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NOTES

Introduction

- 1 I will not necessarily note my references in this introduction—strategically, trusting the reader to discover my more scholarly allusions in the chapters themselves—unless my references are not cited elsewhere in the book.
- 2 I am concerned with linguistic ontology, in outlining this concept of grammalepsy, but I concentrate—in a manner consonant with a practitioner’s inclinations—on the production and reproduction of language rather than on what language is, in its fullness. Grammalepsy is, however, constituted by and characteristic of reading *by humans*. As I say below, symbolic parsing is not grammalepsis. And I agree with philosophers like Charles Taylor who ascribe to what Taylor calls a “constitutive” theory of language rather than those “designative” theories that are predominant, and particularly influential within the “regime of computation,” where linguistic practice may be considered reducible to calculation. The contrasting “constitutive” view proposes that language allows us to become more than whatever we were before we “have” it. Grammalepsy simply characterizes those moments when this takes place. See, in particular, the first chapter, “Designative and Constitutive Views,” in *The Language Animal: The Full Shape of the Human Linguistic Capacity* (Cambridge: The Belknap Press of Harvard University Press, 2016).
- 3 This is, perhaps, the place to mention that, outside the scope of this selection but in another not unrelated thread of discourse, I have written on related problems of translation and, in particular, the translation of process. John Cayley, “Digital *wen*: On the Digitization of Letter- and Character-Based Systems of Inscription,” in *Reading East Asian Writing: The Limits of Literary Theory*, ed. Michel Hockx and Ivo Smits, RoutledgeCurzon-IIAS Asian Studies Series (London: RoutledgeCurzon, 2003); “Beginning with ‘the Image’ in *How It Is* When Translating Certain Processes of Digital Language Art,” *Electronic Book Review* (2015); “Untranslatability and Readability,” *Critical Multilingualism Studies* 3, no. 1 (2015); “The Translation of Process,” *Amodern*, no. 8 (2018).
- 4 See: Matthew G. Kirschenbaum, *Track Changes: A Literary History of Word Processing* (Cambridge: The Belknap Press of Harvard University Press, 2016).
- 5 Andrew Michael Roberts, “Why Digital Literature Has Always Been ‘Beyond the Screen’,” in *Beyond the Screen: Transformations of Literary Structures, Interfaces and Genres*, ed. Peter Gendolla and Jörgen Schäfer, Media Upheavals (Bielefeld: Transcript, 2010), 162.

- 6 See, for example, Ivan Illich's discussion of the gaze and the icon, summing up the theories of John of Damascus (675–749), "an icon is a threshold. It is a threshold at which the artist prayerfully leaves some inkling of the glory that he has seen behind that threshold." *The Rivers North of the Future: The Testament of Ivan Illich as Told to David Cayley* (Toronto: Anansi, 2005), 114. I adapted this language for John Cayley, *Lens*, 2004.
- 7 See "At the End of Literature."
- 8 John Cayley, "Of Capta, Vectoralists, Reading and the Googlization of Universities," in *Digital Humanities and Digital Media: Conversations on Politics, Culture, Aesthetics, and Literacy*, ed. Roberto Simanowski (London: Open Humanities Press, 2016).

Chapter 1

- 1 These opening remarks, lightly edited, were composed for the republication of the 1996 essay in 2007.
- 2 I retain "literary" here in parentheses in deference to a persistent investment in "superior or lasting artistic merit" (*Oxford English Dictionary*), whereas serious contemporary critics of language practice in networked and programmable media may question the relevance of any "literary" categorizations. See, in particular, Sandy Baldwin, *The Internet Unconscious: On the Subject of Electronic Literature*, International Texts in Critical Media Aesthetics (New York: Bloomsbury Academic, 2015). In my more recent thinking, I bring the category into question for reasons of misdirected media specificity—because the affordances of digitalization undermine the predominance and privilege of the "letter" as what it is that we say we *read*. See, in this volume, "At the End of Literature."
- 3 "Serious hypertext" is a rubric of Boston's Eastgate Systems, one of the major, self-consciously literary publishers in the field, and developers of their own hypertext authoring software, "StorySpace." The Voyager Company has also made significant efforts to produce new work in new media as well as transpose appropriate content.
- 4 George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore and London: Johns Hopkins University Press, 1992). Landow published two further editions of this relatively popular and influential work for which he evoked the "versioning" paradigm of software and the regime of computation rather than that of the literary edition itself. Hypertext 2.0 came out in 1997 and 3.0 in 2006. Jay David Bolter, *Writing Space: The Computer, Hypertext, and the History of Writing* (Hillsdale, NJ: Erlbaum, 1991); George P. Landow, ed. *Hyper/Text/Theory* (Baltimore: Johns Hopkins University Press, 1994); Michael Joyce, *Of Two Minds: Hypertext Pedagogy and Poetics* (Ann Arbor: University of Michigan Press, 1995). And still of particular importance and relevance: Espen Aarseth, *Cybertext: Perspectives on Ergodic Literature* (Baltimore and London: Johns Hopkins University Press, 1997).

- 5 Posting, March 28, 1995, to the early internet discussion list, ht_lit. In 1995 this list had migrated to a server at Carleton University in Ottawa, Ontario, Canada, journal.biology.carleton.ca, and was moderated by K. M. Mennie. The list and its archive have been offline for some years but in 2017 I made contact with K. M. Mennie and initiated a plan to make an intrinsically searchable plain text archive of the discussions available in the Brown University Library's Brown Digital Repository at: <https://repository.library.brown.edu/studio/item/bdr:735315/>.
- 6 If only society and language use would agree with me, I would still now prefer to use the term "programmaton" for most uses of "computer."
- 7 Generalized non-linear poetics is one of the central concerns of the pioneering hypertext poet, Jim Rosenberg. See, for example, his introductory essay in Jim Rosenberg, *Intergrams* (Cambridge, MA: Eastgate Systems, 1993). This was published as part of *The Eastgate Quarterly Review of Hypertext*, Vol. 1, No. 1. Rosenberg also posted a draft discussion of these issues to the listerv ht_lit (see note 5), March 26, 1995. Espen Aarseth has placed hypertext within a broader theoretical framework. Aarseth, *Cybertext: Perspectives on Ergodic Literature* (See also note 5).
- 8 The Chinese writing system, in which characters correspond with single syllables, encourages the composition of associated periods with equal phonetic and graphic length, the elements of which may also correspond in terms of semantics and grammar. This is known as "parallelism" and, by definition and form, promotes non-linear reading. The figure is particularly marked in literary Chinese, especially classical poetry, where it may be required for certain verse forms.
- 9 Potential Literary Outlawry or PoLiOu was, potentially, one name for a broad range of experimental literary activities which are engaged with their own representation in cyberspace and with the particular capabilities offered by this new form of representation. Clearly, the name makes explicit acknowledgement to both the anticipatory plagiarisms and the anticipated antagonisms of the OuLiPo (See also note 28).
- 10 John Cayley, *Wine Flying* (London: Wellsweep, 1988). *wine flying* was first programmed on a BBC microcomputer in 1983–84. In 1988, it was ported to the Apple Macintosh and HyperCard and HyperTalk, the author's preferred development environment for this kind of work at the time.
- 11 The authoring framework referred to here, implemented in HyperCard and HyperTalk, was never published, although it was used for individual works such as *wine flying*. This points to the question of the cybertextual author's engagement in the creation of forms themselves and how this relates to the completed work. Most of the software forms I have made are intimately related to the corresponding finished works, but at the time of writing I could see clearly that—particularly in the case of non-generative work such as *Scoring the Spelt Air*—form could easily be detached from any specific content and rendered as instrument, tool, or compositional device.
- 12 The writer of the letter was Humphrey McFall, who it is a pleasure to acknowledge.
- 13 "Lexia" is a term adopted by George Landow from Roland Barthes to indicate the unit of text at either end of a hypertext link.

