

Hypertext *Avant La Lettre*

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The transition from analog to digital media is perhaps too readily understood as a shift from continuity to fragmentation, from narration to archeology. One might instead view it as a process of translation, since what is completely untranslatable into new media will disappear as fast as what is utterly translatable.¹ Such threats of disappearance tend to lead to symptomatic cultural formations.² The implications of digitalization for learning and pedagogy are the topic of numerous scholarly efforts; the most widely used hypertextual systems seemed to bear witness to the creation of a “new economy.” But while some saw the Internet conquering the world, others formed their neo-Luddite resistance.³ Their discontent concerned not so much the machine as its purported effects. Both positions pivot on the same unquestioned assumption: that something irreversibly, incontrovertibly new is intruding on the turf of textual production and reception.

Hypertext is the popular form of computer-mediated communication that has raised perhaps the highest expectations for a transformation of culture.⁴ It has been hailed as a new form of literature, a new encyclopedia, a universal library, and as a meta-medium that would ingest and replace all older media. Theodor Nelson proposed to consider hypertext a “generalized footnote,” and other media theorists like Jacob Nielsen, Norbert Bolz, and Friedrich Kittler have followed him in this respect.⁵ However, the footnote is still for the most part coextensive with the technology of the printing press, even as it expresses a certain strain against the linearity of narrative conventions.⁶ More than constituting an extension of annotation and gloss, hypertext draws on processes of subverting, inverting, and exploding the apparent linearity of the page, in self-referential ways modern literature had already exploited.⁷ At the same time, broader acceptance of hypertext in and as culture will only partly be achieved by way of improved technical concepts.⁸ Required, therefore, is an attentive reading both of the promises that throw historical caution to the winds of mass distraction, and of the quick assimilations that tend to reduce the complexity of any new situation to something already known. Thus if one were to maintain a truly innovative character of hypertext, a more promising model is actually the relational database.⁹ Indeed, new media art no longer presents itself as narrative, its forms have no beginning or end, no predetermined sequence. These and related observations about the symbolic form of computer-age fiction, cinema, games, art, and literature may or may not carry the full weight of the hype with which an absolute innovation was heralded; the point of the present argument will be to test, as a selective probe in the genealogy of media, whether claims of an absolute departure are justified. If the following paragraphs focus

mostly on hypertext, it is because the widespread aestheticization of digital forms of expression, distinguishing between hyper- and inter-media, separating fiction from interactive art, and so forth, in the end invariably fails to account for the fundamental question raised exemplarily by hypertext: namely, how to explain the anachronism of claiming precursors and forefathers while by the same token presenting a radical departure. It is a curious side-effect of positing such a paradigm shift that the logic of the break is applied to itself, and suddenly, with hindsight, it appears as if everyone knew it all along: as hypertext is hyped, much of what it supposedly superseded turns into hypertext *avant la lettre*.

To be sure, a text that would contain its own exhaustive index would already be nothing *but* its own index, and therefore the end of what it indexes: thus, the computer explodes the boundaries of the book. Hypertext makes relational references within the textual machine available, while their exact manner of connection remains open. The factors that affect and transform culture are less a matter of the media achievements that challenge the capacity of cultural memory than indeed of the conditions that question the functioning of memory as such.¹⁰ However, it is not enough to counter the promise of new media with the oldest critique on the books, that they scatter knowledge, undermine memory, and expose thinking to its deterioration. It is feasible to see hypermedia as little more than an improved means to an old end, as Thoreau said of the telegraph—but with hindsight, we know that technologies not only change the institutions of learning, they also transform the juridical and political milieu of culture.¹¹ To arrive at an appreciation of the relational database, one may look back at the development of the card index. Nevertheless, the point is not to historicize what goes beyond the book by pointing out that what first took shape as a bound sheaf recently has begun to fall apart again. Certainly in the sixteenth century, one knew to generate and copy excerpts and to summarize them in a register, but the loose pages were invariably threaded together, not handled individually.¹² For rhetorical memory it was imperative not to work with loose sheets; since such excerpts were to be re-read and committed to memory, it would imperil the entire project if their position in the collection were variable.¹³ The ability to sort and shift entries in varying correlations was long perceived not as a strength, a valued feature of knowledge management, but indeed as a dangerous weakness of the system.

At the end of the seventeenth century, a historical comparison of different techniques for excerpting and indexing led to the development of a “learned box” which would enable the relational manipulation of notes.¹⁴ This repository was soon adapted and adopted by writers, lawyers, historians, and philosophers: while John Locke had published the description of his card index in 1686 anonymously, by 1796 Jean Paul could publish a novel called *The Life of Quintus Fixlein, pulled from 15 card indexes*. Whatever occurred to Leibniz while reading or even on his walks, he scribbled onto slips for which he had a special cabinet constructed.¹⁵ The search for a page norm was easily settled: playing cards were in use for indexing at least since the French revolution. On May 15, 1791, the French government decreed that a list of confiscated books was needed to decide their fate: sell the libraries of noble families and monasteries, or make them accessible to the public. Local authorities resisted the scheme, since they had good reason to fear that after a book index went to Paris, the books themselves would not be far behind. Thus the National Assembly recommended quick new ways of indexing. Instructions were issued to inexperienced aides who would take stock where the intractable librarians seemed to procrastinate. Regardless of local library customs, they were to go and copy each book’s publishing information on a numbered playing card. These cards would later be more easily handled and sorted than a number of incongruent lists from the 83 departments; sure enough, the operation netted the commission 1.2 million cards, to be used for a national library.¹⁶ As contemporaries of Hegel describe in detail, he systematically hoarded ideas and excerpts on note cards, and carried them with himself from school days, when he started at age 15, to his death.¹⁷ Gerhart Hauptmann “wrote his nocturnal ideas on the wallpaper near his bed,” then cut it up to paste it into his daily output.¹⁸ Raymond Carver taped citations and fragments on three-by-five cards to the wall beside his desk; Georges Perec, who had worked as an archivist in a

scientific laboratory, likewise yielded to the “temptation towards an individual bureaucracy” and developed a complex filing system, using his index cards for most of his literary publications.¹⁹

Despite this respectable lineage (itself reconstructed from excerpts of excerpts), the card index figures only as an anonymous, furtive factor in text generation, acknowledged—all the way into the 20th century—merely as a memory crutch.²⁰ Since the enlightened scholar is expected not just to reproduce knowledge but to produce innovative thought (figured not just as a recombination of good quotations but opening new arguments and lines of investigation), knowledge management became and remained a private matter.²¹ But then as now, the question remains whether there is indeed a departure from the “neolithic mind” Claude Lévi-Strauss glosses over in an interview, when he admits that his own memory “is a self-destructive thief” counter-balanced only by his extensive use of a card index:

I get by when I work by accumulating notes—a bit about everything, ideas captured on the fly, summaries of what I have read, references, quotations . . . And when I want to start a project, I pull a packet of notes out of their pigeonhole and deal them out like a deck of cards. This kind of operation, where chance plays a role, helps me revive my failing memory.²²

In his subversion of the rigorous constraints of memorial order by dint of chance and play, Lévi-Strauss seems to allow that the notes may either restore memory—or else restore the possibility of contingency which gives thinking a chance under the conditions of modernity. That hypertext may instantiate such an epistemology of chance and play on-screen is therefore no innovation; the encoding and deciphering practices of computer-linked textuality merely recapture what had been possible already with the relatively primitive means of note cards—or playing cards. Hence the temptation to claim them for hypertextual ancestry.

