For Kari M. Kraus
Who bears witness
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I hesitated
before untying the bow
that bound this book together.
—WILLIAM GIBSON, “AGRIPPA”

william gibson agrippa. Type this string into any search engine and you will get dozens of hits on the electronic text of a 300-line poem by the bestselling science fiction author. “Agrippa” is a complex and multifaceted work—ekphrastic, elegiac, and autobiographical, about family, memory, and loss. Its central image is that of the mechanism, a trope that manifests itself as a photograph album, a Kodak camera, a pistol, and a traffic light, as well as in less literal configurations.¹ Explore a little further and you will find that the text, which dates from 1992, was originally published on a computer disk that came packaged with a limited edition artist’s book with illustrations and etchings by Dennis Ashbaugh, also titled Agrippa. The pages of this book were supposedly treated with photosensitive chemicals that caused the images to gradually fade from view once opened and exposed to light; the electronic text of Gibson’s poem, meanwhile, was encrypted so as to allow only a single

¹. The best reading of “Agrippa” I know, particularly the poem’s central trope of the mechanism, is Alan Liu, The Laws of Cool: Knowledge Work and the Culture of Information (Chicago: Chicago University Press, 2004), 339–348. Liu compares the work to Wordsworth’s “Tintern Abbey” as a poem of authorial memory and autobiography, but with the serial discontinuity of the mechanism marking a major departure from a Romantic sensibility.
reading from the disk, the lines auto-scrolling up the screen and then gone forever—a 20-minute experience.

Of course the inevitable happened. Almost immediately, the text of Gibson’s poem was “cracked” by hackers and posted to the Internet where it has remained in circulation ever since. It is questionable, meanwhile, how many of the accompanying artist’s books were ever actually produced—certainly not the edition of 450 planned in the original sales prospectus. Gibson himself has claimed never to have seen a copy, despite the fact that he has apparently autographed one.2 Continue exploring the history of this strange but affecting literary artifact and every assumption about it, other than its immediate presence on the screen in front of you, is called into question. Was the text’s illicit dissemination online the point of the project from the very start, or did Gibson and the others originally imagine it as an irrevocably vanishing performance piece about the ephemeral nature of memory and media? Did the data on the disk truly employ an RSA encryption algorithm as was reported, a technology classified as a munition by the National Security Agency? (If so, it would have been all but impossible to crack for anyone without the aid of a supercomputer.) Is the text of the poem on the Internet even the same as the one that was on the disk? (Early press releases about the project had more consistently described it as a short story or even a novel.) What is certain is that in Gibson’s “Agrippa” we have an electronic text that is volatile and ephemeral by design, which nonetheless turns out to be one of the most persistent and available literary artifacts on the Web.

The artist’s book Agrippa is more elusive—far fewer people have seen a copy in person. It comes in a literal black box, a glossy onyx-hued receptacle made of fiberglass that supports the book in a nest of webbing and corrugated

2. The copy at the New York Public Library (which I have inspected) is signed by Ashbaugh and Gibson on the flyleaf. In a February 2000 interview for the online Ain’t It Cool News Gibson says the following: “[I]t’s kind of an interesting question today as to whether or not any of these were ever really made. I don’t have one—I’ve seen a photograph of one which I suspect to be either a forgery or a kind of dummy prototype that these guys in New York produced, and I don’t know which.” See http://www.aint-it-cool-news.com/display.cgi?id=5140. Scott Rettberg notes: “I had the chance to meet Ashbaugh a few years back. He told me that during the time shortly after the book was published, he and Gibson were suddenly inundated with requests for interviews, so many, he said, that they felt compelled to give each interviewer a different story about the project. Some of the stories were true.” Online comment, http://www.otal.umd.edu/~mgk/blog/archives/000804.html#4147.
cardboard. The cloth-covered linen boards of the volume, distressed and artificially aged by burn marks, in turn embed a floppy diskette containing the poem in a depression that has been hand-cut into the last fifteen or so ragged-edged leaves, laminated together to create a shallow well. The interior of the book includes some forty-four pages printed in double columns with the lines of a nucleic acid quartet, a strand of DNA from (as it turns out) the bicoid maternal morphogen of the Drosophila or fruit fly; the diskette, meanwhile, contains the electromagnetically encoded text of the poem sheathed within its generic black plastic envelope. (Both serve to make Agrippa an early form of what we today call “codework.”) As one turns the pages, the drawings, some printed with uncured photocopy toner, rub and smear—a book that cannot help but be remade in the act of reading.