- 14 "I am on record as advocating taking hypertext into the fine structure of language, thereby fragmenting the lexia ...," "Notes toward a non-linear prosody of space," Jim Rosenberg, posting to the ht_lit discussion list (see note 5), March 26, 1995; or in a later posting elsewhere, "my own interest [is] in using hypertext to carry the infrastructure of language itself ..." October 28, 1995. And see also: Aarseth, *Cybertext: Perspectives on Ergodic Literature* (See also note 5).
- 15 John Cayley, *Indra's Net I* (London: Wellsweep, 1991–93). Details of the other publications in the series will be given as they are mentioned. All were HyperCard 2.x "stacks," published on disk or over the internet, for pre-OS X Macintosh computers only.
- 16 Kenneth Ch'en, *Buddhism in China: A Historical Survey*, 1st paperback ed. (Princeton, NJ: Princeton University Press, 1972), 317.
- 17 "But the fact that the mind itself has no internal necessity to determine its every act and compel it to suffer in helpless passivity—this is due to the slight swerve of the atoms at no determinate time or place." Lucretius, *The Nature of the Universe*, trans. R. E. Latham (Harmondsworth: Penguin, 1951), Book 2, 68. The swerve or "clinamen" of Lucretius is also a major reference point for the OuLiPo (see note 28), even though the workshop is, generally, suspicious of the aleatory.
- 18 See, especially, Emmett Williams, *A Valentine for Noël: Four Variations on a Scheme* (Stuttgart and London: Editions Hanjörg Mayer, 1973); *Selected Shorter Poems 1950–1970* (New York: New Directions, 1975). A selection of Jackson Mac Low's "Asymmetries" is included in: Jackson Mac Low, *Representative Works: 1938–1985* (New York: Roof Books, 1986). His "diastic" technique was used in: *The Virginia Woolf Poems* (Providence, RI: Burning Deck, 1985). See also note 21. Cage used mesostic techniques to compose *Roaratorio: An Irish Circus on Finnegans Wake* (1979), having already "written through" Joyce's work in 1978: John Cage and James Joyce, *Writing through Finnegans Wake*, University of Tulsa Monograph Series (Tulsa: University of Tulsa, 1978). They are also exemplified in John Cage, *I–VI*, The Charles Eliot Norton Lectures (Cambridge, MA: Harvard University Press, 1990). There is, especially in chapters 5 and 7, interesting discussion of these works in: Marjorie Perloff, *Radical Artifice: Writing Poetry in the Age of Media* (Chicago: University of Chicago Press, 1991). For a more comprehensive treatment of these and other precursors in the field of innovative poetics, refer to: Loss Pequeño Glazier, *Digital Poetics: The Making of E-Poetries* (Tuscaloosa: University of Alabama Press, 2002).
- 19 It would be interesting to make a catalogue of the precise varieties of *generative* acrostic and mesostic procedures, noting their differences, although this is far beyond our scope here.
- 20 This technique bears certain similarities to those developed by: Stefan Themerson, *On Semantic Poetry* (London: Gaberbocchus Press, 1975). Further details of a number of other potential and—in *Indra's Net*—as-yet-unrealized forms can be found in the explanatory material which is introductory to the pieces in *Indra's Net I–III*. These include further etymological and glossological holograms, phonemic holograms (these would generate a form of sound poetry), and morphemic holograms (which I will eventually explore since they would provide a way of engaging a language like Chinese).

- A commission for an installation at the Midland Arts Centre, Birmingham, that I received in 1996 allowed me to investigate mesostic transformations from original Irish to English translation (in another alphabetic script) and back again. The software was later published in the Indra's Net series as John Cayley, *Oisleánd: Indra's Net IX* (London: Wellsweep, 1996). See note 37.
- 21 This twenty-six-word form is similar to Williams's "ultimate poetry" except that in my strict form I try to make a twenty-six-word sentence or narrative (in the traditional order of the letters). An aspect of this form which I cannot resist mentioning is that once—like Williams, Mac Low, or myself—you have mapped the twenty-six letters of the alphabet onto twenty-six words, it is theoretically possible to encode all of literature acrostically or mesostically—translating everything into a "surface language" of twenty-six meaning-tokens (with no loss of information). Perhaps alphabetization was once perceived like this, as early scribes moved from away from morphemic script elements—as if "book" seemed to present itself as: "house + eye + eye + palm-of-the-hand."
 - 22 Oscar Pastior in his *Poempoes* (first German publication 1973) has a more poetic and less formalist approach to a similar self-referentiality: "holography ... to make a text as far as possible such that every part contains the whole. That is an image I hold in front of me." Oskar Pastior, *Poempoes*, Printed Head (London: Atlas Press, 1991). See also: *Many Glove Compartments: Selected Poems*, trans. Harry Mathews, Christopher Middleton, and Rosemarie Waldrop (Providence, RI: Burning Deck, 2001). Eduardo Kac is another early explorer of the application of holography to literature and vice versa. See his first "holopoem" (with Fernando Catta-Preta), *HOLO/OLHO* (1983), and his remarks in "Holopoetry and Fractal Holopoetry," *Holo/Olho (Holo/Eye)* ... is a combination of anagrams in which the word *holo* mirrors *olho* and vice-versa. The mirroring effect, however, was conceived so that fragments of the poem would contain enough letters to form the entire meaning: both *holo* and *eye*. The arrangement of letters in space was holographed five times; each hologram was fragmented and the five holograms were reassembled in a new visual unit. This holopoem was an attempt to recreate, in its own syntax, a structure that would correspond to the holographic model, according to which the information of the whole is contained in the part and vice-versa. Eduardo Kac, "Holopoetry and Fractal Holopoetry," *Leonardo* 22, no. 3 & 4 (1989): 399.
 - 23 John Cayley, *Collocations: Indra's Net II* (London: Wellsweep, 1993).
 - 24 *An Essay on the Golden Lion: Han-Shan in Indra's Net* (Edinburgh: Morning Star, 1995). See the discussion of *Golden Lion* below.
 - 25 *Under It All: Texts, Holography, Afterword* (London: The Many Press, 1993). This little book was published in an edition of 221 copies, each of which was unique. Four separately prepared pages bound into each copy consist of unique samples from two holographic transformations.
 - 26 As of this publication, I still have plans for an installation to project words onto mesostic planes, realized as a set of twenty-six transparent screens or planes arranged so as to suggest a large cubic word space. Read from its "front" through all of the twenty-six layers, fragments of a given text would be legible as the text was generated and projected words onto the planes. But moving around the cube, other mesostically determined orders of words would present themselves.

- 27 Here, a line of similar and in some respects, parallel work (which did not directly influence my own at the time) runs from the text-generation program “Travesty” by Joseph O’Rourke and Hugh Kenner, intersecting with Mac Low at the point of his *Merzgedichte*. Hugh Kenner and Joseph O’Rourke, “A Travesty Generator for Micros,” *Byte*, November 1984; Jackson Mac Low and Kurt Schwitters, *42 Merzgedichte in Memoriam Kurt Schwitters: February 1987–September 1989*, 1st ed. (Barrytown, NY: Station Hill, 1994). During the composition of his *Merzgedichte* in the late 1980s, Charles O. Hartman sent Mac Low several computer programs including “Diatext” and “Diatex4.” He also started to make use of Hugh Kenner and Joseph O’Rourke’s “pseudo-text-generating” program “Travesty” at about this time, to create some of the poems. However, “All outputs were subject to rule-guided editing” (sleeve notes for the audio CD, *Open Secrets* (New York: XI, Experimental Intermedia Foundation, n.d. [1994])). Most recently, such processes have been used in: Charles O. Hartman and Hugh Kenner, *Sentences*, 1st pbk. ed., New American Poetry Series (Los Angeles: Sun & Moon Press, 1995). “Travesty” is a text processor which, set to its higher “orders,” will produce results similar to those of my collocational procedures.
- 28 Mathews, a member of the OuLiPo, outlines his version of the procedure in: Harry Mathews, *20 Lines a Day*, 1st pbk. ed. (Normal, IL: Dalkey Archive Press, 1989). The OuLiPo, or Ouvroir de Littérature Potentiel, is clearly a basic reference point for cybertextual developments given the workshop’s profound and ludic investigations of the relationship between mathematics and literature, constrictive form, combinatory literature, etc. See, by way of introduction: Warren F. Motte, *Oulipo: A Primer of Potential Literature* (Lincoln: University of Nebraska Press, 1986); Harry Mathews and Alastair Brotchie, eds., *Oulipo Compendium* (London: Atlas Press, 1998). However, the OuLiPo has, at best, an ambiguous attitude to the aleatory as an aspect of generational, constrictive or combinatory procedure, despite the fact that the distinction between choice as chance and the choice of *arbitrary* formal constraints may be too nice to rule out the potential of one or the other.
- 29 John Cayley, *Moods & Conjunctions: Indra’s Net III* (London: Wellsweep, 1993–94).
- 30 *Golden Lion: Indra’s Net IV* (London: Wellsweep, 1994).
- 31 John Cayley and Gu Cheng, *Leaving the City: Indra’s Net V* (London: Wellsweep, 1995).
- 32 William S. Burroughs and Brion Gysin, *The Exterminator* (San Francisco: Auerhahn Press, 1960); Sinclair Beiles et al., *Minutes to Go* (Paris: Jean Fanchette, 1960).
- 33 John Cayley, *Book Unbound: Indra’s Net VI* (London: Wellsweep, 1995). *Book Unbound* has also been anthologized in a number of places, as follows: Cayley, John. “Book Unbound,” *Engaged*, 1995, On CD-ROM; Cayley, John. “Book Unbound,” *Postmodern Culture* 7, no. 3, Hypertext special issue (February 1997). <http://muse.jhu.edu/article/603711> (accessed August 13, 2017); “Book Unbound,” in *Dietsche Warande & Beaufort [Dwb]*, 4, on *Electronic (Visual) Literature*, ed. Eric Vos and Jan Baetens (1999); “Book Unbound,” in *The New Media Reader*, ed. Noah Wardrip-Fruin and Nick Montfort (Cambridge, MA: MIT Press, 2003).

