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## PAPER SLIPS

### The Long Reign of the Index Card and Card Catalog

*Peter Krapp*

Before fading toward obsolescence, the index card and card catalog had developed into an influential technology of knowledge management and discovery: a mere clutch of paper scraps deployed to great effect not only in libraries but in academic research and in offices, for business and creative pursuits alike, permitting storage, processing, and transmission of data in discrete, mobile, uniform chunks that can be rearranged according to various principles.

Yet, is this range of applications for index cards completely obsolete? Certainly the index card as an informative object has faded in importance, and while you can still find purveyors of normed index cards among stationery or school and business supplies, it is a safe assumption that librarians, office managers, and writers no longer rely much on index cards, despite the fact that the card catalog long reigned supreme in those information environments. Few students today cram vocabulary, for instance, or formulae with index cards, yet a certain type of hipster will proudly own a piece of furniture originally designed for a library card catalog. However, while the object as such might have faded, arguably the affordances of a card index have not. Few among us maintain our own system of cross-references among browser bookmarks, recipe collections, metadata for CDs ripped to our gadgets, or any other sort of data collection, yet most of us have grown accustomed to associative indexing, from Amazon's reading suggestions based on your past browsing to streaming music service recommendations.

Certainly under the conditions of hypertext, as manifested across networked computers, the storing, processing, and transmitting of data (business data, library data, audio recording metadata, etc.) allows for a kind of serendipitous discovery of correlations and cross-references that were one strength of index cards, as valued by generations of writers, artists, and academics. One might say the card index lives on in a number of related formats: from hypercard stacks as introduced by Apple—maintained from 1987 to 2004 as a multimedia programming environment, for CD-ROM interactive content and games like *Myst* (1993)—to the generalized footnote we now call hypertext, and even to the ubiquitous slide decks, be they collated in PowerPoint or Keynote or Prezi. Each of these media exhibits features of what made index cards a success for centuries.

#### **From Library Catalogs to Accounting and Business**

A scholar is only a librarian's way of creating another scholar.

Daniel Dennett<sup>1</sup>

Establishing origins is, so often, hazardous terrain. A British historian of science, Staffan Mueller-Wille at the Centre for Medical History at the University of Exeter, recently claimed that Swedish natural scientist Carl Linnaeus (1707–1778), the father of modern taxonomy, had “invented” the card index to manage his information storage and retrieval. Working with paper slips that could be shuffled, updated, and sorted according to different criteria, Linnaeus certainly helped change the understanding of the natural world, away from linear filiation models and toward networks of characteristics that could be mapped.<sup>2</sup> Despite such claims, one can find index card systems that predate Linnaeus.

At the end of the 17th century, a comparison of techniques for excerpting led the German lawyer and librarian Vincent Placcius (1642–1699) to develop a “learned box” to enable the relational manipulation of notes.<sup>3</sup> German polymath Gottfried Wilhelm Leibniz (1646–1716) was able to buy such a piece of furniture to accommodate his paper slips in 1676.<sup>4</sup> And in the 16th century, Swiss doctor Conrad Gessner (1516–1565) reflected openly on how to generate and copy excerpts for a register, although then paper slips were usually threaded together.<sup>5</sup> For rhetorical memory, it was preferable not to work with loose sheets, as this could imperil the entire project if their positions were variable.<sup>6</sup> The ability to sort and shift entries in varying correlations was long perceived not as a valued feature of knowledge management, but as a dangerous weakness of excerpting, copying, and note-taking. 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. As Foucault demonstrates, doctors, like confessors, figured as stenographer of a client’s secrets, until the birth of the clinic forced them out of their secretarial role. Discussing the documentary system of surveillance, Foucault points to a “partly official, partly secret hierarchy” in Paris that had been using a card index to manage data on suspects and criminals at least since 1833. In a note, he dryly remarks: “Appearance of the card index and constitution of the human sciences: another invention the historians have celebrated little”.<sup>7</sup> Soon, card catalogs were used not just in a learned scholar’s study but in libraries and in business.

Upon taking office, librarians often complained about the lack of order in the stacks and catalogs, and went about reorganizing shelves and finding aids. Document mobility requires addressing and recombination both of what is cataloged and of catalogs themselves. The Viennese Imperial Library established a card catalog (around 300,000 paper slips in 205 boxes) of its holdings in 1780, featuring instructions for the cataloger, along with a flowchart for dividing indexing labors. As Krajewski tells it, however, it was an accidental reinvention at the Harvard College Library in 1817 that brought the card catalog to the New World. Instead of tackling the overwhelming task of cataloging all stock, William Crosswell cut up the partially bound catalogs compiled by his predecessors, allowing him to prepare a complete card index for over 20,000 volumes in less than six months.<sup>8</sup> But before the card index could also reign in office management, technical questions had to be settled.