Suggesting encyclopedic fulfillment and yet accessible only in constant dispersion, it has been suggested that hypertext has the potential to radicalize literary production. Writing was never simply a means of data storage; as it inscribes and erases traces of textual work, of memory and anticipation, it seemed as if literalizing this structure as hypertext could approach the most exalted hopes of literature. The bulk of critical commentary tends to focus on the question of hypertext-reception, but insight into textual production complicates a careful archeology of the self-reflective poetics of literature written under the conditions of the personal computer. Just as early cinema lagged behind the aesthetic possibilities of theater when it imitated its devices, hyper-fiction tends to lag behind the poetics of pre-screen literature. As with many technological innovations, at first hypertext appeared to spell the end of the book, the end of literature, the end of the humanistic constraints of perception. But instead of an immense extension of aesthetics, as media optimists envisioned, computing technologies soon turned out to have an *anesthetic* effect, threatening to turn the user of a tool into a mere consumer of anachronisms. Despite the widespread digitalization of all media, most attempts to put computers to literary use restrict themselves to hypertext, and the result more often than not falls back behind modern prose. To be sure, hypertext can pose significant challenges to the conventions of canon, author, reader, and text. That does not prevent philologists from using hypertext for their analyses.²³ Even the most skeptical media critics demonstrate increasing technical competence.²⁴ On the other hand, numerous cultural commentators who seek to establish the renewed relevance of their particular intellectual lineage claim prescience when it comes to this knowledge system and interface. Vilém Flusser called Champollion a computer *avant la lettre*, since he cracked the hieroglyphic code.²⁵ Friedrich Kittler considers Hegel’s notebooks “hypertextual” and Babbage a “precursor of the computer,” and with Lacan, he identifies the “first machine” based on empty placeholders as Pascal’s invention of the arithmetic triangle in the year 1654.²⁶ Lacan called cybernetics and psychoanalysis parallel instances of the same thought experiment.²⁷ With hindsight, everybody knew all along. Recollection becomes oblivion, the interface-principle WYSIWYG becomes WYSIWYF: what you see is what you (for)get. Such

parapraxis slips into the discussion of hypertext and the Internet wherever you look. One might say that the symptom of new media studies is this screen memory. As long as we remain blind to the texture of this symptom, we seem to get over it simply enough, beheading hypertext and arriving at psycho-biographic significance: hypertext will have been nothing but the metalanguage which never presents itself and remains folded in.²⁸ In the age of digital modification and insufficient version control, the screen is the horizon of memory.²⁹ Context hides directly beneath the surface, always a click away; there is no world before the machine.

By far the most enthusiastic reception of hypertext in all its dimensions was extended by cultural theorists: at long last, all the promises of their approaches seemed to have come into their own, be they hybridity, nomadism, polyphony, intertextuality, or discourse analysis. Hypertext was going to prove Foucault, Iser, Barthes or Deleuze right.³⁰ Whether the attention paid to hypertext is seen as confirmation of rhizomatics, actualization of semiotic theory, or a return with a vengeance of reception aesthetics, all of these modes fail to recognize a basic and pivotal fact about the precarious status of hypertext: programs can be called writing, but in order to run, in order for text to be displayed properly, to be distributed and received, they need to be translated into other codes. Despite the obvious misgivings that a grand narrative of textual and theoretical innovation might smuggle traditional hermeneutics back in through the back door of technological determinism, it has been claimed as belated support for a certain poststructuralist and semiotic claims. George Landow was among the first academics to claim a “convergence” of hypertext and the theoretical micrologies of the last three decades.³¹ He identified the key feature of hypertext as the link, and presented it as a kind of parodic hypertrophy of the footnote. Landow’s identification of Derrida’s writing as hypertextual *avant la lettre* itself exhibits this sort of drift, if we follow the notes: Landow cites Ulmer, who refers to an interview with Derrida regarding one passage from Derrida’s *Glas*, in which citations from the French *Littré* dictionary are listed . . . Across the Atlantic, Norbert Bolz agreed—calling both Wittgenstein’s *Philosophical Investigations* and Derrida’s *Glas* hypertext *avant la lettre*.³² I have written about this tendency to avoid reading *Glas* elsewhere; mention of Wittgenstein invites scrutiny of another aspect of such contagious retrospective anachronism. His papers, dispersed between Britain, Norway, Austria, and elsewhere, presented the executors of his estate with a conundrum when they found a box labeled ZETTEL, containing numerous loose pages and fragments. Anscombe and von Wright numbered no fewer than 717 such “scraps,” the earliest dating from 1929, the latest from 1948 (the bulk was dictated between 1945 and 1948). Were they excess material, occasional ideas, sources and excerpts? Should the typescripts and hand-written notes be published, destroyed, classified—and according to which criteria? A closer look demonstrated that they constituted a card index, and offered clues on the ways in which Wittgenstein’s writing relied on fine-tuning and copying; version control after his death proved to be an extremely difficult, but on rare occasions very informative task. Though far from presuming to reconstruct what Wittgenstein had “meant” to say in unfinished works, the editors simply ordered and published what they deemed the significant finds from this card catalog. Throughout, Wittgenstein’s practice of cut-and-paste was integral to his writing method to an extent that puts the avant-garde claims of hyperfiction to shame: “Usually he continued to work with the typescripts. A method which he often used was to cut up the typed text into fragments (‘Zettel’) and to rearrange the order of the remarks.”³³ As von Wright reports of the Wittgenstein papers, some cuts of longer texts are still extant, others were destroyed, and yet other fragments never made it into print. A typescript of 768 pages (called simply *The Big Typescript*) was dated to 1933, and it had been in the estate’s control since 1951, but only in 1967 did they discover the “Zettel” from which it was made. Despite extensive cut-and-paste, the end-product was always a linear argument, not a multi-dimensional arrangement.

Above all other unwitting forefathers, Landow and other adopters of the convergence hypothesis claim that Roland Barthes anticipated hypertext.³⁴ Be it Proust, the daily newspaper, or the television screen—to Barthes, it was all text, and in the age of the Internet, it was going to be Barthes who had

always already anticipated its structures and strictures. Admittedly Barthes' writing lends itself to such pretexts, because he often read in a manner that generated, despite all categorical, classificatory zest, a kind of constant *déjà vu* effect.³⁵ In *S/Z*, Roland Barthes goes so far as to claim that, faced with the impure communication or "intentional cacophony" that is literature, one must accept "the freedom of reading the text as if it had already been read"—and he goes further in asserting that faced with the plural text, there is no such thing as forgetting its meaning. Indeed Barthes believes that one truly reads only in such quasi-forgetting.³⁶ Reading would be a certain kind of constructively modified forgetting; inversely, it might mean that one only ever reads as if one had already read. Here, click theorists and critics of digitextuality find themselves in agreement with the impresario of the *Desktop Theatre of Amnesia*.³⁷ Interestingly, reading Barthes is to experience *déjà lu*, too: the distinctions Barthes made in 1960 between writerly and readerly texts return in 1968, and his semiological definition of text crops up in his arguments from 1963 through 1976. "Though most of Barthes' now 'canonical' formulations on textuality occur in the period from 1968 to 1975, the issues that pushed him toward it were organizing his writing much earlier," observed John Mowitt, "in essence adumbrating the move that directed his attention to the work's status."³⁸ Mowitt notices how 'articulation', Barthes' term in "The Structuralist Activity" of 1963, "reappears eight years later in the Preface to *Sade/Fourier/Loyola*"—and such continuities abound:

Though I might be accused of stretching the point, it is also worth noting that in order to exemplify the procedural category of "dissection" (articulation's twin) Barthes has recourse in this essay to the sonoric distinction between s and z—precisely the distinction that Barthes later exploited in his most ambitious demonstration of how one might read "textually," namely, *S/Z*.³⁹

Faced with such textual echo, Mowitt concludes "it becomes difficult to dismiss this tangle of associations as merely fortuitous." The reason became evident to the public when the *Centre Pompidou* opened an exhibition on Barthes' work: he had worked, daily throughout his intellectual life, with an extensive card index. In an interview, Barthes described his method:

I'm content to read the text in question, in a rather fetishistic way writing down certain passages, moments, even words which have the power to move me. As I go along, I use my cards to write down quotations, or ideas which come to me, and they do, curiously, already in the rhythm of a sentence, so that from that moment on, things are already taking on an existence as writing.⁴⁰

From 1942 to his death, Barthes amassed 12,250 note cards, constantly rewritten and re-ordered. He had given an outline of this intellectual tool in an interview, but it was only upon opening his papers to the manuscript researchers of IMEC that the scope of his card index could be studied. "There is a kind of censorship," Barthes said, "which considers this topic taboo, under the pretext that it would be futile for a writer to talk about his writing, his daily schedule, or his desk."⁴¹ Almost all of these cards, a quarter of letter-size paper, were written in pencil or blue ink; sometimes words or phrases are (partially) crossed out or corrected. Barthes marked a group of cards simply by noting the category on an upright card, and the rectangular cards that followed it would contain quotes, observations, or diagrams. In the left or right top corner, he sometimes noted the date, and often the page numbers of his publications where he used the information contained on the card (e.g., a fiche on "acting out" refers to *S/Z* pages 71–72). Several of the cards exhibited showed more than one use—including the passages noted by Mowitt.⁴² There are no obvious techniques Barthes used to refer from one card to another beyond underlining, or sometimes circling, a word, term, or topic taken up on another card (some cards list up to three such links). For Barthes, outing his card catalog as co-author of his texts was "an anti-mythological action," as he said: "it contributes

to the overturning of that old myth which continues to present language as an instant of thought, inwardness, passion, or whatever.” As one of the editors of the exhibition catalog concluded, Barthes’ *fiches* were not the carcass of an unfinished project—there are no missing works by Roland Barthes, despite his sudden death in 1980.⁴³ “I know that everything I read will somehow find its inevitable way into my work,” he had said confidently. The last course Barthes taught, however, was called *La préparation du roman*, preparing the novel. Spread over two years, it simulates the exercises leading up to a novel; a week after the last class, Barthes was run over by a bus. On the one hand, his death may have prevented him from actually writing his novel—on the other hand, the entire course, now published as a notebook, marks the novel as a lost object from the start. These notes are quite condensed and fragmented, just as the short sections of his *Lover’s Discourse* were; Barthes had planned to include a postscript to that book, discussing his card index and method of writing. But that plan was abandoned, and the postscript was found only later among his papers.⁴⁴ All of Barthes’ papers are now available at IMEC; the one thing that can be learned from the manuscripts is his tendency to pare, to erase and efface certain words, especially pronouns, pruning his writing of autobiographical and self-referential elements while retaining a novelistic propensity.⁴⁵ However, we must not confound the exposition of text design with what makes up the core of the card database: the so-called content.