We will seek to open many black boxes in the pages that follow. In late 2001, stories began circulating that a German firm specializing in data recovery was using experimental laser scanning techniques to extract data from hard drives salvaged from the ruins of the World Trade Center. Hard drives are black boxes, functionally as well as figuratively—shielded from trauma and sealed against external contaminants. Such precautions are essential because in the nanoscale interval between the drive’s floating read/write head and the surface of the platter even a dust particle would loom as large as a boulder and a collision with a foreign object would send the head careening across the surface of the disk like a meteor gouging terra firma with its scorching impact. Apparently a suspicious spike in credit card transactions routed through computer systems in the WTC had been detected just prior to the planes striking the towers on the morning of September 11; investigators

3. Peter Schwenger begins his excellent essay on the book by intoning, “Black box recovered from some unspecified disaster.” See “Agrippa, or the Apocalyptic Book,” South Atlantic Quarterly 92, no. 4 (Fall 1993): 617–626. My description refers to the so-called Deluxe edition of Agrippa; the book was also printed in a more vanilla “small” edition, though this was apparently cancelled with few copies finished. For more on the different editions, see James J. Hodge, “Bibliographic Description of Agrippa,” The Agrippa Files, http://agrippa.english.ucsb.edu/hodge-james-bibliographic-description-of-agrippa-commissioned-for-the-agrippa-files.


hoped that tracing the source of those transactions might lead to persons with advance knowledge of the attacks. While the story died along with many other post-9/11 conspiracy theories and wild goose chases, the techniques behind the data recovery were real. The German firm, Convar, maintains an image gallery of salvaged WTC hard drives in their press release area: they bear the marks of unimaginable stress and duress, scorched, scraped, and caked with primal grit and grime.6 According to company executive Peter Henschel, “The fine dust that was everywhere in the area got pressed under high pressure into the drives. But we’ve still been able to retrieve 100 percent of the data on most of the drives we’ve received.”7 Clients were reportedly paying up to $30,000 to have their data restored. Thus the cold truth of modern data storage: given sufficient resources—that is, elite technical and financial backing—data can be recovered from media even under the most extraordinary conditions. This is a function not only of the hard drive’s carapace-like shell (not unlike an aircraft’s flight data recorder), but also the physical properties of the magnetic substrate in which data is embedded. (The technical term for the persistence of a magnetic recording over time is *hysteresis.*)8

These two episodes were my starting points in thinking about this book. Taken together they dramatize the complex nature of transmission and inscription in digital settings. On the one hand we have “Agrippa,” an electronic text that must contend not only with its notoriously fragile digital pedigree, but which was actually intended to disappear from sight, yet is one of the most stable and accessible electronic objects I know. On the other hand is the extreme physical trauma of the World Trade Center collapse, yet electronic data emerges intact from its ruins. Both of these occurrences and their seemingly counterintuitive outcomes suggested to me that our current theories and points of reference for reckoning with electronic textuality were inadequate when parsed against what I had come to understand as the material matrix governing writing and inscription in all forms: erasure, variability,  

7. Quoted in Kirschbaum, “German Firm Probes.”  
8. *Hysteresis* is defined by *Webster’s Seventh New Collegiate Dictionary* as “a retardation of the effect when the forces acting upon a body are changed (as if from viscosity or internal friction); *ep*: a lagging in the values of resulting magnetization in a magnetic material (as iron) due to a changing magnetizing force.” See http://www.lassp.cornell.edu/sethna/hysteresis/WhatIsHysteresis.html.

Preface
repeatability, and survivability. 9 Mechanisms is therefore a book about the textual and technical primitives of electronic writing and (by extension) other types of data recorded in electronic media.

