Reading Platforms: A Brief History of the Electronic Book

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To imagine a possible future of the book, in light of its pasts, I would like to present not so much a final shape or an object, but rather a sketch — a roadmap — for the study of objects that very much resemble books, yet require a theoretical reconfiguration so as to appear to the critical gaze in their full complexity and sheer alien difference to the familiar — still not without their mystery — constellations made of paper and ink. This sketch will be an opportunity to introduce several terms borrowed from the fields of media studies and computer science, terms that should equip us to better understand those areas of the map already explored and those still in need of description, pathfinding, and analysis. The interleaved media archaeology of several electronic books will serve to ground theoretical principles in observed particulates.

Key to this understanding is a presupposition shared by most book historians, philologists, textual critics, and media scholars, which manifests in the attention to the social and material contexts of ideational content, in light of which a book represents, at once, a metaphysical construct of the mind, a physical object, and a practice of reading. Matter envelops symbol to produce a specifically instantiated thing. Therefore, a reader’s ability to reach anything like content — a work of art — is circumscribed by the medium within which such content is embedded — an object of art — further contained by the social structures that once again mediate and are mediated by their symbolic and technological containments.

A reader’s inability to “grasp the shadowy and fantasmal form of the book” in its entirety, “to hold it fast, to turn it over and survey it at leisure”[[1]](#endnote-2) stems from the fundamental incompatibilities between the innermost symbolic, discursive, realms and the outermost, corporeal, and embodied techniques of comprehension: the first, limited by the expressive possibilities of language and the second by the cognitive and perceptual mechanics of the human body. Techniques of mediation between the two are thereby neither wholly determinate nor wholly socially constructed. Rather, they develop through a series of negotiated protocols, by which specific interfaces or channels of transmission develop between disparate symbolisms and physicalities. The trans-mediation of mind-things into paper and ink things entails the corresponding trans-figuration of content, the latter in the simple sense of that which is being contained. A line of reasoning inhabits a paragraph on a page, although the two structures do not transpose perfectly. The structure of thoughts in the mind — their transcendent form — and the structure of lines on a page — their immanent format — meet at the interface of two incompatible systems, the symbolic and biological. An interface enables the compatibility between physically heterotopic systems at the point of contact. In this way, the tail end of a fork is moulded to conform to the hand, where it begins to resemble a hand, bearing the imprint of a palm and its digits. A hand for its part becomes more fork-like in the grasping of the tool. Similarly, the interface of a digital book is that physical adaptation that allows for the physical exchange between between mind and symbol, reshaping both in the process of transmission.

“To continue reading at today’s speed I must have a machine,” Bob Brown wrote in his famous avant-garde manifesto *Readies* (1930), which some scholars take to presage the electronic book. To these ends he imagined “a simple reading machine which I can carry or move around, attach to any old electric light plug and read hundred thousand word novels in ten minutes if I want to, and I want to.”[[2]](#endnote-3) Print matter in Brown’s vision would be distributed in “dainty pillboxes” on mechanized rolls, wound automatically past a magnifying glass. “My machine is equipped with controls so the reading record can be turned back or short ahead,” he wrote, “a chapter reread or the happy ending anticipated.”[[3]](#endnote-4)

However, Brown’s portentions did not rise out of a vacuum — they were accompanied by over a century of technological developments in micrographic print, a history that itself was concomitant with advances in photography. Where Nicéphore Niépce and Louis Jacques Mandé Daguerre are conventionally considered to have invented photography in the 1830s, by 1857 the *Encyclopaedia Britannica* included a discussion on “microscopic photography,” by which tiny “copies of dispatches and valuable paper and plans might be transmitted by post, and secrets might be placed in spaces not larger than a full stop or a small blot of ink.”[[4]](#endnote-5) It is reported that the French photographer René Dagron sent more than 60,000 micrographic messages by pigeon carrier during the Prussian siege of Paris in 1870 and in 1872 the Russian imperial military experimented with micrographic maps for concealment and espionage.[[5]](#endnote-6) “It is natural that such results appear miraculous,” wrote a pair of librarian-engineers presenting their ideas “On a New Form of the Book: The Microphotographic Book” (*Sur une forme novelle du livre: le livre microphotographique*) at the convention of Institut International de Bibliographie held in Marseilles, France in 1906. Placed into a “simple enlarger” and illuminated, text would be “projected on a ground glass that closes the opposite side of the *camera obscura*,” the authors explained. “It is there that the reading of text will take place,” they wrote:

A slide positioned on the stage of a microscope of the carriage of a typewriter will circulate the fiche from left to right and top to bottom. Then at the reader’s will, the microphotographic pages on each centimeter of the film will come successively in front of the lens to be read.[[6]](#endnote-7).