If Landow’s convergence hypothesis is to be tested in its reliance on Barthes as a model, the question is to what extent the card index, not the footnote, constitutes the precursor and technical model for hypertext in general and hyperfiction in particular.⁴⁶ Admittedly, some experimental story-tellers mimicked the gloss of Talmudic annotation; Queneau and Calvino made their mark with the quasi-formalist poetics of Oulipo; and some novelists and even a few poets intersperse their texts with the occasional footnote. Yet while annotation remains crucial for the documentation of philological or bibliographical accuracy, or for the demonstration of philosophical or pedantic veracity, it is only rarely a poetic model. There is, however, a poetics of erudition and concealment around reading and writing, as long as there remains a vested interest in the appearance of originality or creativity, in preparing a novel or other literary form as well as in new media art. One need only think of Chris Marker’s *IMMEMORY* or Olia Lialina’s *Anna Karenina Goes to Paradise* for intelligent use of the database form; George Legrady’s art makes the structure even more obvious.⁴⁷ This poetics of intellectual capital was first embodied in the card index, and perhaps hypertext goes no further than to make it more explicit than before. Yet already in 1951, the Prussian writer Ernst von Salomon had published a novel that takes its shape as a questionnaire; to read it is to construe it as text-generator in following commands to jump recursively from questions to answers and page to page.⁴⁸

It was Walter Benjamin who announced that “the card index marks the conquest of three-dimensional writing, and so presents an astonishing counterpoint to the three-dimensionality of script in its original form as rune or knot notation.”⁴⁹ Arguably, the true forefather of the web is not the footnote of yore, but the vision of the Belgian bibliographer Paul Otlet, whose fantastic project of a Universal Book was to manifest the connections each document has with all others, and to open this referential structure to further annotation and restructuring by each user. Since 1895, Otlet had envisioned a master bibliography of the world’s libraries, but found one fatal flaw all systems shared: they stopped at book titles. Otlet wanted his system to penetrate that boundary, to link up the substance, sources and conclusions of all books. Long before Vannevar Bush or Ted Nelson laid claim to radicalizing knowledge management with memex or hypertext, Otlet developed a scholar’s workstation that was, in essence, a database using millions of index cards.⁵⁰ He imagined the *réseau* would eventually be accessible by telephone lines, retrieving facsimiles projected onto a flat screen. Today as in Otlet’s vision, hypertext foregrounds one feature: it tends to present itself as the sum of its links. However, the defining trait of hyperlinks is not just a web of self-annotation—they set in motion the three-dimensionality of letters that Benjamin saw mainly in the typographic innovations of advertising. It is important to note that under the efficiencies of

the networked computer, hyperlinks in effect may also result in a poetics of the relational database. With this realization, new perspectives have been opened for the presentation and production of meaning. Few commentators accept this, however, surmising, again with Benjamin, that the new media spell the end of narration. As the limits and combinations of the new machines were tried and applied, the conventions of time-space perception are challenged and transformed. Film still maintains an affinity to linear narration, it also marks a significant departure from its conventions, by dint of cut and montage, fast-forward and slow-motion. In a note for his storyteller essay, Benjamin articulated the fear that

Everything is repudiated: narration by television, the hero's words by the gramophone, the moral by the next statistics, the storyteller by what one knows about him. [...] *Tant mieux*. Don't cry. The nonsense of critical prognoses. Film instead of narration.⁵¹

Perhaps under the conditions of computerized society, the assumption that literature is the highest form of human language may seem obsolete. There is no Turing-test for literature.⁵² But before we hasten to the conclusion that the introduction of computers turns “even the most intelligent poetry into myth or anecdote,” as Kittler mocks, the fact remains that the new systems are used not only for the technical documentation of airplane construction and open-heart surgery, but also for the writing of poetry.⁵³ Of course historically (and systematically), the first electronic texts were computer programs, and without them there could be no hypertext. But there is also plenty of serious work on literary software. In 1962, the software “Auto-Beatnik” was introduced by R.M. Worthy in *Horizon Magazine*, “Auto-Poet” and “Scansion Machine” followed, and in 1984, the *Scientific American* reported on “Racter,” the first prose generator.⁵⁴ It uses a vocabulary database to generate complex, grammatically correct sentences. By now, numerous such programs are available on the Internet; among the best known are “Eliza,” imitating a psychiatric conversation, and sentence generators like “Prose.”⁵⁵ Many commercial websites now use customer service bots that interact with visitors handling standard queries and complaints. Search engines parse natural language to better determine the exact nature of your question. A program, it turns out, is just a text that generates text. With this development, the task of the critic seems impossible. How can the reader recognize an object as belonging to a class of objects, such as poetry, in such a way that it does not resemble the other members of that class too closely, as in plagiarism or direct imitation? One solution would be to distinguish between dissimulation and membership in the class. Twenty years ago, the literary critic Hugh Kenner collaborated in the development of a “travesty generator,” a software that would imitate literary texts. He concluded that all texts already followed his travesty principles, and language itself follows the rules of his software.⁵⁶ But impossible anteriority leads into paradox. One way to address the issue is to remind ourselves that not every text about literature is literature; not every text generated under the conditions of the machine is machine-generated text.

Of course computers have no need to distinguish between a poem, a portrait, a video file, or a chunk of Unix code—sounds, images, texts all disappear into binary states and are only simulated on screen. The readability of hyperfiction relies on HTML and its extensions like Javascript, on the server software and its integral and occasional components that make the Internet possible, and on the operating software the computers run. Thus in the final analysis, literature on the computer is simulated literature; strictly speaking, there is no hyperfiction, there is no net literature. But before this is seen as belated confirmation of the again and again greatly exaggerated news of literature's death, informed hypertext criticism requires competence both in the technologies of literary form and in the arsenals of code.⁵⁷ The true challenge of multi- or hyper-mediality and interactivity is that the integration of sound and image tends to distract from the fact that ultimately, they are all code—and integrated only to the extent they are compatible on that level. As for hyperlinks, they challenge policies covering citation and fair use only to the extent that they go beyond the confines

of a web or net of references internal to a text; rather than radicalize the poetic possibilities of creation, the whole tangle of questions is reduced to a matter of user interface design. What few commentators care to address is how the practice, for instance, of Proust, Joyce, or Arno Schmidt demonstrates the transition from an extensive card index to a complex textual montage. The next step would be to recognize which lessons their exploration of the frontiers of textual production may yield for writing and reading under the conditions of the computer. On either side of this equation, the technologies of data processing and poetics surely go back further than to Modernism. Nevertheless, it is against the yardstick of twentieth century writing that digitextuality is mostly measured.

