance information {italics are the author's}." [3]

Spatial aspects appear to be so dominant, in fact, that some critics suggest that hypertext links may collapse time entirely, making all aspects spatial. John Tolva, in "Ut Pictura Hyperpoesis," says "In its simplest form, hypertext narrative evokes space by undermining chronological order and causal relationships. What dense allusion and repetition achieve in modernist poetics is technically emulated, indeed made more complex by, hypertext structures." [4]

The experience of a disruption or compression of time created by the spatial nature of links and nodes, however, may co-exist with a sensation of unending time. Janet Murray in *Hamlet on the Holodeck* makes a connection between the encyclopedic capacity of digital information and the immensity of landscaped space this infers: "Computers are the most capacious medium ever invented, promising infinite resources," she begins. (And from the context, we must assume infinite space, as well.) "We have extended human memory with digital media (an average book, which takes up about a megabyte of space in its fully formatted version) first to 65,000,000 words (a 650-megabyte CD-ROM, the equivalent of 650 books) and now to 530,000,000 words (a 5.3 gigabyte digital videodisc, equivalent to 5,300 books), and on upward." [5] If a print book can be a world, an electronic book is potentially the universe.

To counter the fear that we might be lost in such a boundless digital cosmos, we have concentrated on the

demarcation of appropriate storyspace. A related problem, however, might exist with time. If the space is endless, is not time potentially infinite, as well? And, if so, how do we indicate the storytime for the reader?

The extant electronic literature supports the assertion of spatial dominance in a number of ways. Spatial concepts are present in the controlling metaphors, in the reader/navigation systems, and in the arrangement of text. Stuart Moulthrop's *Victory Garden* [6] uses a city map that is also a labyrinth, Shelley Jackson, in *Patchwork Girl* [7] sites the body itself for the spatial field. Deena Larsen, in *Samplers* [8], invites readers to access storylines by clicking on squares of a quilt.

While the space elements of hypertext literature continue to be studied and transformed, new developments in the field--the use of a multiplicity of media forms (including video and music), the growth of the WWW, the presence of Java applets and scripts, and the advent of server push technology--have rendered the time elements more complex for programmers, writers, and readers of hypertext literature. As a hypertext writer, I began to realize that I had neither a vocabulary nor a conceptual framework with which to evaluate time elements of my fictional narratives or signal the presence of time to my readers. This shortfall led me to wonder if the hypertext community might look for ways to categorize these time elements, define their uses and effects. Since computerized hypertexts encourage us to "enter" a cyberworld that we perceive as having a spatial dimension that bears primarily a metaphorical relationship to the physical or "real" world, may not our conception of time, too, undergo transformation? Might we begin to look for a taxonomy of time?

Time can be construed in a number of ways. It can, first, be seen as a universal, homogenous concept. But it can also be analyzed in light of various possible properties--properties which might be identified, formulated, and manipulated.

Accordingly, this paper is intended not to answer questions, but to raise them. In our continuing project to explore and formulate hypertext theory, even preliminary queries may assist. Tentatively, I have identified six manifestations of time--categories that may describe our experience and understanding of hypertext fiction, contribute to the writing of texts, and suggest design features of authoring software. These categories are divided into two registers and named: Interface Time--Mechanical, Reading, and Interactive; and Cognitive Time--Real, Narrative, and Mythic. The terms are meant to be suggestive only--to open the way for further investigation which would integrate them with the work that has already been done by Michael Joyce, Jim Rosenberg, Robert Kendall, and others in this area.

INTERFACE TIME

Interface time can be defined as the physical span of time that the reader interacts with the text.

Mechanical

Mechanical time may be defined as the time occupied by

non-content computer processes such as booting, loading, transfer of data, downloading applications, and mouse command/response. While readers are not normally conscious of access time in print literature, electronic texts are always pursued in an environment subject to the vagaries of computer speed and software performance.

Readers are very conscious of the contrast between computer and codex. Recent anecdotal evidence suggests that readers have varied reactions to such things such as data delay--but audiences tend to confirm that a ten-second pause is intrusive and a thirty-second delay may interrupt the reading process.