In many places, the search for a normed paper slip size was conveniently 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 nationalized holdings was needed to make them accessible to the public. Librarians working for aristocrats and clergy resisted, since they had reason to fear that after an index went to Paris, the items themselves would soon follow. Thus, new instructions were issued to aides who would take stock where intractable librarians procrastinated. Regardless of local cataloging, they were to copy each item’s identifying information on a numbered playing card. The operation netted the commission 1.2 million cards, soon used to add 300,000 volumes to the national library.<sup>9</sup>

By the time energetic reformer Melvil Dewey returned from Europe to his roots in the United States (having played a lot of cards on the transatlantic voyage), the country was ready for the standardization by Dewey's business, Library Bureau. Patenting the card index and furnishing drawers that held 1,000 slips in two rows, he succeeded in getting the American Library Association to bless his index card format in 1877. Within a few years, the business found more demand from offices rather than libraries.<sup>10</sup> By 1896, Library Bureau supported census data in several countries, in major contracts with the Hollerith Tabulating Machine Company (renamed IBM as of 1924). Before punched cards took over, the humble paper slip economy made inroads in government and business offices around the globe.

Elsewhere, this method for a flexible knowledge repository was soon adapted and adopted by historians, writers, lawyers, and philosophers. And while the memory crutch and administrative kludge long goes unacknowledged, soon one sees card index techniques openly credited: while John Locke had published a 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.<sup>11</sup> As contemporaries of Hegel describe in detail, he systematically hoarded ideas and excerpts on note cards, and carried them with himself from his school days, when he started at age 15, to his death.<sup>12</sup> A similar system was described by Charles Darwin:

I keep from thirty to forty large portfolios, in cabinets with labeled shelves, into which I can at once put a detached reference or memorandum. I have bought many books and at their ends I make an index of all the facts that concern my work. Before beginning on any subject I look to all the short indexes and make a general and classified index, and by taking the one or more proper portfolios I have all the information collected during my life ready for use.<sup>13</sup>

One can find index cards at play all the way into the 20th century, for instance in Walter Benjamin's unfinished *Arcades Project* (1983/2002). Pioneering social scientist Beatrice Webb reported in her autobiography, *My Apprenticeship* (1980), of her attempts to persuade Oxbridge graduates that her index cards were "an indispensable instrument in the technique of sociological enquiry", and C. Wright Mills notes that what he called cross-classification was crucial in keeping index cards.<sup>14</sup> And indeed, all the way into the 20th century, the playing card remains one model for how to interact with paper slips to generate new knowledge.

### From the Scholarly to the Literary Card Index

Only a historian of playing cards might find this relevant.

—Jean-Baptiste Labiche<sup>15</sup>

Despite a respectable lineage, the card catalog mostly remained an anonymous, furtive factor in text generation, acknowledged merely as a memory crutch. Since the enlightened scholar is expected not just to reproduce knowledge but to produce innovative thought (not just as a recombination of good quotations, but opening new arguments and lines of investigation), knowledge management is a private matter, with rare exceptions. The question remains whether there is indeed a departure from the "neolithic mind" anthropologist 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.<sup>16</sup>

In his subversion of the rigorous constraints of memorial order by dint of chance and play, Lévi-Strauss seems to allow that his notes might 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 means of note cards or playing cards.

Ludwig Wittgenstein's papers, dispersed between Britain, Norway, Austria, and elsewhere, presented the executors of his estate with a conundrum when they found a box labeled ZETTEL ("paper slips"), containing 717 loose fragments, 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? Posthumous version control proved to be arduous. Not presuming to reconstruct what Wittgenstein had "meant" to say in unfinished notes, the editors ordered and published what they deemed significant from this card index. A typescript of 768 pages (labeled simply *The Big Typescript*) dated from 1933 had been in the estate since 1951, but only in 1967 were the "Zettel" recognized from which it was compiled. Cut-and-paste was integral: "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".<sup>17</sup>

Another important 20th-century thinker to rely on index cards was pioneering media theorist Harold Innis.<sup>18</sup> The executors of his estate published a tome called *The Idea File* (1980), composed of 18 inches of index cards, plus five inches of reference cards. Innis had a selection of hand-written index cards typed up and numbered, 1 through 339. It is unclear if these ruminations on television and art, communication and trade, secrecy and money, literature and the oral tradition, archives and history were intended to constitute a book project; the decision to publish the cards balances the putative will to posterity of an author, and the potential embarrassment of incomplete work. Clearly Innis intended to work synchronically rather than diachronically, to focus less on logical connections than on analogies, to practice pattern recognition—and the associative links of a card index lend themselves perfectly to this kind of project.

Similar features can be discerned in the silicon sociology of Niklas Luhmann's recombinant excerpts.<sup>19</sup> His card index cost him more time, he claimed, than writing his many books: little surprise that they demonstrate systematic redundancy.<sup>20</sup> Shortly after Luhmann's death in 1998, a dictionary and a glossary facilitated access to his thought, and an interactive database, marketed as "Luhmann on your computer", was offered on disk. A provocative question is whether from the depths of such a memory bank, further texts could be generated. Users of the Luhmann CD-ROM might try their hand at emulating his arguments within the recursive parameters of his systems theory.<sup>21</sup> A different approach to Luhmann's associative indexing is explored in another collaborative database tool, called nic-las in homage to the late sociologist ("nowledge integrating communication-based labeling and access system"), and billed as a "software prototype of an *autopoietic* knowledge landscape for social systems".<sup>22</sup> Intriguingly, deleted elements end up, for a while, in a digital unconscious: they remain searchable, and can 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.