One twentieth century German writer often claimed as forefather of hypertextual literature is Arno Schmidt.⁵⁸ Voraciously citing, inveterately punning, Schmidt distilled his card index in to literary texts, published as complex typescripts, photo-mechanically reproducing his montages without editing. Between 1963 and 1969, Schmidt worked on his 130,000 cards for up to 16 hours per day, producing a text of 1,130 pages, 13 by 17.5" large, and managed to publish it as *Zettel's Traum* (in a Shakespearean allusion, *Bottom's Dream*) in the following year. But he sought recognition not only as creative writer, but also as a theorist of linguistic and stylistic elements of modern prose. According to Schmidt, only diaries constitute a serious attempt at dealing with internal human processes—they help recollect, just as a photo album does, and Schmidt calculated the graphic dimensions of his textual arrangements so as to assist you in following certain associations and connections. Critics even speak of Schmidt's guidance "luring the reader into identification, into the *déjà vu* conviction that these recollections are his own."⁵⁹ Joining impulses from Joyce and Freud, among others, Schmidt documents how literature springs from less than divine sources. *Zettel's Traum* is an extended essay on E. A. Poe; over the course of 24 hours, the four protagonists discuss Poe's works, and Schmidt arranged his text in three parallel columns: the center column contains the action, the left one the Poe discussion, and the right column is made up of comments, footnotes, and auctorial opinions. Although much of *Zettel's Traum* is devoted to discussions of E. A. Poe, its title is an open Shakespearean allusion to Bottom's dream. Page (or card) 914 of this proto-hypertext contains the passage most critics view as the key to this gigantic structure.⁶⁰ Each of the four characters in this card index fiction is spaced out on Schmidt's pages in a collective score, and here, the book is allegorized as a quartet of voices—the voluptuous unconscious, the mean super-ego, the observant ego, and a fourth instance – something which, according to Schmidt, accrues to men in their fifties, when the sex drive wanes and gives way to what the detached, smiling alter ego of the author represents. Like Derrida's *Glas* or Joyce's *Finnegans Wake*, often claimed as proto-hypertexts that court unreadability, Schmidt's book earns its inclusion here not by virtue of any such purported or real difficulties, but simply because it dares declare itself made, not always already fully formed.⁶¹ Such unforgivable artifice stands in the way of naïve investments in make-believe, auctorial inspiration, or genius.⁶² Similar textures are also evident in Benjamin's *Passagenwerk*, in Butor's *Mobile*, or in Nabokov's *Pale Fire*, a self-declared novel that falls into four parts—a preface, a poem, a lengthy annotation, and an index focusing almost exclusively on the notes.⁶³ In the preface, Nabokov recommends that readers start with the annotations, then return to them after cursorily picking the poem apart; he even goes so far as to suggest taking the book apart in order to cut and paste pages together at will, or at least buying a second copy to read them side by side. The poem itself is said to be written on 80 index cards of 14 lines each, as the preface dryly describes.⁶⁴ Over the moon, Jules Verne's writing is equally illuminated by the reflective fire of a card index, since the source code for his science fiction output was a box of some 20,000 excerpts and notes on scientific journals and books.

The palimpsestic structure of such cosmic writing presents itself differently, again, in the 24 books of *A*, by Louis Zukovsky: "A / child learns on blank paper, / an old man rewrites palimpsest."⁶⁵ In this self-interpreting long poem, lines here gloss other lines there, allusions there become references here, and the whole successfully stages what many experimental hypertexts aspire to: a

fascinating textual machine that explodes the pages of a book and yet holds together aesthetically. Zukovsky's poetry implicitly uses both Wittgenstein and Benjamin, whom he had read carefully; but when he was working on *A*, as he records in *Bottom: On Shakespeare*, he had also acquired the habit of performing, for himself, Shakespearean texts.⁶⁶ As for Schmidt, Bottom is for Zukovsky the performative weaver, the character who wants to play all the parts out of a fear that the audience might take the play for reality. In their craft, both Schmidt and Zukovsky hone a Shakespearean attention to particulars, scraps, contingencies. But unlike Schmidt, who in his punning ways always sought out vernacular spellings and colloquial phrases, Zukovsky's writing is not an imitation of speech but written to be performed. If some of Schmidt's spellings disgorge their single and double entendres only when read out loud, Zukovsky's poetry has other ways of straining against typographic convention. Despite such partial confirmation of a convergence hypothesis, it is certainly not satisfying to offer Joyce or Schmidt, Zukovsky or Nabokov as advanced hyperfiction writers if by the same stroke their writing is rendered (virtually) illegible under the burden of theoretical proof. At the same time, it remains questionable whether even the most accomplished new media art could or should be measured against high modernism.

Finally, the hypothesis of convergence must be tested inversely: if hypertext instantiates what cultural theory knew all along, can a theorist's work be presented hypertextually? This has been tried with the silicon sociology of Niklas Luhmann's recombinant excerpts from an archive of excerpts.⁶⁷ His card index, Luhmann confessed, cost him more time than the writing of his numerous books: little surprise, then, that they demonstrate a certain amount of systematic redundancy.⁶⁸ Shortly after Luhmann's death in 1998, a dictionary and a glossary appeared to facilitate access to his thought, and an interactive database is offered on disk, marketed as "Luhmann on your computer." To be sure, nearly everything Luhmann read and wrote was part of his extensive card index, and his theory is incorporated in it perhaps more even than in his numerous books. The question, as in the case of Barthes, would be whether from the depths of such a memory bank, further texts could have been generated, or still can be. Users of the Luhmann CD-ROM may try their hand at emulating his arguments within the recursive parameters of his systems theory.⁶⁹ The assumption of such an introductory multi-media tool, even without Luhmann's examples or a decent full-text search function, is that the theory comes alive, lives on, in its card index. Exploring the referential complexities of observation and differentiation, of circularity, structure, method, contingency, of communication and autopoiesis, the user navigating the database is held to make distinctions of increasing complexity while exploring the concepts and questions along their converging paths and definitions. Luckily for the uninitiated, the CD-ROM offers more than just continuous jumps—at the bottom level, one finds an introductory essay on the historical development of Luhmann's systems theory, and most screens also display an alphabetical menu, thus firmly anchoring the hyper-theoretical drift in an encyclopedic project.

A different approach to associative indexing is explored in another collaborative database tool, developed by a Swiss team of programmers.⁷⁰ Called *nic-las* in homage to the great late sociologist ("knowledge integrating communication-based labeling and access system"), and billed as a "software prototype of an *autopoietic* knowledge landscape for social systems," it is basically a cooperative digital space for research groups, made up of textual components and java objects. Shielded and organized by a multi-user access portal, each team can decide to what extent their collaboration is visible also to outsiders, and to what extent their notes, citations, exchanges, and other documents are made available to search engines. Anonymous use is possible at least in principle, but experience has shown that the thirty or so research collaboratives currently using *nic-las* tend to express themselves in the idiosyncratic ways of a typical academic gathering, with concerns over attribution, credit, and accreditation still extant. New entries or modifications of existing entries are recognized and dynamically linked to relevant other notes in the system. An intriguing feature is that deleted elements end up, for a while, in a digital unconscious; they remain accessible to certain search operations, and can even return in unforeseen ways. The system distinguishes between a

Freudian and a Deleuzian unconscious; while the former pushes some deleted objects back onto the documentation surface, the latter generates a random selection of deleted and undeleted objects in the form of new virtual index cards. Whether this is seen as new media art or as a software tool for academic work, and more importantly whether or not this succeeds in inscribing theory in software or vice versa, is ultimately a matter of the user experience, not just of the user interface. Here, as in other single- or multi-user hypersystems, if the archive is intricately linked to the institution which authorizes it, then the law of selection, inclusion or exclusion would appear to be a dark outside. Although this law is itself implied in the archive, it decides what is represented, and what is not. Yet hypertext's champions still claim that it accomplishes a virtually universal memory as envisioned by its pioneers Bush and Nelson.⁷¹ Claiming to have foreseen in 1960 the development of personal computing, word-processing, hypermedia, and desktop publishing, Nelson protests that nobody had yet understood how this structure can organize every connection and use of information, beyond inclusion or exclusion; hence his neologism, transclusion.⁷² Transclusion would enable one to re-use information with its identity and context intact.⁷³ However, just what the identity of context would be is the question: arguably, such a limitless memory of "intertwingularity" would not be a memory at all, but infinite self-presence, while memory constantly revives the aposemiological corpse of the sign in referential paraphrases to recall its necessary relation with the non-present.⁷⁴ This "diadeictic" relationship presupposes, as Lyotard writes, "the empty gap, the depth separating shower and shown, and even if this gap is referred onto the table of what is shown, it will there be open to a possible index, in a distance which language can never signify without a remainder."⁷⁵ Hyperlinks alone do not allow one to surmount this obstacle. If every word were its own index, referring to something else—another word, another meaning—it does not follow that the word index, even when it appears in an index, is already that index.