Writers and programmers can elect to ignore the results of machine time or take them into account in several ways. In some situations, the download time becomes a part of the experience, as when a large graphic file fills in as the text is read. Another method of dealing with machine lag is forewarning the reader. Information can be displayed about the structure of the piece; readers can be apprised of the size of the file; or the reader might be given options (such as thumbnail graphics which may be downloaded in full version). No matter how this information is conveyed, however, it becomes a part of the design scheme.

A particularly interesting solution can be found on the splash page: "Welcome to Stuart Moulthrop's Web Site--Enter Where You Will." [9] The page is marked by the simplicity of its design: it consists of a plain background, a title, and seven numbered options. Moreover, it is unusual in the fact that it does not announce the content of the options. Instead, the list of choices apprises the reader of the technology (and, by implication, the download time) of each entry gate. The reader can choose from a range starting with "Minimal"--text-only, no special effects; continuing on through "Meta Content Format"--requires HotSauce or equivalent MCF Plug-In; to "Web Site Five"--Netscape layers, Flash-2 movies, requires Netscape 4 and Shockwave Flash Plug-in.

This example suggests the effect that even "anticipated" machine time elements can have on hypertext design and highlights the challenge for creators of hypertext fiction and poetry. Issues of machine time as a function of technology level may persist more stubbornly in off-line environments. For example, some hypertext works are designed to be read from the CD-ROM drive. While the industry standard CD-ROM speed is 24x, the range of CD-ROM speeds in public use ranges anywhere from 1x to 24x. The creator of a CD-ROM work has little control over the time lapse between screens--and has fewer design options for mediating among the differences in speed. Even with moderate-sized graphic or sound files, some users will experience uncomfortable delay and experience unintended interruption.

As a pragmatic strategy, writers and programmers can seek to minimize the effects of machine time for readers. Programmers can develop meta-structures that signal readers, in a non-intrusive manner, about possible delays.

Hypertext writers in off-line media can tailor their pieces to minimal software and hardware standards. Web page designers may make small files, avoid complex programming sequences, shun large graphics, video, or music. Or writers may frame their own work with technical-information membranes. Regardless, time considerations in hypertext writing dictate not only the structure of the medium, but the aesthetics, too. The means one has to create a message shapes the message. Our machine experience is gauged in seconds, our expectation of reading time can be nearly infinite. And we haven't even started the story....

Reading

Reading time refers to the duration of time the individual is physically and mentally engaged with the text--that is, reading a lexia, looking at graphics, listening to music. Michael Joyce speculates on this element of time in *Of Two Minds: Hypertext Pedagogy and Poetics*: "Interaction replaces (reinscribes) time and history within lived human experience." [10] And, in "Nonce Upon Some Times: Rereading Hypertext Fiction," [11] he explains the convoluted processes involved in reading hypertext fiction. In "implicating the reader in writing", a hypertext invites rereading, replacement, reconfirmation, review, and renewal. Because of the unlikelihood of encountering the same lexia of text twice, Joyce suggests, the reader adopts the writer's habit of rereading. Recently a student, about to embark on Michael Joyce's *Twilight, A Symphony*, [12] asked me how long it would take her to read the novel. Luckily, I had Jane Yellowlees Douglas' answer close at hand: stop when you have a "plausible version" [13] of the story.

"Oh," the student said, "it could take months, then?" Months, years, maybe forever.

In practice, readers may select a quite different level of engagement. Califia [14], a hypermedia fiction, contains 350 pages of printed text spanning 700 screens. Yet, a reader may spend a couple of hours with it and have a sense of the story. Reading time is a difficult thing to determine, and would benefit from further research.

Interactive

Interactive time can be identified as the time the reader is engaged in a meaningful exchange with the text. Into this category would fall any action on the reader's part to actively access any element of the hypertext itself. The act of choice is, in itself, a construction of time, punctuated by the doing. In his essay "The Structure of Hypertext Activity" [15], Jim Rosenberg defines the single, interactive move as an "acteme"--"executing an operation." Actemes include: following a link, operating an intermediate device showing information, clicking on an overview, backtracking, invoking simultaneities through mouse movement, rearranging layers. Later in the essay, he addresses links that are "created by the reader." He lists activities such as selecting text to serve as an anchor, telling the machine to make a reader-created link, navigating in the

target lexia, naming the link, and so forth.