- 34 *The Speaking Clock: Indra's Net VII* (London: Wellsweep, 1995). Extracts from the clock were also published as: Cayley, John. "From: The Speaking Clock," *Chain* 4 (1997): 25–27.
- 35 To quote from the given text: "Real time is concealed beneath the cyclical behavior of clock and time piece. No moment is like any other ... and yet the clock applies the same 'name' to many a different instance." *The Speaking Clock* affects to give a unique name to every moment.
- 36 See Jhave's website, <http://glia.ca> and David Jhave Johnston, *Aesthetic Animism: Digital Poetry's Ontological Implications* (Cambridge, MA: MIT Press, 2016).
- 37 *Oisleánd*, as a HyperCard stack, can be still be download from <http://programmatalogy.shadoof.net> and can also be viewed in a constrained, early web version on this site, <http://programmatalogy.shadoof.net/works/oil/oisleand.html>. This piece was commissioned for a touring exhibition, "Words Revealed," initially at the Midland Arts Centre, UK, May 11 to June 23, 1996. *windsound* has been performed and shown as a text movie in various venues and is also downloadable as a video from the "programmatalogy" site. Cayley, *Oisleánd: Indra's Net IX*; *windsound*, 1999; *windsound*, 2003. Electronic Literature Organization: *State of the Arts: The Proceedings of the Electronic Literature Organization's 2002 State of the Arts Symposium & 2001 Electronic Literature Awards*, included on the CD-ROM.
- 38 A severely cut-back, early versions of *noth's* appeared on the CD-ROM which accompanied an issue of *Performance Research* edited by Ric Allsopp and Scott deLahunta. *noth's*, 1999. *Performance Research*: 4.2, on CD-ROM. It was also published on the web as *noth's*, 1999a. *Riding the Meridian*. An initial performance version was shown at the Digital Arts and Culture (DAC) conference, Atlanta Georgia, October 28–31, 1999.
- 39 I owe this characterization in part to Espen Aarseth, who has developed a (media independent) "generalized model with a few broad categories that can describe the main differences of textual phenomena." In his excellent book already cited, Aarseth, *Cybertext: Perspectives on Ergodic Literature*. He argues convincingly for a distinction between cybertext and hypertext, putting forward the former as an inclusive term embracing, for example, indeterminate or reader-constructed texts, and reserving hypertext for (passively) linked structures of static lexia (textual nodes).

Chapter 2

- 1 Sections "THESIS," "ANTITHESIS," and "SYNTHESIS" of this chapter were software-generated by applying semi-aleatory collocational procedures to arguments manually edited out from the earlier sections. The two arguments might be summarized as: "The COMPUTER is (an integral part of) the SYSTEM against which WE write" (thesis), and "Software sHifts poetIcs, iF riTers prEss: <Reveal>" (antithesis). Sections "THESIS" and "ANTITHESIS" were generated from their respective arguments separately. A collocational algorithm generated phrases which were selected and collected by the author.

Selected phrases were also fed back into the given texts, changing them irreversibly. The altered texts from “THESIS” and “ANTITHESIS” were then combined and used as the given text for section “SYNTHESIS” (synthesis). Note that by this stage very little active selection of generated phrases was required by the author. The final paragraphs of section “SYNTHESIS” are almost entirely generated by the simple collocational algorithm. I merely split the generated paragraphs into lines.

A HyperCard stack (Macintosh only, for HyperCard 2.x) with “Reveal Code” cybertext generator was produced and published as John Cayley, *Pressing the <Reveal Code> Key: Indra’s Net VIII* (London: Wellsweep, 1996). An archive of this stack is still downloadable, without warranty, from <http://programmatology.shadoof.net>.

Section “<REVEALED>” is an extract of the actual working code (in HyperTalk) used to generate sections “THESIS,” “ANTITHESIS” and “SYNTHESIS.” The variable terms have been randomly and systematically replaced with substantive words from sections “The COMPUTER is (an integral part of) the SYSTEM against which WE write,” “INVARIANT inACCURATE SYSTEMS never sleep SYNCHRONICally,” “The COMPUTER is not (a part of) THE MEDIA. The COMPUTER allows for the COMPOSITION of an indeterminate number of potential MEDIA,” “FAMILIARITY breeds CONTEMPT. INTIMACY inspires MYSTIFICATION” and “Software sHifts poetIcs, iF riTers prEss: <Reveal>”—any noun or adjective is allowed to replace a variable name containing a value; any verb is allowed to replace a procedure or function name. HyperTalk “reserved words” have been left intact. The code is working code.

- 2 Perloff, 189.
- 3 Ibid.
- 4 Charles Bernstein, “Play It Again, Pac-Man,” *Postmodern Culture* 2, no. 1 (1991: n.p.). Cited by Perloff (perhaps in an earlier form) as: “Hot Circuits: A Video Arcade,” *American Museum of the Moving Image*, June 14–November 26, 1989.
- 5 Perloff, 188.
- 6 Perloff mentions this: *ibid.*, 208. However, Rosenberg has since pointed out that he wrote only the early programs. Andrew Culver then took over this work for Cage. (Personal communication.)
- 7 Jim Rosenberg, remarks posted to the internet discussion list *ht_lit*, June 9, 1995. See “Beyond Codexspace” note 5 above.

Chapter 3

- 1 Bolter; Gregory L. Ulmer, *Applied Grammatology: Post(E)-Pedagogy from Jacques Derrida to Joseph Beuys* (Baltimore: Johns Hopkins University Press, 1985); *Heuretics: The Logic of Invention* (Baltimore: Johns Hopkins University Press, 1994).
- 2 Aarseth, *Cybertext: Perspectives on Ergodic Literature*.

- 3 Theodor Holm Nelson, *Computer Lib / Dream Machines*, Revised and updated ed. (Redmond: Tempus Books of Microsoft Press, 1987); *Literary Machines 93.1* (Sausalito: Mindful Press, 1993).
- 4 When this text was first published, the poet, cris cheek [*sic*], provided a brief list of poetics “must-reads” for new media artists. I will provide his excellent references here, in this note. Kathy Acker, *Blood and Guts in High School* (New York: Grove Press, 1978); Steve Benson, *Blue Book* (Great Barrington: The Figures/Room, 1988); Brian Catling, *The Stumbling Block* (London: Book Works, 1990); Cayley, *Book Unbound: Indra’s Net VI*; Allen Fisher, *Defamiliarising* _____* (London: Veer Books, 2013); Robert Grenier, *Sentences*, 1st ed. (Cambridge: Whale Cloth Press, 1978); Mac Low, *Representative Works: 1938–1985*; Steve McCaffery, *Panopticon*, 1st ed. (Toronto: blewointmentpress, 1984); Jed Rasula and Steve McCaffery, eds., *Imagining Language: An Anthology* (Cambridge, MA: MIT Press, 1998); Tom Raworth, *Logbook* (Berkeley, CA: Poltroon Press, 1977); *Writing: [Poems]* (Berkeley, CA: Figures, 1982); Lisa Robertson, *Debbie: An Epic* (Vancouver: New Star Books, 1997); Jerome Rothenberg and Pierre Joris, eds., *Poems for the Millennium: The University of California Book of Modern and Postmodern Poetry, Vol. 2: From Postwar to Millennium* (Berkeley: University of California Press, 1998); Fiona Templeton, *You the City* (New York: Room Books, 1990); Hannah Weiner, *Spoke* (Los Angeles: Sun & Moon Press, 1984).
- 5 “Whether it has essential limits or not, the entire field covered by the cybernetic *program* will be the field of writing. If the theory of cybernetics is by itself to oust all metaphysical concepts-including the concepts of soul, of life, of value, of choice, of memory-which until recently served to separate the machine from man, it must conserve the notion of writing, trace, grammaè [written mark], or grapheme, until its own historico-metaphysical character is also exposed.” Jacques Derrida, *Of Grammatology*, trans. Gayatri Chakravorty Spivak, Corrected ed. (Baltimore and London: Johns Hopkins University Press, 1997), 9.

Chapter 4

- 1 Certain terms in this essay may require explanation. I prefer, despite its awkwardness and length, “writing in networked and programmable media” to any of the current words or phrases such as “hypertext, hyperfiction, hyperpoetry,” or the corresponding “cyber-” terms, although I do generally subscribe to Espen Aarseth’s “textonomy,” and would prefer cybertext to hypertext as the more inclusive, “catholic” term. Aarseth, *Cybertext: Perspectives on Ergodic Literature*. I use “programmatology” and “programmatological” by extension from “grammatology” and especially “applied grammatology” as elaborated by Gregory Ulmer. Ulmer. Programmatology may be thought of as the study and practice of writing (Derridean sense) with an explicit awareness of its relation to “programming” or prior writing in anticipation of performance, including the performance of reading. I try to avoid the use of words such as “computer” and prefer, wherever

possible, “programmaton” for the programmable systems which we use to compose and deliver “new media.”

- 2 This essay was originally sketched out for the “p0es1s: Poetics of digital text” symposion [*sic*], held in Erfurt, September 28–29, 2001.
- 3 Friedrich A. Kittler, “There Is No Software,” in *Literature Media Information Systems*, ed. John Johnston, Critical Voices in Art, Theory and Culture (Amsteldijk: G+B Arts International, 1997), 150.
- 4 There are times when I would like to write “code-as-text” and other times, “text-as-code,” occasionally with either term cycling (e.g., code-as-text-as-code) I will just use the one term, asking the reader to bear in mind the other possibilities in appropriate contexts.
- 5 As an example of the prevalence of code-as-text across the widest range of artistic inscription, a version of the code-as-text or reveal code aesthetic appears as something of a culmination in Lev Manovich’s excellent and provocative *The Language of New Media* (not discussed in the body of the present chapter because of my focus on textual and literal art practice). The final section of Manovich’s book is entitled “Cinema as Code” and features Vuk Cosic’s ASCII films, “which effectively stage one characteristic of computer-based moving images—their identity as computer code.” Manovich is undoubtedly correct when he asserts that, “What [George] Lucas hides, Cosic reveals. His ASCII films ‘perform’ the new status of media as digital data ... Thus, rather than erasing the image in favor of the code ... or hiding the code from us ... code and image coexist.” Nonetheless, it is worrying to be presented, in this highlighted context, with the example of work whose aesthetic may well prove to be exhausted by a conceptual and metacritical analysis (see below), particularly in a book which makes an unprecedented contribution to our understanding of new and emergent rhetorical strategies in new media (especially the crucial role of cinematic rhetoric), and represents a deep understanding of new media’s programmatological dimension. Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2001), 330–333.
- 6 N. Katherine Hayles, “Virtual Bodies and Flickering Signifiers,” in *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999), 29. An earlier version of this essay is also published as: “Virtual Bodies and Flickering Signifiers,” in *Electronic Culture: Technology and Visual Representation*, ed. Timothy Druckrey (New York: Aperture, 1996).
- 7 “Virtual Bodies and Flickering Signifiers,” 26.
- 8 “William Gibson (1948–),” *The Guardian*, July 22, 2008; Michael Cunningham, “The Virtual Tourist [a Short Interview with William Gibson],” *The Irish Times*, October 12, 1996.