That the exclusionary meaning of the word index, in the sense of an instrument of censorship, can never be excluded, even in the most efficient file management, is illustrated amply by the computer art installation *The File Room* (1994) by Antonio Muntadas, which indexes cases of governmentally suppressed speech from classical Greek drama to contemporary journalism.⁷⁶ It includes works censored throughout the history of art because of their sexual orientation content, and directly addresses freedom of speech; when the project opened in Chicago in May 1994, it contained 400 cases spanning 25 centuries, from Aristophanes to Salman Rushdie. Viewers could ponder Diego Rivera's dispute with the Rockefeller Center over his depiction of Lenin, or TV moderator Ed Sullivan's request to The Doors to change one line of their lyrics in "Light My Fire." The architectural refinement of the installation belies the immense amount of information compressed into its representation of censorship; in its dark chambers of bureaucratic compartmentalization, containing black file cabinets and low lamps, viewers browse case histories—or indeed add their own case to the archive.⁷⁷ Chicago high school students reported the confiscation of pamphlets about teen sexuality; entries were also made possible via the Internet. Hypertextual case management allowed the integration of images and other data from the Internet into *The File Room*—hundreds of users logged on daily and explored notorious or half-forgotten incursions into private or public lives. Thus *The File Room* earned its reputation as pioneering "net art."⁷⁸ But while such computer-mediated extension seems to explode the frame of the project, the installation remained site-specific in another sense: Muntadas had chosen the Cultural Center in Chicago because it had originally been built as a city library in 1897. Foregrounding the precarious and unfinished nature of archival processes, *The File Room* attempts a re-integration of the exclusions of the archive into the institution that has been shaped by censorship as much as by preservation. In the final analysis, *The File Room* can never be closed, its promise to render invisible images and make unreadable texts legible must remain in permanent deferral. By the same token, with the inclusion of formerly censored art and literature now widely available online, the specificity of Muntadas' hypertext project is in peril of paling into the grand nowhere of the Internet, an unremarked irony for an art installation which despite (or because) of the intentionally claustrophobic atmosphere of its physical setting sought

to transcend certain limitations of time and space. Muntadas' *The File Room* is clearly indebted to the conceptual works of the Art & Language collective, particularly to card index systems such as *Index 01* (1972), consisting of eight tall file cabinets of variable dimensions (appearing like columns topped with drawers) and photostats; *Index 2* (1972), consisting of a similar installation and surrounded by a wallpaper of index cards, plus file boxes on a table; and *Index 5* (1973), offering "Instructions for reading the index."⁷⁹ While net art may disregard the modernist ideal of the artist who originates or perfects a single skill or style, it still differs from conceptual art in that it often suffers a separation of interface and content; projects such as the *I/O/D Webstalker* (1997) strive to make that gap of digital representation the main theme.⁸⁰ Full comprehension of the influence new technologies have on literature and literary studies in particular, and on our culture and its self-representation in general, may seem to recede perpetually into the distance. But while popular views of distance remain cathected with forgetting and repression, distance is arguably nothing but the medium of appearing—as long as simultaneity equals noise, distortion, incomprehensibility, the delays and processing cycles of human or machine intelligence remain necessary. Information lies dormant until it is accessed through an interface; yet that same interface may be distorting the information, obscure its sources, and perhaps even its crucial processes. This kind of information hiding is at work in every machine, and in the recesses of the very code that carries hypertext; it is what database art tries to tease out and foreground.⁸¹

Since Hegel, writing and calculating machines are understood as a threat, because they interrupt and disperse the cultural fabric of sublation, recollection, idealization, and the history of spirit; the mechanical prevents any recuperation into complete and infinite self-presence. Neo-Luddites and technophiles share the assumption, enthusiastically or apocalyptically, that machines are omnivores, imploding all referentiality and excluding humans by means of their illegibility. Fredric Jameson worries that no society has ever been as oversaturated with information as ours.⁸² On the other hand, qualified net-critique beyond mere consumerism requires new competencies and access for all; one can learn Fortran, C++, Unix, and Java—and will still concede that most programming is a synthetic group effort, not a critical analysis. And it is somewhat anticlimactic for new media studies to beat a retreat to interface design if it means giving up the crucial access to what interfaces only cover over. At times, this retreat is even dressed up as progress, as in the demand that a filmmaker, for instance, "needs to become an interface designer," as Lev Manovich urges: "Only then will cinema truly become new media."⁸³ Surely the political, technological, or economic impulses of new media will have aimed higher than at generating mere screen memories for the bureaucratic entertainment of an interface culture.⁸⁴ In the end, preserving access beyond user interface design is a necessity, as the index card demonstrated many times over since the French revolution. While it is clear that computer programs and hypertexts by themselves will not revolutionize textual production or digestion, the archeology of multimedia reminds us that fiction and technology "converge" long before the age of the personal computer, when their convergence has turned into an ever more technologized fiction. To observe the issues at stake is to observe how literature and the human sciences observe themselves and each other. This mutual second-order observation of information hiding becomes legible only if you are able to access systems such as that which Barthes, as well as the collector Nabokov or the accountant Schmidt, the lawyer Luhmann or the philosopher Wittgenstein, all knew as a reliable tradition of archiving and handling the knowledge they would use as writers. Thus to study media is often if not always to study the political economy of an open secret.⁸⁵ Discussing the documentary system of police surveillance, Foucault points to a "partly official, partly secret hierarchy" in Paris that had been using a card index since 1833 to manage data on suspects and criminals. In a note, he dryly remarks:

Appearance of the card index and constitution of the human sciences: another invention the historians have celebrated little.⁸⁶