With this transition to multimedia software imitating the card index, we arrive at the surmise that hypercard systems and hypertext online obey the index card logic of associative links. George Landow and other adopters of this convergence hypothesis claim that French cultural theorist Roland Barthes anticipated this.<sup>23</sup> Be it Proust, the daily newspaper, or the television screen—to Barthes, it was all text, so in the age of the Internet, it was going to be Barthes who always already anticipated its structures and strictures.<sup>24</sup> Barthes' writing lends itself to this, because he often read in a manner that generated, despite all categorical, classificatory zest, a déjà vu effect.<sup>25</sup> In *S/Z* (1970), 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 asserts that faced with the plural text, there is no such thing as forgetting its meaning: one truly reads only in such quasi-forgetting.<sup>26</sup> No surprise that distinctions Barthes made in 1960 between writerly and readerly texts return in 1968, and his semiological definition of text crops up in publications 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”.<sup>27</sup> 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 sonic 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*.<sup>28</sup>

Faced with such textual echo, Mowitt concludes “it becomes difficult to dismiss this tangle of associations as merely fortuitous.” The reason became widely evident when the *Centre Pompidou* mounted a big exhibition on Barthes: 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.<sup>29</sup>

From 1942 to his death, Barthes amassed 12,250 index cards, constantly rewritten and re-ordered. “There is a kind of censorship,” he 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”. But as Barthes confessed:

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.”<sup>30</sup> Once his papers became accessible to manuscript researchers, the scope of his card index could be studied. Written in pencil or blue ink, cards show quotes, observations, or diagrams; words or phrases are underlined, crossed out, or corrected. In the left or right top corner, he would note the date and page numbers of publications where he used the information on the card (e.g., a fiche on “acting out” refers to *S/Z* pages 71–72). Many cards show more than one use—including the passages noted by Mowitt.<sup>31</sup> Underlining or circling a word indicates it is taken up on another card (some cards list up to three such links). Outing his card catalog as co-author of his texts was “an anti-mythological action”, 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.” The editors of the exhibition catalog concluded that Barthes’ *fiches* are not the carcass of an unfinished project, despite his sudden death in 1980.<sup>32</sup> The last course Barthes taught, however, was called *La préparation du roman*, preparing the novel. Spread over two years, it simulates exercises leading up to a novel; soon after the last class, Barthes died from injuries sustained in a traffic accident. On the one hand, his death might have prevented him from actually writing his novel; on the other hand, the entire seminar, now published as a notebook, marks the novel as a lost object from the start. A postscript to his *Lover’s Discourse: Fragments* (1977) was going to discuss his card index and method of writing, as found only later among his papers.<sup>33</sup>

Tension between academic and literary production also propels a Swiss novel published posthumously in 2016, in a hybrid edition (in print and online) by the Swiss Literary Archives, presenting the textual genesis of a complex project. Hermann Burger’s *Lokalbericht* is a playful book written between 1970 and 1972.<sup>34</sup> The typescript of 177 pages had rested in the archives in part because of its provocative format—it is construed as the mutual contamination of two expansive decks of index cards, one working toward an academic dissertation and the other toward a quasi-autobiographical novel by a doctoral candidate. Their mixing up and cross-fertilization (page 45f.) is owed to a purported challenge tossed off by the protagonist’s thesis advisor, who joked about the career potential of an interpretation of a novel that does not yet exist—an invented time, place, and plot, an unknown author, an extended index card catalog on some 600 fragmentary pages somewhere between impressionism and expressionism, and *voilà*—the makings of a chair in new discoveries in literature. But realizing that creative ideas of this sort are all too rare in academia, the protagonist decides to explore this fantasy, and sets out to construe such a house of index cards, without completely abandoning his expected thesis on street names and places in the works of Günter Grass. Thus this card index novel starts with an imaginary letter to the advisor, along with the inevitable response the protagonist expects he would receive. In a historical context that sees Swiss literary figures and critics debate whether regional focus in writing is a limitation or a strength, a weakness or an intentional fountain of creative inspiration, the ridicule heaped on a dry-as-dust dissertation about place names and streets is only one elaboration of this debate, as Burger, throughout his career as a writer, emphasized the poetic potential of the local.<sup>35</sup>