Rosenberg envisions a "light weight" interface, one where the "symmetry" between the "reader's acteme and the gatherer's acteme" is created. He warns against the intrusion of actemes that might "break the spell" of the reader's involvement with the content. Rosenberg's own work, *Intergrams* [16], illustrates such a harmony. The flow of text in time across the screen is the result of continuous, but almost instinctive, action of the mouse. Rosenberg's work is part of the growing body of "kinetic text", where the movement of words on the screen in one sense defines, and in another merges, issues of Reading Time and Real Time (see below).

More problematic, perhaps, is where to place another kind of "activity"--active waiting (Robert Kendall calls this the "rhythm of anticipation"). [17] Again, Stuart Moulthrop's work provides an interesting model. *Hegiroscope* [18] uses server push technology. The nodes of the poem appear on the screen with an author-defined rhythm. Readers can elect to link to another lexia from the hotwords flanking the text, or they can enter the symphony of the default

Brenda Laurel, in *Computers as Theater*, [19] suggests that the percentage of reader interaction in a piece is not as important as the significance of the action. Further investigation of the nature of interface time may give us more insight into the optimal combination of machine time, reading time, and interactive time. In any case, these Interface modes all involve physical time. They coexist in hyperfiction, however, with the construction of another kind of time--imaginary--created by the content.

COGNITIVE TIME

Cognitive time might be defined as the span of chronological time that the reader constructs or reconstructs, imaginatively, to encompass the content of the poem or narrative.

Critics of print narratives have traditionally referred to the "temporal" aspects of as the flow of the text itself. In tracing the theory of the temporal/spatial in literature, Murray Krieger [20] and others have distinguished this time aspect from the "still movement" of spatial form. Hypertext time does not fit comfortably into these categories. Assuming that the interruption of discourse occasioned by hypertext lexia ruptures traditional text flow, hypertext time would need to be reconstituted within the newly-created space.

In order to assist in the examination of Cognitive Time, I would like to refer to a print text that illustrates one way time frames are constructed in narratives, Joseph Conrad's *Heart of Darkness*. [21] This novel tells the story of Marlow, the captain of a small river boat, who journeys up the Congo river in search of the renegade and elusive Kurtz. The narrative is structured in nested time layers which can be identified. The outermost, contemporary frame narrator is unnamed, perhaps associated with the author. He begins the story on board a yawl, the *Nellie*, that is cruising on the

Thames River. While he and his companions are waiting for the tide to change, one of them, Marlow, begins to speak. Marlow tells of his adventures some ten years earlier on the Congo River--and the bulk of the text is consumed with this episode. But Marlow embeds his account in another time span, the historic chronology of imperialism. From time to time, the unnamed frame narrator breaks in, reminding the reader of the passage of time on the Nellie, the progress of the tide. The text has three distinct time frames, real time, narrative time, and mythic time.

Using the time frames of this print text as a basis, we might be able to examine the way time is reconstituted in electronic narrative and poetry.

Real

Real Time might be defined as the "current resolution" of the narrative act (film critics sometimes refer to it as "screen time"[22]). It is, in that sense, non-reversible in the normal reading of a story. In *Heart of Darkness*, the Real Time would be the duration of the unnamed narrator's sail on the cruising yawl, Nellie--approximately the hours of the tidal change. In Conrad's novel, we can distinguish Real Time from backstory, or Narrative Time (that is, the Congo adventure as related by Marlow). In other print texts, the boundary of the Real Time can be more difficult to differentiate--but establishing this boundary is always a necessity for the writer. It is the filter through which other time elements are represented.