In the United States, the long history of micrography included portable devices such as B.A. Fiske’s “Reading Machine,” consisting of a hand-held magnifying glass wand (Figure 1) that was to be passed over paper-tape medium (labelled 10 on the illustration). “I find it is entirely feasible,” Fiske wrote, “by suitable photographic or other process, to reduce a two and one-half inch column of typewritten or printed matter to a column of one-quarter of an inch wide, so that by arranging five such columns side by side of both sides of a paper tape […] it becomes possible to present one hundred thousand words, the length of an average book, on a tape slightly longer than forty inches.”[[7]](#endnote-8) By the 1920s micrographic equipment was routinely manufactured by the Eastman Kodak company, Rectigraph (later Xerox), and Remington Rand Corporation.[[8]](#endnote-9)

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Caption: Bradley Fiske, “Reading Machine,” United States US1411008A, filed November 20, 1920, and issued March 28, 1922.

In Brown’s *Readies*, we glimpse the gradual reshaping of the book, made possible by the storage capabilities of paper ribbons, glass plates, lenses, and rolls of celluloid. Once inseparable as a device and format, the book would gradually delaminate onto multiple surfaces: some supporting its habituated semantic coherence — a progression of pages — others extending it to include other modalities of reading, leafing, browsing, searching, and interpreting.

Electronic books came into being by multiple means, one of the earliest being a part of the PLATO (Programmed Logic for Automatic Teaching Operations), a computer controlled teaching system, implemented at the University of Illinois, Urbana in the 1960s. PLATO’s history as an educational tool and a proto-internet information sharing network is well explored by historians such as Joy Lisi Rankin, in her ground-breaking *People’s History of Computing in the United States* (Harvard University Press, 2018). Less known is PLATO’s original coinage of the term “electronic book,” consisting of a “bank of slides,” of the type usually “found in a textbook or in class notes,” but “prestored in an electronic slide selector” that could be “shared by all the students,” who were also able to “view same or different slides simultaneously […] by connecting electronically to the student’s television display.”[[9]](#endnote-10) The system was capable of storing 122 such slides, and to provide access to them in an arbitrary order in less than a microsecond.[[10]](#endnote-11) In a parallel development circa 1962, the US National Science Foundation announced “a new publishing program of electronic ‘books’ contained on magnetic tape” — note the quotation marks that indicate a certain unease with the functional transference between technological systems. Developed by Documentation, Inc., a Washington D.C. firm, these so-called “computexts” were meant to facilitate “high-speed computer searches in readable English.” “An Electronic Index to Chemical Patents” was to be the first title released to take advantage of that capability. “The electronic index will cover 150,000 patents issued over the last 17-years,” read the report, “the set of tapes covering this data can be contained in only one cubic foot of storage space.”[[11]](#endnote-12)

Computexts and PLATO electronic books were enabled by the simultaneous maturing of three technologies: magnetic tape storage, cathode ray tube (CRT) television, and the typewriter. As a storage medium, tape offered a number of advantages over its predecessors. It was, as the record has it, more portable than paper, punch cards, or celluloid. It lasted longer than other mechanized forms of storage, because electro-magnetic reading and writing devices made light contact with the tape — unlike, for example, punch-card systems, where the mechanism had to physically protrude through the media in order to be read or written. Unlike hole-punches or ink, magnetic polarities were easily reversible, making for a re-writable medium, in which errors of transcription could be immediately reversed. Magnetic tape had one major weakness however, in that it denied plain readability, electromagnetic inscription being invisible to the human eye. The increasing commercialization of CRT television displays in the 1960s made possible a restoration of human vision. Editing tapes directly with magnets or scissors was also obviously impractical. An instrument equivalent to a pen was needed to facilitate revision. Coupled with this system, a typewriter restored our tactile ability to edit stored inscription. In concert, tube, tape, and typewriter could approximate the affordances of ink and paper, creating a facsimile of page, and eventually a book.