The archival publication of the novel (in around 550 pieces) documents not only how Burger developed his verbal acrobatics, but also how, having been an advanced graduate student of literature at the University of Zurich for quite a while, he parodied and criticized academic prose in his work. The framing meta-fiction of a researcher struggling with two writing projects is an aspect of the novel that lends itself particularly well to a hyper-textual presentation.<sup>36</sup> That digital edition, prepared by the Swiss Literary Archive in collaboration with Cologne Center for eHumanities, not only presents high-resolution images of



the fragmentary typescript, but also documents the text-genesis with a range of variants and corrections Burger made, as well as an edited digital text version without any micro-genetic variances. Commingling traits of various genres, including but not limited to the *nouveau roman*, campus novel, ironic *Bildungsroman*, city novel, *roman à clef*, and picaresque novel, *Lokalbericht* is, above all, a meta-novel: a novel about writing and about the stakes of the 20th-century novel, with detailed reflections about production processes and conditions for crafting the narrative. When the protagonist interrupts his “local report” to intersperse letters to the reader or to characters in the book, he provides details not only about locations, place names, views, and other circumstances, but also, in one memorable passage, about the two typewriters he uses: ostensibly one for the dissertation and one for the novel, but soon they enter into other levels of competition. Describing them as a sporty red convertible and a classy grey-green sedan, a stylish Ferrari and a comfortable cruiser, he speculates about the best use of their different typefaces, and begins to worry about their rivalry. Soon he feels he needs to write about one on the other and vice versa—the well-damped luxury of the Hermes Media describes the thrill of the Olivetti Valentino (*sic*), the white letters on black keys here, black letters on off-white keys there, and so on (pages 21–26). The same recursive structure is observed in the two growing card indices that mutually contaminate each other, one aiming at a novel, one at a dissertation:

Who pulls the hollow tooth within which the paper scrap with the story of the hollow tooth is hidden? Once there was an old man who had a hollow tooth. In that tooth there was a box, and in the box, a piece of paper that said: once there was an old man.

(page 207)

Much the same mockery is directed at the academic and critical figures that are part of the framing narrative; Kleinert the professor and Neidthammer the literary agent are the beginning and the end of the literary frame, and both figures are barely veiled representations of real people (the Zurich academic Emil Staiger, who was in fact Hermann Burger’s doctoral advisor, and the local literary critic Anton Krättli whom Burger had known since 1963). Indeed, the critic has the last word, advising the protagonist not to write the projected novel but to let the manuscript age a year, two years, ten years—the book closes with the critic’s advice not to finish and publish that very book (page 228). And the more the protagonist accidentally mixes his notes for the novel into the notes for the dissertation and vice versa, the more obvious it becomes that the incompleteness of the novel is a mere simulation, while the completion of a dissertation recedes into the distance with the increasing poetic use of the academic ideas about contemporary novels (page 101). Beyond this rivalry, however, the project becomes legible as an archival fiction, and archive novel, which the reader puzzles together from the index card notations that form a montage of varied textual and fictional or metafictional levels. Unsurprisingly, one finds references to other novels that rely explicitly on index cards, for instance Arno Schmidt’s notorious *Zettel’s Traum* (1970).

Voraciously citing, inveterately punning, Schmidt, like Burger, distilled his card index into 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-inches in size, and managed to publish it as *Zettel’s Traum* the following year. But he sought recognition not only as a 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”.<sup>37</sup> 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. Page (or card) 914 of this proto-hypertext contains the passage most critics view as the key to this gigantic structure.<sup>38</sup> 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, happens to men in their fifties, when the sex drive wanes and gives way to what the detached, smiling alter-ego of the author represents. Such unrelenting artifice stands in the way of naive investments in make-believe, auctorial inspiration, or genius.<sup>39</sup>

These textual devices have a long literary history, although it is relatively rare that creative writers make them known. Gerhart Hauptmann “wrote his nocturnal ideas on the wallpaper near his bed”, then cut it up to paste it into his daily output.<sup>40</sup> Similar textures are also evident in Michel Butor’s *Mobile* (1962), or in Vladimir Nabokov’s *Pale Fire* (1962), 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.<sup>41</sup> 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.<sup>42</sup> Similar concerns accompanied the posthumous publication of another Nabokov novel, or scraps for one, which is extant on index cards; indeed Nabokov wrote most of his novels, including *Lolita* (1955) and *Pale Fire*, on index cards. His novel *Ada or Ardor: A Family Chronicle* (1969) takes up over 2,000 cards, *The Original of Laura* (2009) consists of 139 transcribed cards.<sup>43</sup> Jules Verne’s writing is equally illuminated by the reflective fire of a card index, since the source code for his science fiction was a box of some 20,000 excerpts and notes on scientific journals and books.<sup>44</sup> Raymond Carver taped citations and fragments on three- by five-inch 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.<sup>45</sup>

### From Individual Collections to Art Installations

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.

—Walter Benjamin<sup>46</sup>

By 1969, it had become possible for Lucy Lippard to curate an art exhibit in Seattle titled *557,087* with index cards she had solicited, including from notables such as Eva Hesse and Robert Smithson, arranging black and white photographs and the index cards in glass cases.