In real life, Gibson is actually the opposite of hi-tech. He maintains a high degree of goofy aloofness from the technologies he writes about in such obsessive detail—almost as if just using them would increase the risk of being somehow “infected” by them. He wrote his most famous novel, *Neuromancer*, on a 1927 olive-green Hermes portable typewriter, and only recently migrated to a battered old Apple Mac.

- Gibson famously discussed his use of a typewriter in a phone interview for *Playboy*, August 30, 1996. "I do remember sitting with a blank sheet of paper and a typewriter going to 'dataspace' and 'infospace' and a couple of other clunkers, and then coming to 'cyberspace' thinking it sounds as though it means something." I have touched on the question of Gibson's and another influential contemporary novelist's apparently conservative approach to, shall we say, avant-garde practice in a relatively early online work, John Cayley, "Why Did People Make Things Like This?" *Electronic Book Review* (1997).
- 9 Hayles, "Virtual Bodies and Flickering Signifiers," 31. The immediately following quotations, interspersed with my comments, are from what I take to be a crucial paragraph in Hayles's crucial article.
 - 10 I mean "power" as used in the advertising and publicity for computer systems where, to relate the term with a more general or Foucauldian sense, we may think of it as the power to alter the behavior of a system (in an impressive manner or at great speed, etc.). See below.
 - 11 Florian Cramer, "Digital Code and Literary Text," *BeeHive Hypertext/Hypermedia Literary Journal* 4, no. 3 (2001). Also available through one of Cramer's websites at: http://www.netzliteratur.net/cramer/digital_code_and_literary_text.html (accessed July 31, 2017).
 - 12 In passing it is worth highlighting the interface itself, particularly the ever-evolving HCI, as a complex programmable object with a structure like a language, including, in some cases, an underlying textual command-line interface which mirrors the now-familiar mimetic and visual instantiation of users' interface. This is another point for potential artistic intervention as well as a vital consideration when discussing the emergent rhetorics of new media, as Manovich has demonstrated so well, even introducing the powerful concept of "cultural interface" (human-computer-culture interface) as an analytic tool. Manovich, 62–115.
 - 13 Cramer.
 - 14 Perloff, 189. For a separate but related discussion of some of these issues, see "Pressing the 'REVEAL CODE' Key" in this volume. The work of Emmett Williams and Jackson Mac Low, central to any assessment of the radical poetic artifice which she identifies, as also for the criticism of writing in networked and programmable media, is notable for its absence from Perloff's book.
 - 15 *Ibid.*, 188.
 - 16 As more writers from this tradition make the move into "new media," this position begins to change. They become "new media writers" "*digital poets*," and so on and attitudes perceptibly shift. Writers also, of course, become more sophisticated in their understanding of programmatological systems. This can be seen particularly in Charles Bernstein's subsequent writing on digital media and also, for example, in the work of Loss Pequeño Glazier, who is closely associated with the poetic practice which has developed from the L=A=N=G=U=A=G=E "school." See below, and: Glazier.
 - 17 The critical history of this (anti-)tradition in poetic literature is generally traced at least back to Mallarmé. A convenient source for its study can be found in the two-volume anthology: Jerome Rothenberg and Pierre Joris, eds., *Poems for the Millennium: The University of California Book of Modern*

- and Postmodern Poetry, Vol. 1: From Fin-de-Siècle to Negritude* (Berkeley: University of California Press, 1995); *Poems for the Millennium: The University of California Book of Modern and Postmodern Poetry, Vol. 2.*
- 18 The term is (ironic) OuLiPian, used of any prior instantiation of work generated by a procedure which has subsequently been invented and specified by the OuLiPo. Such a discussion is beyond the scope of this essay.
 - 19 See: Manovich, 94–115.
 - 20 The argument here is a rehearsal of the familiar but ever-important argument against art practice, particularly new media art practice, as media-specific or media-determined. Cramer's essay makes similar points.
 - 21 Roland Barthes, *S/Z*, trans. Richard Miller (Oxford: Blackwell Publishers, 1990); N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999), 46.
 - 22 Although I do not make use of his analysis in this essay, it is well-worth referring to Philippe Bootz's analysis of systems-mediated textuality, where I believe my "interface text" roughly corresponds to his "texte-à-voir." See: Philippe Bootz, "Le Point de Vue Fonctionnel: Point de Vue Tragique et Programme Pilote," *alire 10 / DOC(K)S Series 3*, no. 13/14/15/16 (1997).
 - 23 N. Katherine Hayles, "Bodies of Texts, Bodies of Subjects: Metaphoric Networks in New Media" (paper presented at the Digital Arts and Culture conference, Providence, RI, 2001). This is cited from the version of the paper posted in PDF form before the conference.
 - 24 Not "(yet)" as I say, although some might wish to try and make the strong case for an emergent machinic culture, which is, I believe, a serious project although a misdirection in this context.
 - 25 As in the term "Chinese Pidgin English." Cf., for example, the discussion in: Charles F. Hockett, *A Course in Modern Linguistics* (New York: Macmillan, 1958).
 - 26 Not exhausted in the examples given, as I say, but these remarks are, indeed, offered as a partial explanation of what is wanting in much less-considered and less well-made writing in networked and programmable media, where inadequate and inadequately theorized form substitutes for and sometimes positively evades content; when the writing is like poems about poetry (and nothing else), or techno-writing about technology.
 - 27 Alan Sonndheim, *Jennifer* (Salt Lake City: Nominative Press Collective, 1998).
 - 28 That is, it needs to be judged as such and should not necessarily be granted a special credit of affect or significance because of its instantiation in new media.
 - 29 Most recently in the book gathering many of these papers and essays, *Digital Poetics*, which, please note, includes a chapter devoted to "Coding Writing, Reading Code." Glazier's work has been done while he has also served as one of the motive forces and prime initiators of the major resource for innovative writing on the internet, the Electronic Poetry Center at the University of Buffalo, <http://epc.buffalo.edu>. Glazier.
 - 30 *Ibid.*, 31–32.
 - 31 See: "White-Faced Bromeliads on 20 Hectares," Electronic Poetry Center, <http://wings.buffalo.edu/epc/authors/glazier/java/costa1/00.html>. This work illustrates my specific points and also demonstrates that Glazier has been exploring the properly programmatological dimension of writing in networked

- and programmable media with, for example, kinetic and algorithmic texts. A classified selection of texts is at: <http://epc.buffalo.edu/authors/glazier/e-poetry/>.
- 32 Jodi is the very well-known, long-standing net.art project of Joan Heemskerk and Dirk Paesmans. Jodi, *www.jodi.org*, 1980. Jodi.
 - 33 The practice of composing ASCII symbols, usually displayed as monospaced fonts for regularity, in order to generate imagery. In Jodi's case this was abstract or verging on the abstract whereas, popularly, ASCII art has been figurative.
 - 34 See "Pressing the 'REVEAL CODE' Key" in this volume. The variable terms in this code were randomly and systematically replaced with substantive words from the text on which the procedure operates—any noun or adjective was allowed to replace a variable name containing a value; any verb replaced a procedure or function name. HyperTalk "reserved words" were left intact. The code is working code.
 - 35 But I raise it, in part, thanks to remarks by Nick Montfort which are published along with: John Cayley, "Literal Art: Neither Lines nor Pixels but Letters," in *First Person: New Media as Story, Performance, and Game*, ed. Noah Wardrip-Fruin and Pat Harrigan (Cambridge, MA: MIT Press, 2004); "Literal Art: Neither Lines nor Pixels but Letters," *Electronic Book Review* electropoetics (2004). As I was writing I came across Hugh Kenner's highly interesting reading of "Beckett Thinking." Kenner examines Beckett's writing in terms of strict, exhaustive logical procedure in an essay which includes paraphrases coded in the programming language Pascal. Hugh Kenner, *The Mechanic Muse* (Oxford: Oxford University Press, 1987), 85–105.
 - 36 Hayles, "Virtual Bodies and Flickering Signifiers," 33.

Chapter 5

- 1 Martin Heidegger, *Poetry, Language, Thought*, trans. Albert Hofstadter and ed. Harper Colophon (New York: Harper and Row, 1975), 115. In its web-based form (<http://programmatalogy.shadoof.net/works/hypercyberpoetext/hcp000.html>) and also as printed in *Assembling Alternatives: Reading Postmodern Poetries Transnationally*, there is a parallel "X" text based on an edited sequence from the same Heidegger piece, extracted from pp. 111 to 120. This text was collocationally transformed, using a procedure I have described elsewhere:

This transformation can proceed beginning with any word in the given text, which we then may call 'the word last chosen.' Any other word—occurring at any point in the base text—which follows (collocates with) the word last chosen may then follow it and so become in turn the word last chosen. // Clearly, in this type of transformation, at the very least, each pair of successive words are two-word segments of natural English. However, the text will wander within itself, branching at any point where a word that is repeated in the base text is chosen, and this will most often occur when common, grammatical words are encountered.