In what follows, I have tried to write a different kind of book about electronic textuality, one that eschews top-heavy formalist or theoretical approaches to the medium and instead seeks to examine a number of specific digital writing technologies—and individual electronic objects—in their unique textual, technical, and imaginative milieu, thereby connecting to the new histories of inscription being written by such diverse critics as Friedrich Kittler, Lisa Gitelman, Bruce Clarke, Bruno Latour, Timothy Lenoir, Patricia Crain, and Adrian Johns.10 Mechanisms is therefore a study of new media, but one that takes its cues not only from the digital edge but also from fields like comparative media, bibliography, textual scholarship, and the history of the book, or “book studies” as Jonathan Rose now calls it: “The problem with focusing on texts is that no one can read a text—not until it is incarnated in the material form of a book.”11 We cannot effectively address questions of literary history or interpretation, Rose contends, “until we know how books (not


texts) have been created and reproduced, how books have been disseminated and read, how books have been preserved and destroyed.” Put another way then, “the computer” as a generic appellation is not adequate as a starting point for the kind of investigation of electronic writing I have in mind, any more than “the book,” conceived as a stable and unvarying form, suffices for serious students of earlier periods of textuality. Here we will follow the bits all the way down to the metal.12

A mechanism is both a product and a process, and making *Mechanisms*—making it work—has taken me from the New York Public Library, the Folger Shakespeare Library, and the Harry Ransom Humanities Research Center at the University of Texas at Austin to the Charles Babbage Institute in Minneapolis, the Nanomagnetics Group at the Laboratory for Physical Sciences at the University of Maryland, and the Department of Defense’s Cyber Crime Center, housed in an anonymous office park near Baltimore/Washington International airport. I have incurred a number of debts in this unexpectedly bilateral project, and it is my pleasure to acknowledge them here. Jonathan Auerbach, Kandice Chuh, Morris Eaves, Neil Fraistat, Lisa Gitelman, Katie King, Alan Liu, Bill Sherman, Martha Nell Smith, Catherine Stollar, and Noah Wardrip-Fruin all read large portions of the manuscript or read it in its entirety, and contributed important ideas. Nick Montfort deserves special mention and special thanks, not only for reading but for always being at the other end of an e-mail or an instant message and for first initiating me into the secrets of *Mystery House* over burritos in College Park. I am also indebted to my anonymous readers for the MIT Press, whose judicious suggestions and critique made the book that much better. Kevin Begos Jr., Michael Joyce, Patrick K. Kroupa (“Lord Digital”), and Alan Liu all intervened with critical data access at critical moments. Johanna Drucker, Neil Fraistat, Jerome McGann, Martha Nell Smith, and John Unsworth have each been there since the beginning or nearly so—I hope this book rewards their ongoing support of me in some small way. Professors Romel Gomez and Isaak Mayergoyz of the University of Maryland’s Department of Electrical and Computer Engineering

12. The book can thus also be understood as an attempt at platform studies, described by Ian Bogost and Nick Montfort as the critical investigation of “the relationships between the hardware and software design of computing systems and the creative works produced on those systems.” See http://platformstudies.com/.
patiently answered an English professor’s questions about magnetic recording and arranged for me to visit their labs. Peter Stallybrass and Rogier Chartier’s magnificent Technologies of Writing seminar, which I was privileged to attend at the Folger Shakespeare Library in spring 2005, became pivotal in my thinking about the project; my thanks to them, to my fellow students, and to the Folger for that opportunity. Supervisory Special Agent Jim Christy at the Department of Defense’s Cyber Crime Center, along with staff members Ryan Vella and Nancy Meyer, accommodated my visit to what may be the country’s premier computer forensics lab and shared what they could of their sensitive expertise. Virginia Bartow at the New York Public Library facilitated access to the NYPL’s copy of Agrippa, and Darrell Hyder at Sun Hill Press dug out his typesetter’s proofs for me. Elisabeth Kaplan of the Charles Babbage Institute at the University of Minnesota helped me make the most of a morning there. Catherine Stollar of the Harry Ransom Center at the University of Texas at Austin and Pat Galloway of the School of Information, faced with the daunting and unprecedented task of accessioning the 50 boxes of printed matter, 400 diskettes, and the odd laptop and whatnot of the Michael Joyce Papers, generously granted me complete access to the collection before it was publicly available. They both understood what I was after from the get-go, helped me navigate the material, and made my visit to Austin a success in every way. Thanks also to the outstanding staff of the Hazel H. Ransom Reading Room at HRC. My ultrawired graduate students at the University of Maryland keep me honest and keep me up to date: Jason Rhody, Tanya Clement, and Marc Ruppel each deserve special mention. Thanks also to everyone I work with or have worked with at the Maryland Institute for Technology in the Humanities (MITH), including Amit Kumar, Greg Lord, and Carl Stahmer. Despite the fine tunings of the many persons mentioned above, friction and flaws in Mechanisms are mine alone.