Taking its title from the 1960 census figure for Seattle, the show was archived as revolutionary, despite and because of the fact that it did not leave behind paintings and sculptures, but a stack of 4- by 6-inch cards from around 60 artists, among them many names now famous for conceptual art or minimalism. The concept also traveled to Vancouver (where its title became *955,000*) and Buenos Aires (as *2,972,453*) before returning to the Seattle Art Museum.<sup>47</sup>

What art historian Aby Warburg laid out in his *Mnemosyne Atlas*, namely pattern recognition that operates by analogy and associative linking rather than diachronic filiations, finds its purest expression in art installations pivoting on index cards. But is notation on mobile paper slips outdated in the computer age, and reduced to ad-hoc jottings on sticky notes? Arguably, the card index influenced not only knowledge management, but interface design and creative processes.<sup>48</sup> A late example for the former: in 1981, when the Internet consisted of just 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.<sup>49</sup> As for the creative potential: it would appear to reside in part in material resistance on the one hand, and in harnessing chance on the other—as when Brian Eno designed a deck of inspirational cards titled “oblique strategies” (1975), or when Marshall McLuhan sold a deck of playing cards with provocative quotes as a management game called “Distant Early Warning” (1969). One wonders whether despite all the continuities in card index use over the centuries, there are not aspects of the index card catalog that are in peril of disappearing in the transition of valuable traits and affordances of index cards into other formats. Can everything be transcoded? This question motivated the artist David Bunn, who found pencil marks, hand-written corrections, drawings, finger prints, chocolate smears, and other manifestations of what he calls “subliminal messages” in the discarded card catalog of the Los Angeles Central Library. Focusing on these aesthetic communications that the electronic catalog did not preserve, Bunn developed art installations in dogged pursuit of contingent traces.<sup>50</sup> As if offering to make a connection between the aforementioned Roland Barthes exhibit at the Pompidou and David Bunn’s art installations a continent away, Christian Marclay also mounted index cards so as to fill the walls of an art gallery, calling it “White Noise”.<sup>51</sup>

A famously more conspiratorial example in the art world of the use of index cards involves Mark Lombardi. His drawings, based on his own index card catalog of public sources, trace relationships between powerful financial and political figures, such as oil companies, the Bush family, the Bin Laden family, and various banks. A few weeks after the September 11, 2001 terrorist attacks, an FBI agent called the Whitney Museum of American Art and asked to see a drawing on exhibit there.<sup>52</sup> Lombardi allegedly committed suicide the year before. Using just a pencil and a huge sheet of paper, Lombardi had created an intricate pattern of curves and arcs to illustrate the links between global finance and international terrorism. Meanwhile, a collector made a substantial offer to the show’s curator, Robert Hobbs, a professor of art history at Virginia Commonwealth University, for the purchase not of any drawings, but of Lombardi’s extensive index card collection.<sup>53</sup> Thus it appears that a poetics of intellectual capital can be embodied in the card index.

Other artists noted that an “index” can also denote repression and censorship. *The File Room* (1994) by Antoni Muntadas is one of the first widely recognized art works on the World Wide Web—a pioneering work of net art inviting online collaboration to document censorship (thefileroom.org). On display at the Randolph Street Gallery of the Chicago Cultural Center as well as online, *The File Room* started in May 1994 with 450 entries on censorship, from Athens in the fifth century BC to Salman Rushdie’s *The Satanic Verses* (1988); 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”. Moreover, the installation invited members of the public not only to browse the card index or website, but also to add entries about current or historical bias regarding religion, ideology, or sexual orientation. Visitors in Chicago and online were able to interact and contribute, emphasizing that an archive of censorship can never be closed or complete. The installation featured a computer on a desk, surrounded by 138 black metal filing cabinets of four drawers each; seven of the 552 cabinet drawers were taken up by computer monitors. *The File Room* offers definitions of censorship, an archive of cases, an interface used to submit additional cases, a bibliography, and a search tool—by date, subject, location, and medium. Today, the National Coalition Against Censorship maintains *Censorpedia* ([wiki.ncac.org](http://wiki.ncac.org)) as a participatory wiki of censorship from antiquity to the present, building on Muntadas’s *File Room*.

Censorship is a thorny topic, as it seeks not only to suppress images, sounds, and words, but also to hide the means of suppressing them. Muntadas called himself an “information analyst”.<sup>54</sup> As Edward Shanken writes, the creators of *The File Room* were “concerned about the potential of technology both to support and resist censorship”.<sup>55</sup> As with his pioneering contributions to CD-ROM art in the 1990s, Muntadas put some thought into affording interactivity without yielding control over the installation to viewers, balancing access with maintenance, both in the card index and online. Announcing *The File Room* during a residency in September 1993 at the University of Illinois, Muntadas worked with gallery director, Paul Brenner, as project manager and Maria Roussos as hypertext developer for over two years. Drawing on the capabilities of the NCSA Mosaic browser (1993–1997) and starting with definitions before branching out into cases, *The File Room* comprises examples from visual art, music, dance, and literature. Curator Steve Dietz associates Muntadas’s art with the “dream of the open work” as inspired by Umberto Eco: “one of the strongest shifts of emphasis in the digital age has been on the production side and on the movement from creating finished works of art to creating systems for the production of art”.<sup>56</sup> As Muntadas moved beyond the gallery’s index cards onto the Internet, he described the project as “a social sculpture *à la* Joseph Beuys which gains its meaning through a group effort”.<sup>57</sup> Institutions taking on net art and web art (such as the ZKM in Karlsruhe, the Walker Art Center in Minneapolis, the Whitney Museum in New York, and the San Francisco Museum of Modern Art) emphasize that this is not merely a different exhibition space, but a different modality for aesthetic communication.<sup>58</sup> Muntadas’s *The File Room* is indebted to conceptual works of the Art & Language collective—card stacks such as *Index 01* (1972), eight cabinets of variable dimensions (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”. These installations, pillars of database art, illustrate how information lies dormant until it is accessed through an interface, but also how that same interface might distort information. They illustrate the perennial tension between attempts to erase, suppress, or hide information, and efforts to document historical, geographical, and topical dimensions of creation and censorship. This tension motivates art projects with index cards in the computer age, counting on the material resistance of analog remainders.