- (“Beyond Codexspace,” above, p. 25) In addition, words at the end of collocational jumps were, where possible, chosen to spell out the mesostic message (in bold) “what are poets for: technology calculation numbers.” This text is one possible rendition of a quasi-aleatory procedure which produces indeterminate results. It was not edited. Heidegger’s text is cited and subverted as, in this context, what tends to interpretation as an arch-conservative counter-current, one apotheosis of a perspective on “writing” which claims that, to come into being, it must transcend (even) its (traditional) technologies (see 2), and (the troubling, distasteful horizon of) technology itself.
- 2 See also the discussion of related issues in “Pressing the ‘REVEAL CODE’ Key” in this volume.
 - 3 “Beyond Codexspace,” above, p. 18.
 - 4 “Pressing the ‘REVEAL CODE’ Key,” above, p. 36.
 - 5 Bolter; Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology*; Hyper/Text/Theory; Joyce, *Of Two Minds: Hypertext Pedagogogy and Poetics*.
 - 6 Perhaps it would be clearer to use Barthes’s original terms, since the standard translation of scriptible, “writerly,” must also be understood as “reader-centered.” Barthes, *S/Z*, 3–6.
 - 7 “Intelligence is relentlessly reflexive, so that even the external tools that it uses to implement its workings become ‘internalized’, that is, part of its own reflexive process.” Walter J. Ong, *Orality and Literacy: The Technologizing of the Word*, ed. Terence Hawkes, New Accents (London: Routledge, 1982; repr., 1995), 78 ff., 81.
 - 8 See, in particular, Jim Rosenberg’s introductory essay to: Rosenberg, *Intergrams*. He has also posted a draft discussion of these issues to the ht_lit discussion list, March 26, 1995. See “Beyond Codexspace,” chapter 1, note 5 above. See also the discussions of non-linearity in this chapter’s note 5.
 - 9 Espen Aarseth has discussed a “cyborg aesthetics” of literature in: Aarseth, *Cybertext: Perspectives on Ergodic Literature*, 51 ff.
 - 10 See “Pressing the ‘REVEAL CODE’ Key,” above, p. 36. I pursue the programmer/writer relation briefly in “Of Programmatology,” also in this volume.
 - 11 For 22–23, I must acknowledge both the discussion of a “logic of [formal] exemplification” derived from Cage, in a paper presented at the “Assembling Alternatives” conference by Tyrus Miller “Paragram as participation: Anarchist poetics in John Cage and Jackson Mac Low,” and especially Joan Retallack’s challenge to this suggestion, namely her preference for the “experience of a possible form of life” in questions afterward.
 - 12 Aarseth has developed this in a number of places: Espen Aarseth, “Nonlinearity and Literary Theory,” in *Hyper/Text/Theory*, ed. George P. Landow (Baltimore: Johns Hopkins University Press, 1994); “Text, Hypertext or Cybertext: A Typology of Textual Modes Using Correspondence Analysis,” in *Research in Humanities Computing*, 5, ed. Giorgio Perissinotto, Susan Hockey, and Nancy Ide (Oxford: Oxford University Press, 1996); *Cybertext: Perspectives on Ergodic Literature*.
 - 13 MUDs (Multi-User Dungeons) and MOOs (MUD Object Orientated) are recast by Aarseth as Multi-User Discourses. Aarseth, *Cybertext: Perspectives on Ergodic Literature*, 142 ff. They represent what is perhaps the most radical form of textuality currently implemented beyond codexspace. Despite their

origins in game playing, these textual spaces require just the sort of analysis which Aarseth has pioneered, an analysis capable of treating them as “potential literature.” As a practical experiment, hypertext researchers at Brown University famously established “Hypertext Hotel,” a MOO space with explicitly literary inclinations (<https://elmcip.net/node/360>, accessed July 31, 2017).

- 14 Ibid., 179. Much as it concerns many of the questions raised, it is impossible to discuss ergodic art further within the scope of this chapter. It is an analytical concept well worth pursuing.
- 15 In her contribution to *Assembling Alternatives*, “In the Place of Writing,” Caroline Bergvall has made a strong case for “performance” as a model of practice bringing together innovative poetic engagements and cross-art experiments which invoke “non-literary” media or sites—contexts “contained by and *specifying the intertextual*” [Bergvall’s emphasis]. Performance is an intertextual (or hypertextual) path out of codexspace into anyspace. Performance (“to carry through in due form” OED) may also be seen as the realization or publication of writing and text-making, where the latter becomes more properly a “programming” (rhyming with the cybertechnical usage), a “pre-writing” or a “prior indication” of what and how to read. Bergvall hints at this, “each publication ... announces the text prior to our reading it, deciphers the text as we read it ... rewrites to an extent the text.” However, I am suggesting that the text here is itself the prior thing, the program, while any publication of the text and each subsequent reading in anyspace and by whomever, is a performance. Caroline Bergvall, “In the Place of Writing: The Performance of Writing as Sited Practice,” in *Assembling Alternatives: Reading Postmodern Poetries Transnationally*, ed. Romana Huk (Middletown, CT: Wesleyan University Press, 2003).
- 16 Here is a very short list of contemporary examples (with no attempt on my part at “catastrophic/judgmental interaction,” see 36). Linking is everywhere, especially on the World Wide Web but also in work distributed by pioneers of “serious, literary” hypertext such as Eastgate Systems in Cambridge, MA, publishers of Michael Joyce’s landmark hypertext *afternoon: A Story*, which employs the sophisticated local hypertext authoring software “StorySpace.” Michael Joyce, *afternoon: A Story* (Cambridge: Eastgate Systems, 1990). The work of Robert Kendall, for example, *A Life Set for Two*, exhibits transience (it is kinetic), conditional linking and user configuration. Robert Kendall, *A Life Set for Two* (Cambridge: Eastgate Systems, 1996). Jim Rosenberg’s *Intergrams* and *Barrier Frames* can only be read if the reader intervenes (it is ergodic in Aarseth’s sense), revealing tone-like clusters of word-“simultaneities” arranged in spatially represented, diagrammatic, syntactic relations. Rosenberg, *Intergrams; The Barrier Frames: Finality Crystal Shunt Curl Chant Quickening Giveaway Stare; Diffractions Through: Thirst Weep Ransack (Frailty) Veer Tide Elegy* (Cambridge, MA: Eastgate Systems, 1996). Charles O. Hartman has produced a body of generative, quasi-aleatory work, sometimes with other writers, including Jackson Mac Low and Hugh Kenner, accessible through his books: Hartman and Kenner; Charles O. Hartman, *Virtual Muse: Experiments in Computer Poetry* (Hanover: Wesleyan University Press, 1996). My own disk- and web-published *Indra’s Net* series, described (up to *Indra’s Net VII*) in “Beyond Codexspace” in this volume, exemplifies all the textual characteristics mentioned. As World Wide Web

works extend their abilities to processing as well as linking, they too will exhibit a wider range of cybertextual features, although aleatory linking or linking which is reader-determined is already a powerful, if anarchic, technology which can be easily exploited. Chris Funkhouser has documented and carefully analyzed much of the poetically inclined early work of this kind in: Christopher T. Funkhouser, *Prehistoric Digital Poetry: An Archaeology of Forms, 1959–1995* (Tuscaloosa: University of Alabama Press, 2007). He has since gone on to address corresponding work, made after the advent of the web: *New Directions in Digital Poetry*, ed. Francisco J. Ricardo, International Texts in Critical Media Aesthetics (New York: Continuum, 2012).

- 17 “Late age of print” is a much-discussed phrase originating with: Bolter.
- 18 The possible effect of the rise of audiovisual channels on the development of literary cybertext is also discussed in “Beyond Codexspace,” above.

Chapter 6

- 1 Joan Retallack, “Blue Notes on the Know Ledge,” in *The Poethical Wager* (Berkeley: University of California Press, 2003), 75–76.
- 2 Retallack is also noted as a scholar and student of John Cage, one of the most important artists to have contributed to the field of digitally mediated writing through his algorithmically generated mesostic texts.
- 3 Retallack is an example of such a writer, but not one of those who would resist a practical engagement with or appreciation of “new” media. For instances of the latter, see some of the discussions associated with: Joel Kuszai, ed. *Poetics@* (New York: Roof Books, 1999). In the course of these discussions, I wrote, “Some writing ... either could not exist in more ‘traditional’ media, or would not be so elegantly presented as it would in cyber / hypertext ... // In particular, I mean texts where ‘chance operations’ and/or algorithmic transformations are applied to given texts and the writer insists that the ‘real time’ results of these procedures *are* her inscription on the surface of a complex medium.” Ibid., 174–175. For resistance to this view, please refer to the proceeding and following contributions to the thread, within the book cited, especially those by Ron Silliman. My remarks here are a revisiting, reformulation, and development of related ideas and arguments.
- 4 This section is based on discussions in: John Cayley, “Bass Resonance,” *Mute*, January 2005; “Bass Resonance,” *Electronic Book Review* electropoetics (2005); “Lens: The Practice and Poetics of Writing in Immersive VR: A Case Study with Maquette,” *Leonardo Electronic Almanac* 14, no. 5–6 (2006): n.p.
- 5 Saul Bass was the first film title designer to be given a screen credit by the Director’s Guild of America (for Otto Preminger’s *Carmen Jones*, 1954).
- 6 Paratext generally could also be retheorized as complexity of writing surface. Graphic design elements and framing conventions create depth and structure time in and throughout the textual object.
- 7 One of the interesting aspects of Bass’s work is its non-use of Concrete poetics. One strand of literal art in new media clearly derives from Concrete traditions.