By 1979, it was already possible to envisage a “portable, electronic viewing device” with ambitions “to replace presently existing books, magazines, microfilm, computer printouts and other printed media.”[[12]](#endnote-13) In his US Patent 4,159,417 David Rubincam proposed “an information storage and display apparatus […] having a memory, a [laser] sensor for sensing information from memory, logic circuitry operatively coupled with the sensor, and a display in operative relationship with the logic circuitry for visually displaying the information stored in memory” (Figure 2).[[13]](#endnote-14) The content of Rubincam’s electronic books was to be stored on holographic memory cards, one of which could store up to 200 Mbits of data, or approximately ten average-sized volumes in plain text — text without formatting or illustrations (Figure 3). The front of the device housed several interfaces: a variable speed page turner switch (labeled 70), a page number display (72), ten buttons by which a reader could enter specific pages (74), and several “fine tuning deflectors, in the event that the laser beam is not centered properly on the hologram.”[[14]](#endnote-15) This last detail shows us that Rubincam still thought of his holograms to stand in direct, one-to-one relationship to book pages. A physical movement over a holographic medium would therefore entail the corresponding movement on a displayed page. This analogical correspondence would later be severed on media that contained nothing resembling pages or paragraphs, but rather data structures, that could be reassembled into pages and paragraphs in the process of rendering the image.

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Caption: David Rubincam, “Electronic Book,” United States US4159417A, filed October 28, 1977, and issued June 26, 1979. The top illustration shows “a fragmentary plan view of the controls of an embodiment of the invention,” and the bottom a memory card containing a “plurality of holograms,” along with its protective case.

In the historically contingent agglomeration of these three specific technologies — screen, portable storage, and keyboard — we observe the development of a bridge-like structure, expanding to span the gap between media and human sensory organs. Where minds and ideas inhabit brains and bodies, inscriptions permeate a paper medium and increasingly occupy more remote physicalites such as solid state drives (SSDs) and liquid crystal displays (LCDs). Such disparate systems store information in radically divergent formats: the brain, as a lattice of connected neurons; books, in chapters and paragraphs; and SSDs in polarized configurations of floating gates. Despite these first-order material differences, we are able to recognize similarities across media in content conceived in abstracted second-order structural terms. Paragraphs in Virginia’s Wolf’s *To the Lighthouse* might be stored as a series of non-sequential, fragmented patches of data, and that in contrast to the orderly procession of paragraphs on a page. Second-order book sequences “take shape in the mind of the reader,” where “they are recreated and set up where the mind’s eye can rest on them,” the English critic Percy Lubbock wrote in frustration about the novel. An interpretive gaze necessarily falls on “certain fragments of the book which the author wrote,” he continued, “the rest of it having ceased to exist for us.”[[15]](#endnote-16) This “having ceased to exist” is literal, for the eye continually leaves a pile of discarded pages in its wake.

Lubbock struggled conceptually, as did later Carline Levine in her *Forms: Whole, Rhythm, Hierarchy, Network* (2015) because for them books indicated at once mental and physical structures or, rather, perhaps because for most literary scholars the work usually takes precedence over the object, making concerted materialism difficult if not impossible. Both *Craft of Fiction* (1921) and *Forms* therefore stopped just short of media studies. “If only there were one single tangible and measurable fact about the book,” Lubbock wrote, “if it could be weighed like a statute, say, or measured like a picture — it would support a world of shadows.”[[16]](#endnote-17) But the book does exist tangibly on paper and in mind, although in different formats. To traverse the two one need to disambiguate the meaning of the book in the sense of “a mental form,” from that in the sense of “a physical structure,” and further to attend to the dynamics of transposition between divergent media: hardware and wetware, inscription, instrument, and biology.