Notes

1. This text is a companion piece to Peter Krapp, *Déjà Vu: Aberrations of Cultural Memory* (Minneapolis: University of Minnesota Press, 2004). My argument here develops a line of investigation indicated, but not explored in chapter 6 of that book; it was presented and discussed at Brown University in 2003, and at the University of California, Irvine, in 2004. In its present shape, it repeats neither that presentation nor the argument in my book—but it was produced from the same computerized card index, so one may consider it a DJ Vu re-mix.
2. Nicholson Baker, “Discards”, in: *The Size of Thoughts and Other Lumber* (London: Picador, 1996), 125–181; Richard A. Lanham, *The Electronic Word* (Chicago: University of Chicago Press, 1993); Richard J. Finneran, ed. *The Literary Text in the Digital Age* (Ann Arbor: University of Michigan Press, 1996).
3. Curiously, the news media are constantly abuzz with reports of cyber-slacking and other forms of corporate-employee ambivalence, but without much critical reflection along the lines of what Michel de Certeau analyzed as “la perruque”—see Michel de Certeau, *The Practice Of Everyday Life* (Berkeley: University of California Press, 2002), 24–30.
4. A different concept of hypertext was proposed in Gérard Genette, *Palimpseste* (Paris: Gallimard, 1982), who opposes it to hypotext as defining transtextual relations.
5. Theodor Holm Nelson, “Opening Hypertext: A Memoir.” In *Literacy Online. The Promise (and Peril) of Reading and Writing with Computers*, edited by Myron C. Tuman (Philadelphia: University of Pennsylvania Press, 1992), 43–57. See Jacob Nielsen, *Multimedia and Hypertext* (Boston: AP Professional, 1996), 2; Norbert Bolz, “Zur Theorie der Hypermedien,” *Raum und Verfahren* (Basel: Stroemfeld/Roter Stern, 1993), 17–27, and Friedrich A. Kittler, “Bewegliche Lettern. Ein Rückblick auf das Buch,” *Kursbuch* 133 (1998), 195–200.
6. Not to forget a footnote on some recent books about the footnote, above all Anthony Grafton, *The Footnote. A Curious History* (Cambridge: Harvard University Press, 1997), who refuses to date the origin of footnoting but wants to “connect scattered threads of research,” and Chuck Zerby, *The Devil’s Details. A History of Footnotes* (Montpelier: Invisible Cities, 2002), a book that invites being read as an extended note to Grafton’s ambivalent defense of pedantry.
7. The radicalization of general self-annotation is playfully illustrated by Heath Bunting’s *readme.html* (1998), where every word is a hypertext link; see http://www.irational.org/heath/_readme.html.
8. George P. Landow, “Changing Texts, Changing Readers: Hypertext in Literary Education, Criticism, and Scholarship,” in *Reorientations: Critical Theories & Pedagogies*, edited by Bruce Henricksen und Thais E. Morgan (Urbana: Illinois University Press, 1990), 133–161; compare Paul Edwards, “Hypertext and Hypertension: Post-Structuralist Critical Theory, Social Studies of Science, and Software,” *Social Studies of Science* 24:2 (May 1994), 229–278.
9. For the claim that new media art presents a divorce of database interface and database content, see Lev Manovich, *The Language of New Media* (Cambridge: MIT Press, 2001), 226–227.
10. Aleida and Jan Assmann, “Schrift und Gedächtnis.” *Schrift und Gedächtnis* (Munich: Fink, 1983), 277 and 281.
11. Joseph Tabbi, “Review of Books in the Age of their Technological Obsolescence,” *American Bookreview* 17:2 (Dec 1995–Jan 1996), 31. Compare Jacques Derrida, who wondered “whether the digressive, complicated, parenthetical, sophisticated structure of this discourse, which seems to include notes within notes, infinitely *en abyme*, derives from the fact that I wrote it on a computer.” Jacques Derrida, “This is not an Oral Footnote,” in *Annotation and Its Texts*, edited by Stephen A. Barney (Oxford: Oxford University Press, 1991), 199.
12. Conrad Gessner, *Pandectarum sive partitionum universalium libri XXI* (Zurich 1548); compare H. Wellisch, “How to Make an Index—16th Century Style: Conrad Gessner on Indexes and Catalogs,” *International Classification* 8 (1981), 10–15. Despite Gessner’s recommendations, most libraries worked with printed and bound catalogs all the way into the mid-twentieth century.
13. See Christoph Meinel, “Enzyklopädie der Welt und Verzettlung des Wissens: Aporien der Empirie bei Joachim Jungius,” in *Enzyklopädien der frühen Neuzeit. Beiträge zu ihrer Erforschung*, edited by Franz Eybl, Wolfgang Harms, Hans-Henrik Krummacker, Werner Welzig (Tübingen: Niemeyer, 1995), 162–187.
14. Vincent Placcius, “De scrinio litterato,” *De arte excerpendi* (Stockholm and Hamburg, 1689), 121–159.
15. John Locke, “Méthode nouvelle de dresser des Recueils communiquée par l’Auteur,” *Bibliothèque universelle et Historique* (Amsterdam, 1668), vol. 2, 315–340; Jean Paul, *Das Leben des Quintus Fixlein* (Stuttgart: Reclam, 1987) and Jean Paul, “Die Taschenbibliothek.” In *Sämtliche Werke* II:3 (Frankfurt: Zweitauseneins, 1996), 772; Ch. G. von Murr, “Von Leibnizens Excerptirschränk,” *Journal zur Kunstgeschichte und allgemeinen Litteratur* VII (1779), 211, here cited after Markus Krajewski, “Zitatuträger. Aus der Geschichte der Zettel/Daten/Bank.” In *Anführen—Vorführen—Aufführen. Das Zitat in Literatur und Theorie*, edited by Nils Plath and Volker Pantenburg (Bielefeld: Aisthesis, 2002), 177–195.
16. “Only a historian of playing cards might find this relevant,” cautioned Jean-Baptiste Labiche, *Notices sur les dépôts littéraires et la révolution bibliographique* (Paris: Parent, 1880), 64. But see the commentary by Hans Petschar, “Einige Bemerkungen, die sorgfältige Verfertigung eines Bibliothekskatalogs für das allgemeine Lesepublikum betreffend.” In *Der Zettelkatalog. Ein historisches System geistiger Ordnung*, edited by Hans Petschar, Ernst Strouhal, Heimo Zobernig (Vienna: Springer 1999), 17.
17. Johann Jacob Moser, “Einige Vortheile für Cantzley-Verwandte und Gelehrte in Absicht auf Acten-Verzeichnisse, Auszüge und Register,” *Lebensgeschichte, von ihm selbst geschrieben* (Frankfurt and Leipzig, 1777), vol. 3; Karl Rosenkranz, *Georg Friedrich Wilhelm Hegels Leben* (Berlin, 1844), 12, and Hermann Schmitz, “Hegels Begriff der Erinnerung,” *Archiv für Begriffsgeschichte* 9 (1964), 37–44; compare Friedrich Kittler, *Die Nacht der Substanz* (Bern: Benteli, 1989), 18.
18. Günter Kunert, “Zettel,” *Akzente* 33:5 (1986), 391–394. See already Francesco Sacchini, *Über die Lektüre, ihren Nutzen und die Vortheile sie gehörig anzuwenden* (Karlsruhe, 1832), 101–102.
19. Raymond Carver, “On Writing,” *Fires. Essays, Poems, Stories* (New York: Vintage 1968), 22–27. Georges Perec, “Notes Concerning the Objects that are on my Work-Table,” *Species of Places and Other Pieces* (New York: Penguin 1999), 145 and 152. Perec’s novel *Life: A User’s Manual* (London: Harvill 1987) features characters who share his obsession with indexing; see also David Bellos, *Georges Perec: A Life in Words* (London: Harvill 1999), 207 and *passim*.

20. In 1981, when the Internet consisted of only 256 computers, Bob Kahn – co-designer of the TCP/IP networking protocol – was in charge of issuing Internet addresses and carried around index cards in his shirt pocket to keep track of newly issued addresses.
21. Harold Innis is the rare exception; the eighteen inches of index cards in his idea file were themselves indexed by means of another five inches of cards (Innis Papers, Archives of the University of Toronto, Thomas Fisher Library, Box 8). The cards themselves seem to be lost, but a typescript based on them was published as *The Idea File of Harold Innis* (Toronto: University of Toronto Press 1980).
22. Didier Eribon, *Conversations with Claude Lévi-Strauss* (Chicago: University of Chicago Press, 1991), vii–viii.
23. Daniel Ferrer, “Hypertextual Representation of Literary Working Papers,” *Journal of the Association for Literary and Linguistic Computing*, 10/2 (1995), 143–45; Tim William Machan, “Chaucer’s Poetry, Versioning, and Hypertext,” *Philological Quarterly* 73/3 (1994), 299–316.
24. Edward Barrett, ed. *The Society of Text*. Cambridge: MIT Press, 1989; Charles Platt, “Why Hypertext Doesn’t Really Work” *The New York Review of Science Fiction* 72 (August 1994), 1–5; Stuart Moulthrop, “You Say You Want a Revolution? Hypertext and the Laws of Media.” In *Essays in Postmodern Culture*, edited by Eyal Amiran und John Unworth (Oxford: Oxford University Press, 1993), 69–97; Robert Markley, ed. *Virtual Reality and its Discontents* Baltimore: Johns Hopkins University Press, 1996.
25. Vilém Flusser, *Schrift* (Düsseldorf: Bollmann 1995), 79.
26. Friedrich Kittler, “Geschichte der Kommunikationmedien,” *Raum und Verfahren* (Basel: Stroemfeld/Roter Stern 1993), 169–188, here: 183 and 186.
27. Jacques Lacan, “Psychanalyse et cybernétique, ou de la nature du langage,” *Le Séminaire, Livre II: Le moi dans la théorie de Freud et dans la technique de la psychanalyse* (Paris: Seuil, 1978), 339–354; see Laurence Rickels, “Cyber-Lacan,” *Nazi Psychoanalysis*, vol. 2 (Minneapolis: University of Minnesota Press, 2003), 60–62.
28. Jacques Derrida, *Glas* (Paris: Galilée, 1974). The fold of so-called “metalanguage” is irreducible like a pocket or cyst that incessantly forms anew; Derrida suggests that for this theoretical question, no other word is possible.
29. Jacques Derrida maintained that the horizon is the “*toujours-déjà-là* of a future that keeps the indeterminacy of infinite openness intact.” *Introduction à ‘L’Origine de la géométrie de Husserl’* (Paris: PUF, 1962), 123.
30. E.g., Darryl Laferte, “Hypertext and Hypermedia: Toward a Rhizorhetorical Investigation of Communication,” *Readerly/Writerly Texts: Essays on Literature, Literary/Textual Criticism, and Pedagogy*, 3/1 (Fall-Winter 1995), 51–68; Julian Stallabrass, *Internet Art. The Online Clash of Culture and Commerce* (London: Tate Publishing, 2003).
31. George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore: Johns Hopkins University Press 1992); and George P. Landow, ed. *Hyper/Text/Theory*. Baltimore: Johns Hopkins University Press, 1994.
32. Norbert Bolz, “Zur Theorie der Hypermedien,” *Raum und Verfahren* (Basel: Stroemfeld/Roter Stern 1993), 17–27, here: 17. See my own efforts at <http://www.hydra.umn.edu/derrida>.
33. Georg Henrik von Wright, “The Wittgenstein Papers,” *The Philosophical Review* 78:4 (1969), 483–563, here: 487.
34. George P. Landow, “Hypertext, Metatext, and the Electronic Canon,” in *Literacy Online: The Promise (and Peril) of Reading and Writing with Computers*, edited by Myron C. Tuman (Pittsburgh: University of Pennsylvania Press, 1992), 67–94.
35. See Paul de Man’s attack on Barthes’ literary-historical assumptions: “You distort history because you need a historical myth to justify a method which is not yet able to justify itself by its results,” in *The Structuralist Controversy: The Languages of Criticism and the Sciences of Man*, edited by Richard Macksey and Eugenio Donato (Baltimore: Johns Hopkins University Press, 1972), 150.
36. Roland Barthes, *S/Z* (Paris: Plon, 1970), 9–28, sections iv, v, ix. Compare Theodor Adorno, “Skoteinos, oder Wie zu lesen sei,” *Drei Studien zu Hegel* (Frankfurt: Suhrkamp, 1969), 105–173, e.g., 154: the retroactive injunction *already to have read* takes the form of a reprise.
37. Anna Everett, “Digitextuality and Click Theory: Theses on Convergence Media in the Digital Age,” in *New Media. Theories and Practices of Digitextuality*, edited by Anna Everett and John T. Caldwell (New York: Routledge/AFI, 2003), 3–28, referring to Barthes’ “narrative within a narrative” –see Roland Barthes, *S/Z* (New York: Hill and Wang 1974, 90). Jon Dovey, “Notes Toward a Hypertextual Theory of Narrative,” in *New Screen Media: Cinema/Art/Narrative*, edited by Martin Rieser and Andrea Zapp (London: BFI, 2002), 19–20, and Jon Dovey, *Desktop Theatre of Amnesia* (Liverpool: Moviola, 1995).
38. John Mowitt, *Text. The Genealogy of an Antidisciplinary Object* (Durham: Duke University Press, 1992), 117.
39. Mowitt, *Text*, 118. See Mowitt, “What is a Text Today?” *PMLA* 117:5 (2002), 1217–1221.
40. “An almost obsessive relation to writing instruments” (interview with Jean-Louis de Rambures of *Le Monde*, September 27, 1973), in Roland Barthes, *The Grain of the Voice* (Berkeley: University of California Press, 1985), 177–182.
41. Barthes, *The Grain of the Voice*, 182: “I have my index-card system, and the slips have an equally strict format: one quarter the size of my usual sheet of paper. At least that’s how they were until the day standards were readjusted within the framework of European unification.” But Barthes found solace about his mental health in this unwelcome change: “Luckily, I’m not completely obsessive. Otherwise, I would have had to redo all my cards from the time I first started writing.”
42. Barthes’ note card titled “fiches” reads: “D’origine érudite, la fiche devient le coin vengeur que le désir insère dans la loi compacte du travail. Principe poétique: ce carré savant ira dans le tableau de l’écriture, non dans celui du savoir.”
43. “Le fichier n’est pas le livre à venir: il n’y a pas d’œuvre manquante que quelques milliers de fiches inédites viendraient constituer. Barthes a écrit tout ce qu’il avait à écrire.” Nathalie Leger, “Immensément et en détail,” *R/B* (Paris: Centre Pompidou/Seuil/IMEC, 2002), 94. However, her co-editor Marianne Alphant thinks the notes for his last course limn the ichnographic *moi-poisson* book he was working towards: Marianne Alphant, “Presque un roman,” *R/B*, 125–128. And the executor of Barthes’ unpublished papers also believes “these courses revolve around the idea of a possible