Note however, that I do not consider linguistic or textual objects that deploy the rhetoric of Concrete to produce complexity in the surface of writing as I am developing the concept here. In a sense, Concrete works because the properties and methods it brings together cannot share the same surface. This is the trope of Concrete: words are objects; words are not objects.

- 8 In his work on *West Side Story* (1961) Bass quietly and wittily played with real surfaces as a site for (title) writing, with the credits expressed as graffiti and intermixed with signage. One of the recognized artists in contemporary film titles, Kyle Cooper, literally etched or collaged the credits for *Se7en* (1995) onto film stock. In Bass's later work he reverted to the dominant mode of screen titling in which letters and words "float over" the visual world of the film on planes that are, conceptually, in an entirely different space, in contrast with that of the underlying photo-naturalism. This mode is also relatively familiar in new media work with language in the form of writing that is, basically, illustrated by visual and audio material rendered in new media. There is, as yet, little work that is consciously made for the complex writing surfaces made accessible by new media.
- 9 I am aware that, following Retallack and others, I am evoking some mathematical concepts in a rather vague and quasi-metaphorical sense. I am not pretending to use any of these terms with an informed understanding of their mathematical counterparts. But I would not like to preclude the possibility that this could be done, and that some of the procedures loosely described here could be given fairly precise representation in the mathematics of complexity and chaos, for example.
- 10 This analogy might be pursued since the mesostic procedure is also inherently recursive. The same mesostic process can be recursively applied to the generated text, as in Emmett Williams's "universal poetry."
- 11 John Cayley, *overboard*. 2003. Custom software, ambient poetics. <http://programmatology.shadoof.net/?overboard> (accessed August 1, 2017); John Cayley, *Translation*. 2004. <http://programmatology.shadoof.net/?translation> (accessed August 1, 2017). The principles and algorithms underlying *overboard* are set out in: John Cayley, "overboard: An Example of Ambient Time-Based Poetics in Digital Art," *dichtung-digital* 32 (2004). <http://www.dichtung-digital.de/2004/2/Cayley/index.htm> (accessed August 13, 2017).
- 12 I have pleasure in acknowledging and thanking Brown University's Literary Arts Program for the opportunity to work and direct research in the university's Cave during the spring of 2004 and 2005. In particular, I would like to thank Professor Robert Coover, who invited me to take part in the Program in this way. While at Brown I benefited from discussions and other interactions with, among others, Noah Wardrip-Fruin, Roberto Simanowski, Talan Memmott and Bill Seaman (at the neighboring Rhode Island School of Design). Dmitri Lemmerman was my main collaborator on the projects discussed here. Further discussion of work for the Cave—from which some of the following is derived—can be found in: "Lens: The Practice and Poetics of Writing in Immersive VR: A Case Study with Maquette."
- 13 The question arose as to why this phenomenon should be so immediately and effectively perceptible; and this is discussed in more detail, along with other aspects of the phenomenology of text in space more generally, in: *ibid*.

- 14 Cayley, *Lens*. I recommend reviewing the video documentation linked from the above web page or directly from: <http://programmatology.shadoof.net/?p=works/lens/lensComposite.html> (accessed August 4, 2017).

Chapter 7

- 1 N. Katherine Hayles, "Translating Media: Why We Should Rethink Textuality," *The Yale Journal of Criticism* 16, no. 2 (2003): 277, original emphasis.
- 2 Rita Raley, "Interferences: [Net.Writing] and the Practice of Codework," *Electronic Book Review* (2002): n.p.
- 3 "The Code Is Not the Text" in this volume.
- 4 Hayles, "Translating Media: Why We Should Rethink Textuality," *passim*, esp. 270–271.
- 5 *Ibid.*, 275.
- 6 *Ibid.*, 274. Emphasis in the original.
- 7 *Ibid.*, 276. Emphasis in the original.
- 8 *Ibid.*, 274.
- 9 "Virtual Bodies and Flickering Signifiers"; "Virtual Bodies and Flickering Signifiers." Discussed extensively in "The Code Is Not the Text" in this volume.
- 10 See "The Code Is Not the Text."
- 11 Raley.
- 12 *Ibid.*
- 13 Glazier. Code is addressed throughout Glazier's book but especially in the chapter "Coding Writing, Reading Code," 96–125.
- 14 An analysis and something of an apologia for Mez's work and theory is provided by: Raley. For more detail, see: "The Code Is Not the Text," above. Sandy Baldwin provides a critique of this earlier paper of mine and also explores a number of ways in which code may enhance the rhetoric of this kind of work, see: Sandy Baldwin, "Process Window: Code Work, Code Aesthetics, Code Poetics," in *Ergodic Poetry: A Special Section of the Cybertext Yearbook 2002*, ed. Loss Pequeño Glazier and John Cayley, Publications of the Research Centre for Contemporary Culture (Jyväskylä: University of Jyväskylä, 2003).
- 15 Cf. "The Code Is Not the Text."
- 16 The case for "brokenness" as a feature, not a bug, is made in: Baldwin, "Process Window: Code Work, Code Aesthetics, Code Poetics," 115.
- 17 See, again, "The Code Is Not the Text."
- 18 Barthes, *S/Z*. Discussed in: Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. In *S/Z* Barthes establishes a distinction between texts that are *readerly* and *writerly* texts, those that, respectively, invite interpretation and (re)construction by their reader/authors.
- 19 Gérard Genette, *Paratexts: Thresholds of Interpretation*, ed. Richard Macksey and Michael Sprinker, trans. Jane E. Lewin, 1st English ed., Literature, Culture, Theory (Cambridge: Cambridge University Press, 1997).

- 20 Raley. Memmott also refers to this practice as “puncturating” as discussed in: N. Katherine Hayles, *Writing Machines*, Mediawork (Cambridge, MA: MIT Press, 2002), 52.
- 21 For example, in: Sigmund Freud, “The Unconscious,” in *On Metapsychology: The Theory of Psychoanalysis*, ed. Angela Richards, The Penguin Freud Library (Harmondsworth: Penguin Books, 1991).
- 22 Here I am using “operator” in the mathematical sense. Elsewhere, I have translated this term more loosely, although more evocatively and metaphorically as “a class of operations.” Philippe Bootz, “Hypertext: Solution/Dissolution,” in *Ergodic Poetry: A Special Section of the Cybertext Yearbook 2002*, ed. Loss Pequeño Glazier and John Cayley, Publications of the Research Centre for Contemporary Culture (Jyväskylä: University of Jyväskylä, 2003), 80, translator’s note.
- 23 See the discussion of Nelsonian hypertext below, and refer to: *ibid.*
- 24 At the time I claimed that, when “turned inside out,” hypertext “links” were often “nilsk.” The as-yet-to-be-more-fully-answered question of “what is inside the link” in link-node hypertext, was often posed in the debates which raged over the long-quiet internet discussion lists. Please refer in particular to the archives of ht_lit. See “Beyond Codexspace” note 5 above.
- 25 Rosenberg, *Intergrams; The Barrier Frames: Finality Crystal Shunt Curl Chant Quickening Giveaway Stare; Diffractions Through: Thirst Weep Ransack (Frailty) Veer Tide Elegy*. *The Barrier Frames* lacks the characteristic diagram notation in the other Rosenberg pieces cited.
- 26 This characteristic of a Rosenberg text’s “transience” is one of the things that distinguish it in Espen Aarseth’s taxonomy of cybertext: Aarseth, *Cybertext: Perspectives on Ergodic Literature*.
- 27 In Ted Nelson’s scheme—outlined and discussed below—both flavors of reduction are represented: spatiality as “docuverse” and linearity as “permascroll.”
- 28 Philippe Bootz’s discussion of Rosenberg’s work has been influential on my own. Bootz, “Hypertext: Solution/Dissolution.” In the theoretical part of his paper he writes, “Surely here [as a (hyper)text is unfolded] we have an example of a poetic relationship with language. And this relationship is not established by the author or the reader, but by the device which transforms a global/structure/space into a local/action/temporality.” *Ibid.*, 63. When discussing Rosenberg’s work, this principle is exemplified, “He [Rosenberg] realized this [a move towards the instantiation of a more general theoretical position like Bootz’s] by putting forward what is mimetic hypertext, when seen from the point of view of its unfolding, while at the same time reconfiguring hypertext as the visualization of local processes.” *Ibid.*, 65.
- 29 In fact, of course, it would be preferable to establish a parent “Text” class that was less determinate as to its properties—particularly, for example, its temporal and ergodic properties—than our inherited and historically instituted “Text” object. The historical “Text” class would be redefined as extension of the more abstract parent. This situation, in which prior programming must be de-kludged or entirely rewritten in order to clarify structures and relationships is common in real-world programming.