In electronic literature, Real Time can be signaled in many new ways, and it often acquires a new complexity. It can be enmeshed with the experience of interactive time. Robert Kendall's, *A Life Set for Two* [23], not only allows the reader to choose the pacing of intervals of the text on the screen, it also establishes a non-reversible relationship between the reader and the discovery of story. The poem explores the dissolution of a relationship and the painful aftermath. Depending on the choices the reader makes, the sequence of events will vary. However, Kendall means to establish a "real time" superimposition on the story by constraining access to the text. He eliminates the backtrack features, and, should a node be revisited, the text will have changed. He explains: "I also believe that retracing one's steps back through the work would undermine one's sense of it as an unrepeatable real-time experience." [24]

When I was working on the construction of *Califia* [13], my interactive novel, I struggled with a similar issue of time identification and delineation. *Califia* is historical fiction, tracing five generations of Californians on a quest for the lost paradise. Although the narrative backstory begins in 1848, the subjective events of the past come to focus in the "current resolution" of the story--a year in the 1990's, beginning one August and ending the following July. This time period brings the three narrators together; they take four journeys, and they resolve the mysteries of the past. But almost immediately I came upon the writer's experience of the "versioning" problem.[25] Rather than risk confusing

the reader with conflicting versions of the chain of contemporary events, I divided up the time responsibilities. Augusta, always associated with the linear, the passage of the sun, is assigned the task of telling the Real Time sequence. A reader who follows the default path of Augusta's links will encounter the chronological events of the year-long Real Time story. To the remaining narrators, Kaye and Calvin, then, fell the duties of Narrative Time and Mythic Time.

Dramatic Representation and Summary Representation. Regardless of the time frame being evoked, there are basically two ways to represent events in text. One might be called Dramatic Representation, characterized by moment-to-moment dialogue or action. Dramatic Representation overlaps, to some extent, and in some works, with Interface Time. In both Kendall's and Moulthrop's use of interactive reader/time strategies, the reader participates in altering the author's Real Time of the story. This overlap interrogates the issue of where the Narrator actually resides at the "time" of the reading. Is the Narrator the writer/programmer who has completed a "text" (albeit interactive) at home and has done with it, or is the Narrator an invented presence that mediates the reading experience as a Real Time interaction (albeit absent)? Christy Sheffield Sanford's "No Pink" [26] introduces an "I" narrator who leads us through action which is both Interactive and Real Time (Dramatic Representation) in nature. The reader "follows" the narrator to a visit home, a night club, a funeral. And, in each of these episodes, the reader can manipulate the flow of time by choosing frames, accessing moving text, and so forth. Here, the Interface creator merges with the Real Time narrator.

The other, Summary Representation, is a compression of time. It eliminates the particularization of action and dialogue, summing up what might have been dramatic, instead, in descriptive prose. Summary Representation may be the most difficult to establish and sustain in a hypertext story. In places where Summary Representation makes a bridge between two lexia of text, or forms a transition, its use is clear and expected. (In text, we are familiar with the convention that announces "every day that summer we went swimming.") However, when a block of Summary Representation exists in a lexia or screen alone, the placement of the time and the narrative source for it may be unclear. Bill Bly's *We Descend* [27] poses a complex time arrangement: it is a novel of the distant future that attempts to tell a story of its own recent past. However, the distant future resembles our own, and the "futurepast" bears some resemblance to our Dark Ages. Bly mitigates the time warp using the features of Storyspace to provide "notes" which pop up in separate windows to orient the reader to gaps in time that must be acknowledged. In a sense, it is Summary Representation is difficult to integrate into the hypertext environment without a strong matrix of Narrative Time and Mythic Time.

Narrative

If Real Time embodies the simulated "current resolution" of the narrative mechanism, Narrative Time is the means for revealing the precipitous causes--the conditions and events which gave rise to plot and action. In many cases the Narrative Time is concerned with backstory, or flashback, although in some cases the actual chronological location of the information is ambiguous. In *Heart of Darkness*, for example, Marlow's entire account of the trip up the Congo River is told in Narrative Time. If we know the approximate dates of Conrad's own journey in the Congo, the date of publication of the novel, we know Marlow's narrative occurred ten years previous, but if we do not, his story floats "sometime in the recent past."