The traversal between such first- and second plus-order structures follows strict and often rigidly defined conventions, constituting the reification of thought into thing, or simply format. Consider the popular EPUB format, which has its roots in the Open Book™ Publication Structure (OEBPS). According to the Library of Congress records, the format was created in 1999 by the Open eBook Authoring Group, that consisted of “over 25 individuals from organizations participating in the Open eBook initiative, launched in October 1998 […] convened and facilitated by NIST (the National Institute of Standards and Technology.)” We learn also that the Authoring Group “included participants representing all aspects of the electronic publishing industry, and was open to any interested individual or organization.” The document begins with a statement of the group’s purpose and scope: “to provide a specification for representing the content of electronic books” and “to give content providers […] minimal and common guidelines which ensure fidelity, accuracy, accessibility, and presentation of electronic content over various electronic book platforms.”[[17]](#endnote-18)

The concern with “various electronic book platforms,” acknowledges the difficulty of describing document structure under the conditions where the exact dimensions of the medium are not known in advance. The Open Book could have been displayed on devices large and small, in full colour or monochrome, or on those devices providing “mainly audio or tactile interfaces.”[[18]](#endnote-19) The media agnostic nature of the format necessitated an abstracted style layer, expressed in HTML/XML and CSS markup schemas, which would describe textual elements such as footnotes and titles in relative terms such as left, right, top, bottom, or centre. In addition to these positional elements, the format specified social metadata, for example “creator” and “contributor” types, including subtypes such as annotator, book producer, collaborator, illustrator, printer, reviewer, sponsor, and translator among others.[[19]](#endnote-20)

The trademark symbol in the title of the standard, along with the copyright notice on its front page, undermine its emphasis on the open, participatory nature of the endeavour. The admixture of content, layout, and para-textual metadata further erodes the boundaries between strictly formal, content-based abstractions (chapter, paragraph, page) and social roles encoded into, although not apparent at the surface of the document. From the moment of its founding, the “open” ebook format embeds and is embedded within the North American copyright regime, in a way that would later allow “content creators,” “persons or corporate bodies” to police access to the “reading device,” “the physical platform (hardware and software) on which publications are rendered.”[[20]](#endnote-21) The reading platform emerges from this amalgam of text, technology, body, and social structure. Platforms facilitate the transition from thought to thing and therefore enters the realm of politics, being neither neutral nor a natural process. Because formats ultimately determine channels of access and distribution, they are negotiated and contested. Among the members of the EPUB working group we therefore find a preponderance of corporate representatives from Adobe, Apple, Barnes & Noble, Google, IBM, HarperCollins, Pearson, Penguin, Random House, Sharp, and Sony.

What does a format format then? Following the EPUB example, we observe a series of envelopments around the notion of content: the first semantic, by which ideational elements are ordered symbolically (a progression of chapters, for example); second, spatial, by which semantic units are laid out and oriented in space; third, technological, by which spatial units are rendered on a device; next, corporeal, by which a reader’s body can interface with the device; and finally the social — political, legal, and economic — by which surface contact between bodies and devices is negotiated. Formatting — mutual shaping — happens at each linkage in the long chain of transmediation between symbol and society. Where books can represent any number of such linked configurations, the book as a platform fixes a specific stack of symbolic, technological, and social commitments into a rigid chain. For example, we understand that Nintendo “the gaming platform” has something to do with Nintendo Co., Ltd., and that a “Nintendo game”, while under copyright, can only become a game on Nintendo-branded devices. Amazon Kindle and Adobe Digital Edition platforms strive for the same sort of vertical integration, even when the same work of art across platforms is still nominally called a book. Specific textual witnesses always diverge materially from the archetype text in publication, through printing error or editorial intervention. But, when fixed into a platform, they begin to diverge also in their “canned” interpretive capabilities: this book can be shared, and this one cannot; this one is available in China and this one was redacted; I can take notes there but not here.