- novel, a novel that death prevented him from writing." Eric Marty, "Interview with Jacques Henric," *Art Press* 285 (Decembre 2002), 51.
44. Roland Barthes, "Comment est fait ce livre," *Art Press* 285 (Decembre 2002), 55. Interestingly, Daniel Ferrer contends that at several points in his career, Barthes seemed to stop short of embracing genetic criticism: "Genetic Criticism in the Wake of Barthes." In *Writing the Image: After Roland Barthes*, edited by Jean-Michel Rabaté. Philadelphia: University of Pennsylvania Press 1997, 217–227.
 45. As Anne Herschberg Pierrot writes, *Roland Barthes par Roland Barthes* "manifests the pleasure of auto-commentary and of reflexivity which includes the relation of the author to his manuscript." Anne Herschberg Pierrot, "Les manuscrits de Roland Barthes par Roland Barthes. Style et genèse," *Genesis* 19 (2002), 195.
 46. Another recent proponent of the convergence theory along the lines of a generalized footnote is Joe Amato, "Endnotes for a Theory of Convergence," in *New Media. Theories and Practices of Digitextuality*, 255–264. This piece is written as if it contained only endnotes, but then nevertheless augmented by two supplemental "ending notes" after the main body of fake "endnotes" ends.
 47. Chris Marker, *IMMEMORY* (Paris: Centre Pompidou, 1998); Olia Lialina, *Anna Karenina Goes to Paradise*, <http://www.teleportacia.org/anna/>. For an overview of George Legrady's work, see *Catalogue George Legrady: From Analogue to Digital* (Ottawa, Ontario: National Gallery of Canada, 1998).
 48. Ernst von Salomon, *Der Fragebogen* (Reinbek: Rowohlt, 1951); translated, often inadequately but always valiantly, as *The Questionnaire* (Garden City, NY: Doubleday, 1955). Von Salomon takes as his poetic program the de-Nazification questionnaire handed to Germans after the end of World War II; while he answers some questions at epistolary length, others are merely marked with cross-references to later or earlier Q&A.
 49. Walter Benjamin, "Vereidigter Bücherrevisor," *Gesammelte Schriften* vol. IV.1 (Frankfurt: Suhrkamp, 1991), 102–104.
 50. Boyd Rayward, "The Case of Paul Otlet, Pioneer of Information Science, Internationalist, Visionary," *Journal of Librarianship and Information Science* 23 (Sept. 1991), 135–145, and Boyd Rayward, "Visions of Xanadu: Paul Otlet (1868–1944) and Hypertext," *Journal of the American Society of Information Science* 45 (1994), 235–250. See Paul Otlet, *Traité de Documentation* (Brussels: Editions Mundaneum, 1934).
 51. "One might consider these things eternal (e.g. storytelling), but one can also see them as temporal and problematic, dubious. Eternal things in narration. But probably totally new forms. Television, gramophone and so forth make all these things dubious." Walter Benjamin, "Vorstufen zum Erzähler-Essay," *Gesammelte Schriften* vol. II.3 (Frankfurt: Suhrkamp, 1990), 1282.
 52. The mathematician Alan Turing became famous for the unsolved test which was to show statistically that the distinction between human language and computer-generated language is beyond human capacity. (Turing usually referred to this as a "game," only twice does he call it a "test." See Alan Turing, "Computing Machinery and Intelligence," *Mind* vol. LIX, n. 236/1950, 433–460.) Arguably, if this game of imitation is to be decided this side of eternity, it must be stopped by someone who occupies the position of external observer. (See Jean Lassegue, "What Kind of Turing Test did Turing have in Mind?" *Tekhnema* 3/1996, 37–58.) Turing himself became the literary material, for instance in Ian McEwan, "The Imitation Game," *Three Plays for Television* (London: Picador, 1981), or in Alan Hodges, *The Enigma of Intelligence* (London: Allen Unwin, 1983). The artificial intelligence advocate Minsky even published a science fiction novel about Turing: Marvin Minsky, *The Turing Option* (New York: Warner Books, 1992).
 53. Friedrich Kittler, "Die künstliche Intelligenz des Weltkriegs: Alan Turing" In *Arsenale der Seele*, edited by F. Kittler and Georg Christoph Tholen. Munich: Fink, 1989, 198. Yet poets have been trying for a few decades to generate experimental computer poetry, referring to William Carlos Williams, who seemed to grant them permission when he wrote: "a poem is a small (or large) / machine made of words."
 54. Robert Pinsky, "The Muse in the Machine, or: The Poetics of Zork," *New York Times Book Review* March 19, 1995.
 55. Charles Hartman's program "Prose," somewhat unstable in DOS, but satisfying in its Apple OS version, is found at <http://www.conncoll.edu/ccother/cohar/programs/>
 56. Hugh Kenner und Joseph O'Rourke, "A Travesty Generator for Micros," *Byte* 9/12 (November 1984), 129–131, 449–469. Their fundamental insight is that material is limited; the challenges are posed by technical and economical iteration of connection.
 57. Alvin Kiernan, *The Death of Literature* (New Haven: Yale University Press, 1990); see the critique of Sven Birkerts' *Gutenberg Elegies* in Friedrich Kittler, "Computeralphabetismus," in *Literatur im Informationszeitalter*, edited by Dirk Matejowski and F. Kittler. Frankfurt: Springer, 1997, 237–251.
 58. See for instance Jochen Meißner, "Von der Schrift zum Hypertext. Typographie in der Schule der Atheisten," in 'Alles=Gewendet!' *Zu Arno Schmidts 'Die Schule der Atheisten*, edited by Horst Denkler/Carsten Würmann (Bielefeld: Aisthesis, 2000), 219–252.
 59. F. Peter Ott, "Tradition and Innovation: an introduction to the prose theory and practice of Arno Schmidt," *German Quarterly* 51:1 (1978), 26.
 60. See the contributions to the special issue of *Text & Kritik* 20 (1971), as well as Siegbert Praver, "Bless Thee Bottom! Thou Art Translated," in *Essays in German and Dutch Literature*, edited by WD Scott-Robson. London: Institute of Germanic Studies 1973, 156–191, and Heinrich Vormweg, "Traum eines Babylonikers," *Merkur* 25 (1971), 354–361.
 61. For the popular comparison of hypertext and Joyce, see Landow, *Hypertext*, 10: "implicit hypertext in nonelectronic form. Again, take Joyce's *Ulysses* as an example." Others draw Schmidt and Derrida's *Glas* into the mix. H.C. Lucas, "Zwischen Antigone und Christiane. Die Rolle der Schwester in Hegels Biographie und Philosophie und in Derridas *Glas*," *Hegel-Jahrbuch 1984–1985* (1988), 409–442, here 433: "ein Leseerlebnis, das wohl nur dem von Arno Schmidts *Zettels Traum* oder von James Joyces *Finnegans Wake* vergleichbar ist." More recently, Volker Langbehn considers *Zettels Traum* an "anti-classical work" like Joyce's *Finnegans Wake* and Derrida's *Glas*. See Volker Langbehn, *Arno Schmidts Zettels Traum: An Analysis* (Rochester: Camden House, 2003), 6; compare Söke Dinkla, "The Art of Narrative—Towards the Floating Work of Art." In *New Screen Media: Cinema/Art/Narrative*, 31–32.