- 30 Hayles also finds complexities of temporality represented by remediation, even through the relatively durable material substrate of print, especially in her discussion of Danielewski's *House of Leaves*. Hayles, *Writing Machines*, 115.
- 31 "It is not a question of a negation of time, of a cessation of time in a present or a simultaneity, but of a different structure, a different stratification of time." Jacques Derrida, "Freud and the Scene of Writing," in *Writing and Difference* (London: Routledge, 1978), 219. Further discussed in: John Cayley, "Inner Workings: Code and Representations of Interiority in New Media Poetics," *dichtung-digital* 29 (2003): n.p. This piece is based on a presentation at the "Language and Encoding" Conference, Buffalo, November, 2002, proceedings edited by Loss Pequeño Glazier.
- 32 Aarseth, *Cybertext: Perspectives on Ergodic Literature*.
- 33 The phrase "golden age" refers to a talk by Robert Coover given as a keynote address at the 1999 Digital Arts and Culture (DAC) Conference, Georgia Tech, Atlanta, and published as: Robert Coover, "Literary Hypertext: The Passing of the Golden Age," *Feed* (2000). (Also available at http://nickm.com/vox/golden_age.html.)
- 34 Two examples of hypertextual features that are non-standard on the web are conditional and two-way linking, both of which can be implemented with client- and/or server-side enhancements to HTML. Refer to the ACM SigWeb for an introduction to technical research on hypertext: <http://www.acm.org/sigweb>.
- 35 Nelson, *Literary Machines* 93.1, 2/17.
- 36 *Ibid.*, front cover.
- 37 *Ibid.*, 2/14.
- 38 Nelson introduced this term after the revised publication of *Literary Machines* 93.1. The terms are also used to bring the docuverse together with Nelson's idea for a radical restructuring of data in computing, ZigZag. "Permascroll" and related terms are defined in: Tuomas J. Lukka, "GZigZag Glossary," <http://www.nongnu.org/gzz/gl/gl-ns4.html>. See also: "GZigZag: A Platform for Cybertext Experiments," in *Cybertext Yearbook 2000*, ed. Markku Eskelinen and Raine Koskimaa, Publications of the Research Centre for Contemporary Culture (Jyväskylä: University of Jyväskylä, 2001); Nelson, Theodor Holm. "Zigzag." <http://xanadu.com/zigzag> (accessed August 13, 2017).
- 39 Bootz, "Hypertext: Solution/Dissolution."
- 40 Hayles, "Translating Media: Why We Should Rethink Textuality," *passim*.
- 41 This was clear from the discussion after Nelson's keynote talk at the Digital Arts and Culture conference, Brown University, Providence, RI, 2001, when he side-stepped the question of including some record or archive of text-generational programming on the permascroll.
- 42 These are only those features of Rosenberg's form that I want to highlight here. The diagram syntax he uses would also, for example, be difficult to represent.
- 43 As set out in: Aarseth, *Cybertext: Perspectives on Ergodic Literature*, 76–97.
- 44 Nelson, *Literary Machines* 93.1.
- 45 "Transcopyright" is neatly defined in: Lukka.
- 46 As in Hayles discussion of Danielewski: Hayles, *Writing Machines*, 115 ff.

- 47 In *Writing Machines*, *ibid.*, Hayles finds herself, perhaps, at the limits of this process, discussing works such as Tom Phillips' *A Humument* and Mark Danielewski's *House of Leaves*, that are literally print(ed.) without divorcing their manifestation of inherent textual properties: properties that can be represented but not *embodied* in print. These include the represented and remediated temporal complexities of *Leaves*; the *process and practice* of Phillips continuing to alter and prepare *A Humument*; in Talan Memmott's work the reader's ergodic process of revealing textual spaces. Talan Memmott's *Lexia to Perplexia* is a work that can be seriously discussed in "printed out" quotation, as Hayles demonstrates. As we have seen above, it is more difficult to bracket the simultaneities, for example, of a Rosenberg intergram. Hayles' criticism is crucial because it takes the institutions (especially those of literary criticism) to the edge of an abyss, as Edgar leads Gloucester to the cliff's edge in *King Lear*. Mark Z. Danielewski, *House of Leaves*, 2nd ed. (New York: Pantheon Books, 2000); Tom Phillips and W. H. Mallock, *A Humument: A Treated Victorian Novel*, 4th ed. (New York: Thames & Hudson, 2005); Talan Memmott, *From Lexia to Perplexia*, 2000. February. Originally by Trace; then *BeeHive Hypertext/Hypermedia Literary Journal*; then *The Electronic Literature Collection*, vol. 1 (2006).
- 48 For example, I discuss figures involving compilation and strict logical development at the end of "The Code Is Not the Text."
- 49 Rosenberg is also acutely aware of the necessity to bring programming into the scene of writing through institutions and tools. He addresses this in: Jim Rosenberg, "Questions About the Second Move," in *Ergodic Poetry: A Special Section of the Cybertext Yearbook 2002*, ed. Loss Pequeño Glazier and John Cayley, Publications of the Research Centre for Contemporary Culture (Jyväskylä: University of Jyväskylä, 2003). Specifically, Rosenberg wants tools that allow him to have working literary objects in progress on his computer desktop: notebooks, as it were, containing signifiers that retain their temporality and programmability in their native state. Note that the computer "desktop" and/or "platform" (and/or the "Web" which not so much of direct concern to Rosenberg) become varieties of metaphoric, if not actual, institutions here, authorizing and enabling the existence (or not) of particular objects with particular properties and methods.
- 50 Hayles, *Writing Machines*, 110.
- 51 Code and interiority are taken up in: Cayley, "Inner Workings: Code and Representations of Interiority in New Media Poetics."

Chapter 8

- 1 For me the unresolved locus classicus of this "problematic interplay" is still the "odd" or "singular" (*singulière*) materiality of the signifier with which Lacan distinguished the letter in his "Seminar on 'The Purloined Letter'" and Derrida's critique of this position's ideality in his "Le Facteur de la Vérité." Jacques Lacan, "Seminar on 'The Purloined Letter,'" in *Écrits: The First Complete Edition in*

English (New York and London: Norton, 2007); Jacques Derrida, “Le facteur de la vérité,” in *The Post Card* (Chicago: University of Chicago Press, 1987).

- 2 I aim to stand by such a statement of these circumstances despite the fact that they tend to be seen or recast in quite other terms, as a matter of contrastive ontologies, for example, as has been pointed out to me, in particular, by Francisco J. Ricardo, writing, in a comment on these sentences, “[A]rchitecture denotes a field of abstract study of physical structures, whereas language implies abstract study of abstract structures. Without the physical, architecture is incomplete; with the physical, language is overdetermined” (private communication, his emphasis). I have no trouble seeing it this way but prefer an inclination in relation to these problems that is engaged with the experiences of aesthetic practitioners and their addressees—how these agents live with(in) language and with(in) media. I pretend that we may learn less about how things are but more about how we may practice and live in our media-constituted diegetic worlds.

I note, in passing and as a matter of more or less subjective opinion, that critics and artists who adopt a more ontological approach find it more difficult, paradoxically, to distinguish, for example, the cultural significance and affect of “word” and “image.” Perhaps they may see a “pictorial turn” when presented with material in either language or pictorial representation. Perhaps they may claim, to quote a very recent example, “There is no aesthetic or ethical distinction between word and image.” Vanessa Place and Robert Fitterman, *Notes on Conceptualisms* (Brooklyn: Ugly Duckling Presse, 2009), 17. I aim only to examine how we may live and work differently in differing worlds.

- 3 A presentation of this chapter (then still in-progress) was also given to a workshop of the United Kingdom AHRC-funded “Poetry Beyond Text” project held at the University of Kent, Canterbury, May 9, 2009. A report of this workshop will be made available on the web and will be linked from <http://projects.beyondtext.ac.uk/poetrybeyondtext/> (accessed August 2, 2017).
- 4 It has been pointed out to me that the use of the word “world” in this context immediately invokes the seminal philosophical and art critical work of, in particular, Nelson Goodman, which I have briefly reviewed before writing this note. Nelson Goodman, *Ways of Worldmaking* (Indianapolis: Hackett Pub. Co., 1978). My usages and formulations here are, as already stated, chiefly those of a practitioner. Nonetheless I would be concerned not to contradict Goodman’s more far-reaching, analytical treatments of what is clearly related thinking. “World” in 3D graphics is a technical and functional term, a way of briefly referring to the algorithmically derived or modulated images of a particular system in its entirety. Such a system is, by definition, constituted by its media, and its diegesis is guaranteed by the underlying principles of 3D graphics. The media-constituted worlds of my own formulations are more complex than this, especially in terms of their relationship with cultural production, but they are perhaps only minor instances of “worldmaking” as analyzed by Goodman. Where I would engage with Goodman would be in terms of the manifolds of media-constituted worlds that I do assume in some sense generate any and all the worlds of media within which we happen to dwell.