## Notes

- 1 Daniel Dennett, *Darwin’s Dangerous Idea* (London: Penguin, 1995), 202, alluding to Samuel Butler (who wrote in his *Life and Habit*, 1877, that “a hen is only an egg’s way of making another egg”).
- 2 British Society for the History of Science, “Carl Linnaeus Invented the Index Card,” *Science Daily* (June 16, 2009), [www.sciencedaily.com/releases/2009/06/090616080137.htm](http://www.sciencedaily.com/releases/2009/06/090616080137.htm). Compare Jonathan

- Schiffman, "How the Humble Index Card Foresaw the Internet," *Popular Mechanics* (February 11, 2016) [www.popularmechanics.com/culture/a19379/a-short-history-of-the-index-card/](http://www.popularmechanics.com/culture/a19379/a-short-history-of-the-index-card/)
- 3 Vincent Placcius, "De scrinio litterato," *De arte excerpendi* (Stockholm and Hamburg, 1689), 121–159.
  - 4 Christoph Gottlieb von Murr, "Von Leibnizens Exzerpirschrank," *Journal zur Kunstgeschichte und allgemeinen Litteratur* (1779), #7, 210–212.
  - 5 Conrad Gessner, *Pandectarum sive partitionum universalium libri XXI* (Zurich 1548); see H. Wellisch, "How to Make an Index—16th Century Style: Conrad Gessner on Indexes and Catalogs," *International Classification* 8 (1981), 10–15.
  - 6 Christoph Meinel, "Enzyklopädie der Welt und Verzettlung des Wissens: Aporien der Empirie bei Joachim Jungius," in Franz Eybl, Wolfgang Harms, Hans-Henrik Krummacher, and Werner Welzig eds., *Enzyklopädien der frühen Neuzeit. Beiträge zu ihrer Erforschung* (Tübingen: Niemeyer, 1995), 162–187.
  - 7 "Apparition de la fiche et constitution des sciences humaines: encore une invention que les historiens célèbrent peu." Michel Foucault, *Surveillir et punir. Naissance de la prison* (Paris: Gallimard, 1975), 287, referring to A. Bonneville, *De la recidive* (Paris, 1844), 92–93.
  - 8 <https://hollisarchives.lib.harvard.edu/repositories/4/resources/4004>. Compare Markus Krajewski, *Paper Machines: About Cards & Catalogs, 1548–1929* (Cambridge: MIT Press, 2011).
  - 9 Hans Petschar, "Einige Bemerkungen, die sorgfältige Verfertigung eines Bibliothekskatalogs für das allgemeine Lesepublikum betreffend." In Hans Petschar, Ernst Strouhal, and Heimo Zobernig eds., *Der Zettelkatalog. Ein historisches System geistiger Ordnung* (Vienna: Springer, 1999), 17. Compare Heike Gfereis and Ellen Strittmatter, eds., *Zettelkästen. Maschinen der Phantasie* (Marbach: Deutsche Schillergesellschaft, 2013).
  - 10 Wayne Wiegand, *Irrepressible Reformer: A Biography of Melvyl Dewey*. Chicago: American Library Association, 1996.
  - 11 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 Exzerpirschrank," *Journal zur Kunstgeschichte und allgemeinen Litteratur* VII (1779), 211; Markus Krajewski, "Zitatzutträger. Aus der Geschichte der Zettel/Daten/Bank." *Anführen—Vorführen Aufführen. Das Zitat in Literatur und Theorie*, eds. Nils Plath and Volker Pantenburg (Bielefeld: Aisthesis, 2002), 177–195.
  - 12 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; Hermann Schmitz, "Hegels Begriff der Erinnerung," *Archiv für Begriffsgeschichte* 9 (1964), 37–44; Friedrich Kittler, *Die Nacht der Substanz* (Bern: Benteli, 1989), 18.
  - 13 Nora Barlow ed., *The Autobiography of Charles Darwin 1809–1882* vol. 1 (London: Collins, 1958), 137.
  - 14 Beatrice Webb, *My Apprenticeship* (Cambridge: Cambridge University Press, 1926), 426–433; C. Wright Mills, *The Sociological Imagination* (London: Penguin, 1970), 217–245.
  - 15 Jean-Baptiste Labiche, *Notices sur les depots littéraires et la révolution bibliographique* (Paris: Parent, 1880), 64; Hellmut Lehmann-Haupt, *Gutenberg and the Master of the Playing Cards* (New Haven, CT: Yale University Press, 1966). There is at least one book structured as a card game: Marc Saporta, *Composition numéro 1: Roman* (Paris: Seuil, 1962); see Reinhold Grimm, "Marc Saporta oder der Roman als Kartenspiel," *Sprache im Technischen Zeitalter* 14 (1965): 1172–1184.
  - 16 Didier Eribon, *Conversations with Claude Lévi-Strauss* (Chicago: University of Chicago Press, 1991), vii–viii; Claude Lévi-Strauss, *Structural Anthropology* (New York: Basic Books, 1963), 129f.
  - 17 Georg Henrik von Wright, "The Wittgenstein Papers," *The Philosophical Review* 78:4 (1969), 483–563, here: 487.
  - 18 Innis Papers, Archives of the University of Toronto, Thomas Fisher Library, Box 8. The cards themselves appear lost, but a typescript based on them was published posthumously: William Christian, *The Idea File of Harold Adams Innis* (Toronto: University of Toronto Press, 1980).
  - 19 Niklas Luhmann, "Kommunikation mit Zettelkästen. Ein Erfahrungsbericht," *Universität als Milieu*, ed. André Kieserling (Bielefeld: Haux, 1993), 53–61. Compare *Evernote* (<http://evernote.com>) and *Zettelkasten* ([www.verzetteln.de/synapsen](http://www.verzetteln.de/synapsen)).
  - 20 Niklas Luhmann, *Archimedes und wir. Interviews*. (Berlin: Merve, 1987), 142–149; William Rasch, "Theory of a Different Order: A Conversation with Katherine Hayles and Niklas Luhmann," *Cultural Critique* 31:2 (autumn 1995), 7–36.
  - 21 Detlev Krause, *Luhmann-Lexikon* (Stuttgart: UTB, 2001); Claudio Baraldi, Giancarlo Corsi, Elena Esposito, *GLU. Glossar zu Niklas Luhmanns Theorie sozialer Systeme* (Frankfurt: Suhrkamp,