Reconstructing Narrative Time is one of the chief tasks of the reader of Michael Joyce's *Afternoon, A Story*. [11] *Afternoon* depends for much of its effect on the suppression of time information. In this case, the absence of temporal parameters is a meaningful feature of the storyline. We identify the Real Time, unnamed narrator in the opening line. But almost immediately, we link back to random periods during the day. It is only as we order our own version of the fragmented scenes which form the sequence of the day, that we begin to see the relationship of these events in time, and, consequently, in meaning. That is, it is precisely the reassembling of the cause and effect sequence of the day which begins to yield the truth of the story. We encounter these fragments in space, but we reconstruct them in time.

My experience with *Califia* suggests that Narrative Time is the frame in which readers most frequently find themselves "lost." When a reader moves from one episode to another which involves a leap in Narrative Time, he has (because of the aforementioned difficulty of summary presentation) to reconstruct the time frame from available clues. Unless the text forms a continuous thread from lexia to lexia, screen to screen, the author, must either re-establish the time frame after each jump, or risk leaving the reader confused. For example, Calvin is the narrator in the novel who provides us with the "docudramas"--flashback sequences that capture important events from years past. If the reader chooses, for example, the link entitled "The City Builders", she experiences a jump in time from the Real Time present back to 1900. I wanted the reader to be immediately oriented, at that point, to the historic time of the Los Angeles water and land boom. One way of doing this was to signal specific time periods with screen transitions and the introduction of recurring graphics--the city builders on the Mount Lowe skyway, the arrival of the Owens River water--that appear elsewhere in a similar context. Another way was to use blue-toned photographs, bright, optimistic colors, and appropriate music clips. A final addition was the presence of "Event Maps", a button-click away, that characterize and identify each of the important backstory events. Even so, as there is no way of knowing exactly how the reader arrived at "The City Builders", a carefully frontloaded set of Narrative Time clues can fail, stranding the reader in cybertime. Because the story is fragmented by

the very nature of hypertextual structure and links, my intent was not to further disconnect the events, but rather to re-unify them in another context, using the features of media and interaction. In Narrative Time, the tools to reconstruct time allow the reader to create a time-sensitive space.

Mythic

Mythic Time refers to the parameters of the significant historical, pre-historic or post-historic, or ahistorical chronology. In *Heart of Darkness*, Marlow makes specific mention of the Roman invasion of Britain. Marlow says: "I was thinking of very old times, when the Romans first came here, nineteen hundred years ago--the other day...." [19] In establishing the "colonial conquest" as a context of the story, Conrad means us to know that the events in the Congo have an important relationship to the historic drive for empire--and the reader is encouraged to bring this knowledge to the reading experience.

Mythic time has been a parameter-creating device of oral narratives and print stories from the outset, although it may be invisible to the casual listener or reader. The most familiar example is "Once upon a time." These words, while seeming to diffuse the question of time, actually evoke a traditional "historic/ahistoric" concept. [28] The audience knows that the story took place a long time ago, and in another sense is timeless. However, the reader also knows that the story did not take place at the beginning of time (pre-historic) or the signal would be "In the beginning." In the same way, textual clues alert the reader to stories which take place in the future, and may begin with a code such as "Many years ago, before the explosion of the bomb..." or some such indication.

In the same way, however, that hypertext writers find it helpful to give readers an indication of space as early as possible in the reading experience (to limit the infinite cyberworld)--so hypertext authors often establish Mythic Time immediately, long before this information reveals itself in the text. While the author may only imply Mythic Time, readers readily construct time boundaries (important to our story/not our story) from indications such as design, color, graphics, music, and structure

In the case of some hypertexts, in fact, the metaphor used to indicate the "space" may also signal the Mythic Time. Deena Larsen's *Samplers* [8] inscribes a time somewhat different from the contemporary stories that the quilt reveals. The quilt seems to suggest a mythic pioneer period, peculiarly Americana; a time of shared work and community values--and so is important background information--to be contrasted with the disjointed time of the present.