Were telepathy real I would have liked to receive an author’s thoughts directly, as a message without mediation, but I cannot. I must reach through these mediating structures and not only decode — understand and interpret — the message (all operations at the symbolic level), but transform it materially back from paper shapes into brain shapes (operations at the level of the material). Given the stability of a medium, such as the book after Gutenberg press and before the internet, this process becomes naturalized and conventionally ignored. Our assumptions about hermeneutics — the art of interpretation — rest on habituated assumptions about print, assumptions that cannot be sustained in other media. Problematically for the reader of electronic books, the physics of computation rest in remote materialities — electromagnetic polarities and floating gate transistors — not immediately accessible to the human senses. Software engineers and user interface designers have dealt with this problem by simulating the affordances of a more familiar medium so as to rely on already habituated intuitions. “Our familiarity with the metaphors binds us to their nonrepresentational status,” Johanna Drucker wrote on the importance of reading interfaces for the PMLA.[[21]](#endnote-22) A reader of an electronic text may “scroll” or “flip” pages, in tacit understanding that such underlying motions involve neither scrolling nor flipping, but bitwise operations, the movement of liquid crystals and polar field effects.

The tactile property of pages guides the eye and the hand to pace the cadence of reading in real time. A reader’s ability to read quickly or slowly is similarly limited by the affordances of page turning. In reading for the plot, a reader can advance to its end in the manner that a video game player cannot when playing a video game. Some digital readers can be configured to page the book automatically, as Brown imagined it, and to measure the duration of the reading engagement in time units (three hours left in this book) rather than in pages (200 pages left). Obversely, a page format also affects the pacing of narrative, understood as a system of symbolic orders. Elements of a plot must, for all their variability, fit within a book. Such constraints are natural, arising from the material particularities of ink and paper — reading a soggy book in torrential storm conditions, for example, is ill-advised — while others are artificially and conventionally imposed, as is the case with page dimensions or the thickness of paper used in print. A container “fits” its content just as it casts the hand and eye into convenient grasping and gazing gestures. Further, at its outer edge, the imprint of a format becomes the organizing principle governing the configuration of larger epistemic structures in which it is embedded. In this way letters shape words, word shape paragraphs, paragraphs pages, pages books, books shelves, shelves stacks, stacks libraries, libraries the episteme and the world.

Interfaces determine the affordance of those actions that can be performed in concert between heterotopic systems. Amidst the universes of hand and fork possibilities, there lies a subset of actions available only to the combined set. It is not enough to say that a handle affords grasping, rather, it suggests convenient grasping in a specific way, and conversely, prevents other ways of grasping made inconvenient or impossible. An interface determines and governs through its affordances, by spatial arrangement, conforming the hand to the handle and the handle to the hand. In Drucker’s sharp idiom, interfaces “interpolate a user through disciplinary and scope regimes” and must be read as “spaces of individual and collective subject formation.” “Our notions of privacy, property, identity, and even individual voice and self,” she concludes, “are modified constantly in the exchange, bound to the cognitive modeling of experience through experience.”[[22]](#endnote-23) For media and otherwise archaeologists, an interface bares the traces of its usage. Knowing nothing about human hands, an alien visitor would reconstruct them by the shape of our household tools, input devices such as mice and joysticks, and our eating and writing implements. Further, the affordances of such artefacts would suggest their probable use: the difference between an axe and an adze, for example, necessitates distinct swinging motions, optimizing each for differing purposes — one for the cutting and the other for the carving of wood. But just as the difference in working edges leaves distinct tool-marks in wood, their orientation also exhorts a specific body posture. Formatting cuts both ways, in other words, constituting a mutual transposition of shared possibilities between hand, tool, and material.

The shape of a printed book similarly places a number of constraints on the human body, which include minimally sufficient visual acuity and manual dexterity. Other-abled bodies, those with severe hyperopia for example, must resort to assistive devices such as reading glasses or magnifying loupes. At the other side of the interface, the book also shapes content. Literary formats such as the novel or a short story define their measurements in relation to book objects, manufactured to conventional specifications. A novel will always be longer than a few pages and shorter than a million, and often at some average range between the possible extremes. Micro- or macroscopic novels are possible, but impractical. Such objects would violate the established techniques of access, storage, and distribution of books, optimized to the equilibrium of convention.