- 1997); Theodor M. Bardmann and Alexander Lambrecht, *Systemtheorie verstehen: Eine multimediale Einführung in systemisches Denken* (Wiesbaden: Westdeutscher Verlag, 1999).
- 22 Nic-las, 1999–2005, [www.nic-las.com](http://www.nic-las.com) (30.11.2005); compare [www.iasl.uni-muenchen.de/links/GCA-VI.2e.html](http://www.iasl.uni-muenchen.de/links/GCA-VI.2e.html)
- 23 George P. Landow, “Hypertext, Metatext, and the Electronic Canon,” in Myron C. Tuman ed., *Literacy Online: The Promise (and Peril) of Reading and Writing with Computers* (Pittsburgh: University of Pennsylvania Press, 1992), 67–94.
- 24 Katherine Hayles, “Information or Noise? Competing Economies in Barthes’s S/Z and Shannon’s Information Theory,” in George Levine ed., *One Culture: Essays in Literature and Science* (Madison: University of Wisconsin Press, 1987), 119–142.
- 25 This was 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 Richard Macksey and Eugenio Donato eds., *The Structuralist Controversy: The Languages of Criticism and the Sciences of Man* (Baltimore: Johns Hopkins University Press, 1972), 150.
- 26 Roland Barthes, *S/Z* (Paris: Plon, 1970), 9–28, esp. iv, v, ix.
- 27 John Mowitz, *Text: The Genealogy of an Antidisciplinary Object* (Durham: Duke University Press, 1992), 117.
- 28 Mowitz, *Text*, 118. See Mowitz, “What is a Text Today?” *PMLA* 117:5 (2002), 1217–1221.
- 29 “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.
- 30 Barthes, *The Grain of the Voice*, 182. My reading of Barthes’ *fichier* has been indexed, as it were, by Rowan Wilken, “The Card Index as Creativity Machine,” *Culture Machine* 11 (2010), 7–30.
- 31 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.”
- 32 “Le fichier n’est pas le livre à venir: il n’y a pas d’oeuvre manquante que quelques milliers de fiches inédites viendraient constituer. Barthes a écrit tout ce qu’il avait à écrire.” Nathalie Leger, “Immensement et en détail,” *R/B* (Paris: Centre Pompidou/Seuil/IMEC, 2002), 94. Co-editor Marianne Alphant thinks the notes for his last course limn the ichnographic *moi-poisson* book he was working toward: Marianne Alphant, “Presque un roman,” *R/B*, 125–128. 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 (December 2002), 51.
- 33 Roland Barthes, “Comment est fait ce livre,” *Art Press* 285 (December 2002), 55; Daniel Ferrer, “Genetic Criticism in the Wake of Barthes,” in Jean-Michel Rabaté ed., *Writing the Image: After Roland Barthes* (Philadelphia: University of Pennsylvania Press, 1997), 217–227. See Denis Hollier, “Notes (on the Index Card),” *October* 112 (spring 2005), 35–44. *Roland Barthes par Roland Barthes* “manifests the pleasure of auto-commentary and of reflexivity which includes the relation of the author to his manuscript,” asserts Anne Herschberg Pierrot, “Les manuscrits de Roland Barthes par Roland Barthes. Style et genèse,” *Genesis* 19 (2002), 195.
- 34 Hermann Burger, *Lokalbericht* (Zurich: De Gruyter, 2016).
- 35 Magnus Wieland and Simon Zumstiegl, “Hermann Burgers Lokalbericht: Von der Archivfiktion zur Archivedition,” *Germanistik in der Schweiz* 9 (2012), 91–109.
- 36 [www.lokalbericht.ch](http://www.lokalbericht.ch)
- 37 F Peter Ott, “Tradition and Innovation: An Introduction to the Prose Theory and Practice of Arno Schmidt,” *German Quarterly* 51:1 (1978), 26.
- 38 Siegbert Praver, “Bless Thee Bottom! Thou Art Translated,” in WD Scott-Robson ed., *Essays in German and Dutch Literature* (London: Institute of Germanic Studies, 1973), 156–191.
- 39 Arno Schmidt, “Der Platz, an dem ich schreibe,” *Essays und Aufsätze* vol. 2 (Zurich: Haffmanns Verlag, 1995), 28–31.
- 40 Günter Kunert, “Zettel,” *Akzente* 33:5 (1986), 391–394. Also Francesco Sacchini, *Über die Lektüre, ihren Nutzen und die Vortheile sie gehörig anzuwenden* (Karlsruhe, 1832), 101–102.
- 41 Vladimir Nabokov, *Pale Fire* (New York: Putnam, 1962).
- 42 Brian Boyd, *Nabokov’s Pale Fire: The Magic of Artistic Discovery* (Princeton: Princeton University Press, 1999); Markus Krajewski, “Ver(b)rannt im Fahlen Feuer. Ein Karteikartenkommentar,” *Kunstforum International* 155 (June–July 2001), 288–292.