62. Arno Schmidt, "Der Platz, an dem ich schreibe," *Essays und Aufsätze* vol. 2 (Zurich: Haffmanns Verlag, 1995), 28–31. For the history of library technology, see Markus Krajewski, *Zettelwirtschaft. Die Geburt der Kartei aus dem Geiste der Bibliothek* (Berlin: Kadmos, 2002).
63. Vladimir Nabokov, *Pale Fire* (New York: Putnam, 1962).
64. For further information, see Brian Boyd, *Nabokov's Pale Fire. The Magic of Artistic Discovery* (Princeton: Princeton University Press, 1999), and Markus Krajewski, "Ver(b)rannt im Fahlen Feuer. Ein Karteikartenkommentar," *Kunstforum International* 155 (June–July 2001), 288–292. As Krajewski notes, there is at least one book structured as a card game: Marc Saporta, *Composition numéro 1. Roman* (Paris: Seuil, 1962); see also Reinhold Grimm, "Marc Saporta oder der Roman als Kartenspiel," *Sprache im technischen Zeitalter* 14 (1965), 1172–1184.
65. Louis Zukovsky, *A* (Berkeley: City Lights, 1978), 525. For an introduction, see Don Byrd, "Getting Ready to Read 'A,'" *Boundary 2* 10:2 (winter 1982), 291–308.
66. Louis Zukovsky, *Bottom: On Shakespeare* (Austin: University of Texas Press, 1963); Hugh Kenner, "Bottom on Zukovsky," *Modern Language Notes* 90:6 (1975), 921–922.
67. Niklas Luhmann, "Kommunikation mit Zettelkästen. Ein Erfahrungsbericht," *Universität als Milieu*, ed. André Kieserling (Bielefeld: Haux, 1993), 53–61.
68. Niklas Luhmann, *Archimedes und wir. Interviews*. (Berlin: Merve, 1987), 142–149.
69. Detlev Krause, *Luhmann-Lexikon* (Stuttgart: UTB, 2001), as well as Claudio Baraldi, Giancarlo Corsi, Elena Esposito, *GLU. Glossar zu Niklas Luhmanns Theorie sozialer Systeme* (Frankfurt: Suhrkamp, 1997); and Theodor M. Bardmann and Alexander Lambrecht, *Systemtheorie verstehen. Eine multimediale Einführung in systemisches Denken* (Wiesbaden: Westdeutscher Verlag, 1999).
70. Joachim Maier and René Bauer, www.nic-las.com; on collaborative authorship, see also Martha Woodmansee, "On the Author Effect. Recovering Collectivity," *Cardozo Art and Entertainment Law Journal* 2 (1992), 279–292.
71. *From Memex to Hypertext: Vannevar Bush and the Mind's Machine*, ed. James M. Nyce and Paul Kahn (Boston: Academic Press, 1991). See Hilmar Schmudt, "Autor ex machina. Electronic Hyperfictions: Utopian Poststructuralism and the Romanticism of the Computer Age," *Arbeiten aus Anglistik und Amerikanistik* 19:2 (1994), 223–246.
72. Theodor Holm Nelson, "The Transclusion Paradigm," *Project Xanadu* (Sapporo Hyperlab, 1995), d8; compare Nelson, "A File Structure for the Complex, the Changing and the Indeterminate," in *Proceedings of the ACM 20th National Conference*, ed. Lewis Winner (ACM 1965); and Nelson, "What is Literature?" in *Literary Machines: The Report on, and of, Project Xanadu* (Swartmore, PA: Nelson, 1981).
73. Theodor Nelson, "Hypertext is Ready: HTML for Home and Office," *New Media* 5/8 (August 1995), 17. A working model of Nelson's Xanadu is found at www.udanax.com.
74. See also Peter Krapp, "Derrida Online," *Oxford Literary Review* 18 (1996), 159–173.
75. Jean-François Lyotard, "Dialectique, index, forme," *Discours, figure* (Paris: Klincksieck, 1971), 27–52, here: 41. Compare Geoffrey Bennington, *Legislations* (London: Verso, 1994), 274–294.
76. <http://www.thefileroom.org>; see Susan Snodgrass, "Antonio Muntadas: The file room," *New Art Examiner* 22 (October 1994), 48–49, and Judith Russi Kirshner, "The File Room," *Ars Electronica* 1995, <http://www.aec.at/festival1995/catalog/muntadas.html>.
77. For the presentation in Chicago, 138 file cabinets of four drawers each were placed around the ground floor of the Cultural Center; seven color monitors installed in various networked file cabinets invited the audience to point and click through case histories, sorted by location, time, medium, and reasons for censorship. A centrally located table with another computer allowed the entering of new cases.
78. Robert Atkins, "The Art World and I Go On Line," *Art in America* 83:12 (December 1995), 60, and Miriam Rosen, "Web-specific works: the Internet as a space for public art," *Art & Design* 11 (January-February 1996), 86–96.
79. *Art & Language, Index 01* (1972). Installation at P.S.1, New York, 1999 (Collection Daros, Switzerland); *Index 02* (1972), Installation Lisson Gallery, London, 1978 (Collection Herbert); *Index 05: Instructions for reading the index* (1973) (Collection Carine and Philippe Meaille, France). See the catalog to the PS1 retrospective *The Artist Out of Work: Art & Language 1972–1981*; some archived images can be found at <http://www.lissongallery.com/theArtists/Art&Language/artlanguage.html>.
80. The most recent version of *Webstalker* can be found at <http://bak.spc.org/ioid/>
81. Software engineering is "information hiding," where each module hides its function: see Jörg Pflüger, "Distributed intelligence agencies," in *Hyperkult: Geschichte, Theorie und Kontext Digitaler Medien*, edited by M. Warnke, W. Coy, G.C. Tholen (Frankfurt: Stroemfeld/Nexus, 1997), 433–460. See Laura U. Marks, "Invisible Media," in *New Media. Theories and Practices of Digitextuality*, 40.
82. Fredric Jameson, *The Political Unconscious* (Ithaca: Cornell University Press, 1980), 60–61.
83. Lev Manovich, "Old Media as New Media: Cinema." In *The New Media Book*, edited by Dan Harries (London: BFI, 2002), 209–218, here: 217.
84. See Steven Johnson, *Interface Culture* (New York: Basic Books, 1997).
85. Although secretaries in 17th-century France or Italy were forbidden to speak of their work in public, their confiscated speech never dampened their drive to express the master-medium dialectic of their employment. And as Foucault demonstrates, doctors (not unlike confessors) were figured as stenographer of the client's secrets, until the birth of the clinic forced them out of their secretarial role.
86. "Apparition de la fiche at constitution des sciences humaines: encore une invention que les historiens célèbrent peu." Michel Foucault, *Surveiller et punir. Naissance de la prison* (Paris: Gallimard, 1975), 287, referring to A. Bonneville, *De la recidive* (Paris, 1844), 92–93.