Versions of chapters were given as lectures and talks at the Washington Area Group for Print Culture Studies; the English departments of George Mason University, Miami University of Ohio, and the University of Minnesota; the University of Pennsylvania’s History of Material Texts Seminar; and the School of Information at the University of Texas at Austin, as well as at meetings of the Society for Textual Scholarship and the Modern Language Association. I am grateful to my hosts and to the audiences at all of these venues. A shorter version of chapter 2 appeared as “Extreme Inscription: Towards a Grammatology of the Hard Drive” in TEXT Technology: the Journal of Computer
Text Processing (vol. 13, no. 2, 2004: 95–125). Individual passages in chapter 4 and elsewhere in the book appeared in earlier form in “Editing the Interface: Textual Studies and First Generation Electronic Objects” in TEXT: An Interdisciplinary Annual of Textual Studies (vol. 14, 2002: 15–52). This article was itself a revision of an even earlier dissertation chapter, a chapter that was my first attempt to write seriously about the ideas in Mechanisms. A few pages from chapter 5 have been online since December 2005 at The Agrippa Files.13

In addition to individuals, Mechanisms has been supported by a number of entities and institutions. The Graduate Research Board of the University of Maryland got me started with a stipend in summer 2003; I was a Resident Fellow at the Maryland Institute for Technology in the Humanities in fall 2003. The National Endowment for the Humanities awarded me a fellowship at an absolutely critical juncture in spring 2005, taking a chance on a project that must have seemed at the limit of their charter. The College of Arts and Humanities at the University of Maryland helped support my travel to the Harry Ransom Center. My deep thanks to all of them. Much gratitude is due Doug Sery, my editor at the MIT Press, for his early and unflagging support of the entire project—Doug’s patience, attention, and goodwill are qualities for which I will always be supremely grateful.

Finally, I would like to express my appreciation to my parents Arlene and Mel, as well as the rest of my family and friends for their love and gentle distractions. My greatest debt of all, both personal and intellectual, is reflected—but not repaid—in the dedication.

A Note on Titles

The titles of both Agrippa and Afternoon, two works figuring prominently in this book, have been variously rendered by both their authors and by others. In the case of Agrippa, the situation is complicated by the work’s multifaceted ontology—there are distinctions to be made between the artist’s book, the poem, and the work as a conceptual whole. The title has often been capitalized (AGRIPPA), a practice originating with the original ASCII transcript of William Gibson’s text. I do not do so here, but have instead adopted the convention of using italics to indicate either the physical artist’s book Agrippa or

the total work—the book and the poem together—and quotation marks to single out “Agrippa,” the written text Gibson authored. I have not, however, altered the title of the work as it has been variously rendered by others when quoting from secondary sources. *Agrippa* is a collaboration between artist Dennis Ashbaugh, author William Gibson, and publisher Kevin Begos Jr.

In the case of *Afternoon: A Story*, Michael Joyce himself both does and does not capitalize the first letter of each of the three words in the title; I have elected to capitalize them here, in effect normalizing the title, but I have respected his and others’ variable local choices for purposes of quotation and citation. Likewise, Joyce has sometimes punctuated the title with a comma rather than a colon, and he has sometimes also imposed no punctuation at all. I have opted for the colon, except when quoting others verbatim.

**A Note on Wikipedia as a Scholarly Source of Record**

In several places this book references *Wikipedia* as a scholarly source of record, usually for some specific point of technical documentation. Information technology is among the most reliable content domains on *Wikipedia*, given the high interest of such topics among *Wikipedia’s* readership and the consequent scrutiny they tend to attract. Moreover, the ability to examine page histories on *Wikipedia* allows a user to recover the editorial record of a particular entry, with every revision to the text date- and time-stamped and versioned. Attention to these editorial histories can help users exercise sound judgment as to whether or not the information before them at any given moment is controversial, and I have availed myself of that functionality when deciding whether or not to rely on *Wikipedia*.

*Wikipedia* itself, whose developers leverage their software’s content modeling to expose document histories with a precision, transparency, and granularity unprecedented in printed publications outside the realm of genetic editions and textual scholarship, is a working example of the mechanisms I discuss herein.