In the late 1980s, a group of designers and engineers at Apple in collaboration with Grolier Electronic Publishing were among those who turned to storytelling as formal means by which the alien physicality’s of a personal computer could be made more relatable for the general public. The result of this multi-year project was *Guides*, an attempt to reimagine an encyclopedia of North American history for young adults. Physically, its “delivery system” consisted of an Apple Macintosh Plus (SE or II), with one megabyte of memory, “combined with a standard CD-ROM drive and running Apple’s HyperCard software.”[[23]](#endnote-24) HyperCards were Apple’s interface metaphor for a relational database, and an evocation of a new medium — billed as hypermedia in corporate parlance and “programming for poets” — no longer constrained by its analogy with print. A card could hold any type of information: text, sound, or video. Like an index card, it could be stacked in any number of arbitrary configurations, shuffled, labelled, or cross-referenced.[[24]](#endnote-25) On a Macintosh Plus, a HyperCard occupied the entirety of the screen, nine inches diagonally at 72 dots per inch resolution.[[25]](#endnote-26)

Apple, more so than other companies, understood that neither screens nor relational databases were very approachable ideas for their target audience of home computer users. Programming poets therefore turned to narrative theory to design interfaces that relied on familiar story tropes. Brenda Laurel, who joined the Guides project shortly after completing her dissertation on a “computer-based interactive fantasy system,” wrote: “In the Guides project, the typical spatial metaphor employed in most hypertext or hypermedia databases is replaced by the notion of information, not as a space, but as *a series of events unfolding over time*,” or, in other words, a narrative.[[26]](#endnote-27) “Narrative includes both the story being told (content) and the conditions of its telling (structure and context,” another member of team explained: “Interface designers can adopt strategies from narrative theory, such as including multiple representations of events and information, or using characters as a means of representing material with an explicitly acknowledged points of view.”[[27]](#endnote-28) The guide personalities for the encyclopedia were in reality several faceted “topical keys,” or labels, “created by the editors for classifying the articles within the database.[[28]](#endnote-29) A taxonomic, epistemological formation in a catalogue of articles was therefore grouped under several available personalities, such as settler, sea captain, scout, inventor, slave, and Indian.”Information always reflects something about its source and its purpose," Laurel wrote. It is a “made thing, influenced by its efficient, formal, material, and end causes.”[[29]](#endnote-30) A point of view, however archetypical, could thus de-center the seemingly universal epistemological claims to objectivity implicit in the notion of a technical database.

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Caption: “The specification of individual guides was achieved by using the topical keys created by the editors for classifying the articles within the database” (7). From Gitta Salomon,Tim Oren, and Kristee Kreitman, “Using Guides to Explore Multimedia Databases,” in *Proceedings of the Twenty-Second Annual Hawaii International Conference on System Sciences. Volume IV: Emerging Technologies and Applications Track* (1989): 12.

Laudable as these design goals were for undermining a singular, heroic narrative of American settler colonialism, they came at the cost of another deterritorialization. Material contexts of electromagnetic storage, difficult to traverse even for experienced software engineers, were elided in favor of successively nested metaphors. First, a database, in itself a logical structure meant to simplify tedious data manipulations in computer memory. Second, the HyperCard, which encased database abstractions within the more familiar language of office supplies, cards, decks, and stacks. And finally, in a yet another metaphorical envelopment, HyperCards were represented in terms of anthropomorphic system agents that appeared in the guise of historical actors. The chain of mediation between reader and inscription was lengthened throughout, substituting material contexts for the metaphorical. Such nested metaphors underpinning the new encyclopedia of American history created a hierarchy of readers, whose most numerous members were also the least trusted to affect the material conditions of their interpretive activity.