- 43 Vladimir Nabokov, *The Original of Laura* (London: Knopf, 2009). See also Richard Sieburth, “Leiris/Nerval: A Few File Cards,” *October* 112 (spring 2005), 51–62.
- 44 Vladimir Stibic, *Tools of the Mind* (Amsterdam: Elsevier, 1982), 77; Stibic also mentions Jack London’s index cards.
- 45 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.
- 46 Walter Benjamin, “Vereidigter Bücherrevisor,” *Gesammelte Schrift en* vol. IV.1 (Frankfurt: Suhrkamp, 1991), 102–104.
- 47 Jen Graves, “Dematerialized: A 1969 Exhibition on Index Cards,” *The Stranger* (May 3, 2013), and Lucy Lippard, “Curating by Numbers,” *Tate Papers No. 12*, [www.tate.org.uk/research/publications/tate-papers](http://www.tate.org.uk/research/publications/tate-papers).
- 48 A pair of journalistic articles in the same business magazine explores the half-life of the sticky note: just four years after running a piece declaring the sticky note obsolete, *Fast Company* speculates it could indeed become the latest innovation technology. James Hunt, “Why Designers Should Declare Death to the Post-It” (May 20, 2010), and David Lavender, “How the Post-It Note Could Become the Latest Innovation Technology” (March 26, 2014).
- 49 Katie Hafner and Matthew Lyon, *Where Wizards Stay Up Late: The Origins of the Internet* (New York: Simon and Schuster, 1996); Janet Abbate, *Inventing the Internet* (Cambridge, MA: MIT Press, 1999); Michael Hauben, “Behind the Net: The Untold History of the ARPANET and Computer Science,” [www.columbia.edu/~rh120/ch106.x07](http://www.columbia.edu/~rh120/ch106.x07)
- 50 David Bunn, *Subliminal Messages* (Cologne: Walter König, 2004). Compare David Bunn, “A Place for Everything and Everything in its Place,” *Discourse* 20:3 (fall 1998), 175–178; and David Bunn, “Bodysnatching,” *Discourse* 24:1 (winter 2002), 120–148.
- 51 Christian Marclay, “White Noise,” Kunsthalle Bern, Switzerland, 1998; Fawbush Gallery New York, 1994; and daadgalerie Berlin, 1994. See Russell Ferguson, *Christian Marclay* (UCLA Hammer Museum 2003), 184–187.
- 52 NPR Weekend Edition, Saturday, November 1, 2003. Compare Patricia Goldstone, *Interlock: Art, Conspiracy, and the Shadow Worlds of Mark Lombardi* (London: Counterpoint, 2015).
- 53 See Frances Richard, “Obsessive – Generous: Toward a Diagram of Mark Lombardi,” in *Mark Lombardi: Global Networks* (New York: Independent Curators Inc., 2003), 115–118. A photo of Lombardi’s pink and green index cards appears there.
- 54 Slavko Kacunko, *Closed Circuit* (Berlin: Logos, 2004), 305/372; see Antoni Muntadas & Anne-Marie Duguet, *Muntadas: Media Architecture Installations* (Paris: Centre Georges Pompidou, 1999).
- 55 Edward Shanken, *Art and Electronic Media* (London: Phaidon, 2009), 35.
- 56 Steve Dietz, “Ten Dreams of Technology,” *Leonardo* 35:5 (2002), 509–522, here: 512.
- 57 Margot Lovejoy, *Digital Currents: Art in the Electronic Age* (London: Routledge, 2004), 248.
- 58 Steven Wilson, *Information Arts* (Cambridge: MIT, 2002), 563.