The "visual clues" which establish Mythic Time parameters can be profound. Adrienne Wortzel creates an imaginary future-world in "The Electronic Chronicles." [29] Before we have had a chance to determine that the story posits an organization--The Casaba Melon Institute"--that has

"discovered" the Chronicles of the distant past (our own era), we have already been apprised that the story takes place in "whirled history." On the splash screen of this piece, the narrator, muse Eleanor is introduced. She is a monochrome, modern face inserted into a richly-colored graphic of medieval worshippers. The effect of this composite is both ambiguous and specific at the same time. Throughout, the visual mix invokes both the future (alteration of plastic representation by digital technology) and a specific past (the flat, stylistic, iconic style of the late Middle Ages). The "mythic frame" of the Chronicles could be cyber-infinite, but isn't, quite. The time parameters of the story itself are bounded by the possibilities inherent in the graphic suggestion: the reader is encouraged to think in terms of her relationship to information as remote as the middle ages, but the narrative voice is positioned somewhere in the future.

Carolyn Guyer's *MotherMillennia* [30] is a fascinating example of the invocation of Mythic Time within the meta-structure of hypertext. *MotherMillennia* is a collaborative work in which both men and women recollect stories of their mothers. The Real Time can be said to be the duration of the collaboration--Guyer's "collection" of the material; the Narrative Time is the body of reminiscences, each set in its own frame of life spans and generations. The graphic treatment, the theme of the gathered stories, and the title itself, however, place the work in Mythic Time--a millennial context--the existence of motherhood itself.

Mythic Time was very important to the time layering in *Califia*. The mythic sources for the story include the divination of the stars, the legends of the California Indians, and the dream of the island of Terrestrial Paradise. Kaye, the Mythic Time narrator, introduces these elements in a straightforward way on her path. But I also wanted the entire novel to reflect and articulate the mythic roots. I incorporated each of the mythic sources into the navigational structure of the novel. Readers can navigate by means of a Solar Chart (the dream of islands), by means of the stars of the Big Dipper (the star lore), or with a Kit Bag (dead reckoning, traveling light, the Indians). In addition, seasonal and cosmic elements determine the structure: the Real Time duration is four seasons, the journeys are to the four compass points, the Narrative Time events are related to the elements of earth, fire, water, and wind. In this way, should a reader miss the text of Kaye's *Legends* altogether, he might still "read" the Mythic Time of the story. Message here, must be carried not in the text, but in the context.

CONCLUSION: TIME FLIES LIKE AN ARROW

It may be that time, rather than undergoing erasure as a consequence of the dominance of spatial/visual mode, is reconstituted in the space of the hypertext in unexpected ways. The tendency we feel to "infuse" interactive elements into the hypertext experience: Java applets and scripts, unrecoverable screens, CGI scripts, animated .gifs, server push, rollovers, and moving text are means of "reinscribing" time a multi-linear, multimedia environment. Other possibilities might include a "progress gauge" such as

Kendall includes in "A Life Set for Two." While this feature doesn't correspond directly to reading time, it indicates the nodes a reader has visited, and thus "places" her in reading time. "Timed release" menus and links are another option--(the changing link colors on the web are one method)--these allow the reader to see new options and could be extended to spatial maps, as well. Future hypertexts might attempt to give the reader more control over the time elements of the experience, both interactive and cognitive. And, the temporal awareness of the work itself is a measure of our level of concern for the quality of the reader's experience. The reader's reconstruction of time through the assembling and gathering of text and media is what makes each reading unique. [17] Future hypertexts might attempt to give the reader more control over the time elements of the experience, both interactive and cognitive. And, the temporal awareness of the work itself is a measure of our level of concern for the quality of the reader's experience. The reader's reconstruction of time through the assembling and gathering of text and media is what makes each reading unique.

Absent the effort on the part of the programmers and authors identify specific time elements, the reader may feel that time pullulates uncomfortably--shrinking down to the impatience of seconds for mouse-response, or, inversely, inflating to mythic, cosmic proportions amid the unfolding of universe upon universe of imaginary temporal possibilities.

Spatial metaphor can be seen as one way of orienting the reader in hypermedia literature. And, if we agree on the necessity of the creation of space, perhaps exploration of time representation, and introduction of more time information will also enrich our experience of hypertext.

"His own face in the mirror, his own hands, surprised him on every occasion. Swift writes the emperor of Lilliput could discern the movement of a minute hand; Funes could continually make out the tranquil advances of corruption, of caries, of fatigue. He noted the progress of death, of moisture. He was the solitary and lucid spectator of a multiform world that was almost intolerably exact." [31]

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