My reading of Woolf’s *To the Lighthouse* on Amazon Kindle today is similarly circumscribed. The Kindle platform encompasses a number of similar devices, a piece of software on my mobile phone, an online application, and a file format, extending the EPUB standard to include stronger, cryptographic assurances against unauthorized use. It is ultimately a marketplace that extracts value from the distribution of goods, including those such as *To the Lighthouse* already in the public domain. A screen overlay called “About This Book” greets the reader on opening the volume. Here, I learn the novel received four stars on average by 470 readers. and that most readers finish the novel in 3 hours and 17 minutes. I am given the option to “follow” Virginia Woolf in order to receive new release alerts along with “occasional announcements.”[[30]](#endnote-31) I learn also that 583 passages in the novel were highlighted 5,848 times by other fans of the author. Among the most popular, is one at location 114 of 2762 on my device (there are no page numbers on this version of the book): “It seemed to her such nonsense — inventing differences, when people, heaven knows, where different enough without that.” My edition is published by Feedbooks, a “cloud” publisher specializing in re-printing digital works in the public domain.[[31]](#endnote-32) The Amazon Kindle application keeps track of and synchronizes my reading activity across multiple devices. I am reminded that *To the Lighthouse* is also available as an audiobook narrated by Juliet Stevenson. Sponsored Products Related to this Item include *The Dirty Parts of the Bible*, a novel by Sam Torode; *Lizzy Bennet Ghost Hunter: A Pride and Prejudice Variation* by Jemma Thorne which promises “a haunted mystery mashup, sisterhood, magic, and a dash of romance”; and among others, *Murder by Elf and Robot: Death visits the theme park* by Greg Kerr, wherein “a private eye, and two Icelandic sisters, discover a crazed killer is living in the same little mansion with them.” Customers who bought this item also bought *Song of Solomon* by Toni Morrison, *Their Eyes Were Watching God* by Zora Neale Hurston; and among other classics, *Steering the Craft: A Twenty-First-Century Guide to Sailing the Sea of Story* by Ursula K. Le Guin.

Like Lubbock and Levine, I struggle to find my own critical bearings in relation to such densely winding and wound structure of inscription so circumscribed. To get to the novel, I followed a long chain of material transpositions — transcoding and transmediation — so remote and alien in fact, at the scale of electromagnetic and quantum phenomena, that such physical manipulations themselves were now presented to me in second, third, and n-plus order notational terms. What I observe on the screen of a contemporary electronic book is a facet of a complex and phantasmal shape, fractured across multiple surfaces, stored in varying formats, each affording divergent possibilities for interpretation depending on a reader’s placement and literal privileges of access to aspects of the structure. The electronic book before me is a novel, a device, a file format, a piece of software, a marketplace, a piece of glass, a tracking device, and a space for annotation.

This agglomeration of disparate components is unlikely to last in its present form. Because many parts of the book platform are proprietary, our libraries are not equipped to archive book platforms. Books written or purchased under the auspices of closed systems, may soon go the way of Atari Jaguar or Saga Dreamcast. Under the terms of the Digital Millennium Copyright Act, US Code Title 17, Chapter 12, Section 1201 scholars may be prohibited from “circumventing a technological measures that effectively control access to a work protected under this title.” Platform makers may by such legal means embed instruments of censorship or surveillance into cultural works, in a way that makes them physically resistant to interpretation or critique. Remarkably, we know less about the history of electronic publishing than we do about the medieval book. The era of desktop publishing for example, spurred on by advances in personal printing and page layout software, is almost entirely missing from the record.

The gaps in the schematic history of the electronic book I have outlined above may come into a greater focus by a more closer integration of vocabularies between the related fields of book history, textual criticism, philology, and media studies. A platform- and infrastructure-studies approach to book history would thicken the description of text as inscription suspended not only in its immediate substratum, paper or screen, but also within the broader scaffolding, spanning symbolic, technological, and social topographies. “Our field of play is the entire field of communication,” the editors of *Book History* wrote in their inaugural issue.[[32]](#endnote-33) This scholarly project remains essential in a democratic society, in which communication is increasingly facilitated by online platforms. Where Brown imagined books that circulate in “dainty little pillboxes,” books of the future may take other fantastical forms, including actual pills and other technologies of memory imprinting.[[33]](#endnote-34) Yet neither speed, nor efficacy, nor optogenetics, should obscure the mechanisms of mediation.

Despite what the popular highlights suggest, I would like to dwell rather on the sonic cadence of the waves in *To the Lighthouse*, which for Mrs. Ramsay usually provided “measured and soothing” affirmation, “a tattoo [!] to her thoughts,” in the background of daily experience. “But at other times,” Woolf writes, “this sound which had been obscured and concealed under the other sounds suddenly thundered hollow in her ears,” and “like a ghostly roll of drums, remorselessly beat the measure of life, made one think of the destruction of the island and its engulfment in the sea.”[[34]](#endnote-35) In moments such as these, I think of Woolf as a great theorist of elemental media, who points the way toward the study of technological engulfment.

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