- 5 W. J. T. Mitchell, "Metapictures," in *Picture Theory: Essays on Verbal and Visual Representation* (Chicago: University of Chicago Press, 1995); Michel Foucault, *This Is Not a Pipe* ["Ceci n'est pas une pipe"], trans. James Harkness (Berkeley: University of California Press, 2008); *Ceci n'est pas une pipe* (Montpellier: Éditions Fata Morgana, 1973). In Foucault trans. Harkness, the picture is erroneously referred to as dated 1926 and as bearing the famous caption as its title rather than the more usual, *La trahison des images*, 1929. David Sylvester et al., *René Magritte: Catalogue Raisonné*, 5 vols. (Houston and London: Menil Foundation; Philip Wilson Publishers, 1992), 1.331–2. CR 303.
- 6 This phrase is intended to invoke one of the better, published attempts to identify the specific and genuinely novel properties and methods of artistic practice in digital and new media, although it should be noted that the use of "language" here is in its now common extended figurative sense that approximates, in fact, to "rhetoric" and where the practices under discussion are rarely, if ever, poetic or literary per se. This is the "language" of the "linguistic turn" applied to mediated visual, performance and fine art practice. See: Manovich.
- 7 J. David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: MIT Press, 2000).
- 8 This argument is elaborated in: Cayley, "Lens: The Practice and Poetics of Writing in Immersive VR: A Case Study with Maquette."
- 9 Still today, for example, writing has authority if it is finished, printed, and published, although even in the academy there is a slow shift toward "if it could be printed then in *may* garner authority." If it is finished and inscribed in such a way that it *could be* printed out, then it may become subject to judgment even if this "printing out" never actually occurs (a thesis submitted on CD-ROM). Perhaps the *current* workings of these distinctions become clearest when we print (out) what is on a screen. The relationship to authorization is shown by the common requirement to print "etickets." What is on the screen is not a ticket until it is printed; it is not yet the authoritative representation of a transaction. We must still perform a number of rituals to make an eticket valid, usually including but not limited to its having been "printed out."
- 10 The apotheosis of this admittedly useful corrective for the field of digitally mediated literature is: Matthew G. Kirschenbaum, *Mechanisms: New Media and the Forensic Imagination* (Cambridge, MA: MIT Press, 2008). Although Kirschenbaum's book does an excellent job of describing and delineating the underlying materiality of computation in contemporary culture as well as situating this necessarily embodied practice historically, the book rarely achieves critical traction in relation to the instances of digital literature that it explicitly addresses, and I would argue that this is partly a function of the general misapprehension of the relationship between language and media that is explored in this chapter.
- 11 I am aware that my use of "media" in this context is somewhat unusual and may be problematic for some readers, especially for art historians and philosophers. Although I do not intend to conflate or confuse the notions of "medium" or "media" (as in art history's "mixed media") on the one hand, and the post-McLuhan usages of "media," I do want us to consider the cultural

practices of painting and their material supports as a system of media that is comprised, among other things, of media devices of various kinds, including paintings. This will, I hope, become clearer as my argument proceeds.

- 12 Notice how we prefer the metaphor of speech here. Somehow a picture would have trouble “writing.” This should probably be “seen” as one of the vestiges of logocentrism. Note that Mitchell entitles the section of his metapictures chapter that is devoted to *La trahison des images* “Talking Metapictures.” Mitchell, “Metapictures,” 64. My emphasis. Another recent example is the title of an *October* article, also briefly cited below: Harry Cooper, “Speak, Painting: Word and Device in Early Johns,” *October* 127 (2009): 49–76.
- 13 Just to be clear: I am speaking of *these*—after all quite typical, expository—words. I am fully aware, as should be obvious from the context, that certain words/instances of language call for specific media.
- 14 Foucault’s initial move, a consideration of the painting as calligram, would have run counter to the inclination I identify. But this was a misdirection, and he found himself unravelling (Harkness’ doubtful translation) or undoing (*le calligramme défait*) something that had never been made as such, as a calligram, that is. Foucault’s own discussion of the caption, the space between the image and word (see below), is the undoing of something that was never “done up” or “written out” in the first place. Foucault, *This Is Not a Pipe*, 28; Cooper, 57.
- 15 Roland Barthes, “The Photographic Message,” in *Image Music Text* (London: Fontana Press, 1977); “Rhetoric of the Image,” in *Image Music Text* (London: Fontana Press, 1977). Mitchell does not cite Barthes in his *Picture Theory* discussion of metapicture. He suggests later that Barthes’s analysis is chiefly at the service of “connections between semiotic structures and ideology,” whereas I find Barthes’s analysis pertinent to cultural practice. W. J. T. Mitchell, *Picture Theory: Essays on Verbal and Visual Representation* (Chicago: University of Chicago Press, 1995), 86n7.
- 16 Barthes, “The Photographic Message,” 17. Emphasis in original.
- 17 *Ibid.*, 29.
- 18 This relationship is also, of course, also often designated and theorized as indexical. See, *inter alia*, Rosalind E. Krauss, “Notes on the Index,” *October* 3–4 (1977): 68–81; 58–67. It is, moreover and by the way, less characterized by the imaginary—“‘magical’ fictional”—than even the relationship of cinema to the world due to photography’s strange, momentary and, crucially, past relation to human temporality. Barthes, “Rhetoric of the Image,” 45. As Barthes pointed out, the photograph is an index, not of “what is” but “what *was*” and/or what we could not have seen ourselves, and this makes it a new type of object in our diegetic worlds.

Later, in *Camera Lucida*—which is more about the relationship of “the Photograph” to a particular subject and to subjectivity as instituted by cultural practices—Barthes nonetheless goes so far as to say, “By nature, the Photograph (...) has something tautological about it: a pipe, here, is always and intractably a pipe.” [!] *Camera Lucida* [La Chambre Claire], trans. Richard Howard, First American paperback ed. (New York: Hill and Wang, 1982), 5.

- 19 Barthes, "Rhetoric of the Image," 45.
- 20 Ibid., 51.
- 21 Barthes, "The Photographic Message," 17. Emphasis in original.
- 22 Ibid.
- 23 Ibid., 18.
- 24 The phrase "syntagmatic 'flow'" is also from Barthes who uses diegesis in a sense that is close to my own as compared with the discourses of film and narrative. Barthes, "Rhetoric of the Image," 51. If symbolic elements can form a series that appear to be what Barthes calls "syntagm as nature" and I would say is a part of the same (media-constituted) world, then this establishes (coherent) diegesis. But for meaning to emerge, this circumstance also demands a fundamental break or "tear" (also in Barthes) that is a requisite of symbolic practice, of language in process. Barthes's thinking along these lines produces this superb and challenging final sentence to his "Rhetoric of the Image,"

Without wishing to infer too quickly from the image to semiology in general, one can nevertheless venture that the world of total meaning is torn internally (structurally) between system as culture and syntagm as nature: the works of mass communications all combine, through diverse and diversely successful dialectics, the fascination of nature, that of story, diegesis, syntagm, and the intelligibility of a culture, withdrawn into a few discontinuous symbols which men 'decline' in the shelter of their living speech. Ibid.

- 25 Barthes, "The Photographic Message," 18.
- 26 I am grateful to Francisco J. Ricardo for encouraging me to bring John Baldessari into this discussion. Doing so is particularly fortuitous in that Baldessari was an artist-curator/consultant for "Magritte and Contemporary Art," at the Los Angeles County Museum of Art November 19, 2006–March 4, 2007. Catalogue: Stephanie Barron and Michel Draguet, *Magritte and Contemporary Art: The Treachery of Images* (Los Angeles and Ghent: Los Angeles County Museum of Art; Ludion, 2006).
- 27 Examples can be consulted in: Coosje Van Bruggen, *John Baldessari* (New York: Rizzoli, 1990), 138–141. *Yellow (With Onlookers)*, 1986; *Bloody Sundae*, 1987; and *Three Red Paintings*, 1988.
- 28 For example: *Yellow Harmonica (With Turn)*, 1987. Reproduced in: *ibid.*, 161.
- 29 For example: The Dupress Series: Person Climbing Exterior Wall of Tall Building / Person on Ledge of Tall Building / Person on Girders of Unfinished Tall Building, 2003. Reproduced in: Marie de Brugerolle, *John Baldessari: From Life* (Nîmes and Paris: Carré d'Art_Musée d'art contemporain; École nationale supérieure des beaux-arts de Paris, 2005), 144–145.
- 30 As if to prove this, Magritte has also painted a version of his *Treachery* on an easel in a room where there also dwells another slightly more abstract, equally troublesome "pipe." *Les Deux mystères* (1966, Catalogue raisonné 1038) reproduced as plate 4 in: Foucault, *This Is Not a Pipe*.
- 31 Of course, it could be a "wall" and, in fact, the wall in the later painting, *Les Deux mystères*, against which a "pipe" is also suspended, is painted in a similar nondescript, all but textureless manner. This background, however, is determined as "wall" by the figurative "wooden floor" that abuts it. Yet even in this painting there is strong ambiguity as to whether its larger pipe is

- suspended from (how?), painted on, or floating within the so-called, so-painted “wall.” This relationship of all but purely notional “wall” to the projection-surface “walls” of the Cave is suggestive. Both instances of “wall” exist and, at the same time, do not exist for the purposes of poesis in their respective media.
- 32 Because, in the diegesis of the painting, it would be occluded by some measure of beige “fog.” Note that the term “fog” is a technical term in 3D graphics: “A rendering technique that can be used to simulate atmospheric effects such as haze, fog, and smog by fading object colors to a background color based on distance from the viewer, giving a depth cue.” David Shriener et al., *OpenGL Programming Guide: Fourth Edition: The Official Guide to Learning OpenGL, Version 1.4* (Boston: Addison-Wesley, 2004), 721.
- 33 I prefer to approach the issues that concern me directly through Foucault, but compare: Mitchell, *Picture Theory: Essays on Verbal and Visual Representation*, 70; Cooper, 56n15; 57. Both Mitchell and Cooper quote from the passages in Foucault that I discuss, although using Harkness’s translation unaltered, where its slight misdirections are less crucial to their arguments.
- 34 Foucault, *This Is Not a Pipe*, 28.
- 35 This is my own translation, modifying and improving Harkness. Cf. *Ceci n’est pas une pipe*, 34; *This Is Not a Pipe*, 28.
- 36 My own, slightly interpretative but careful translation of:

La petite bande mince, incolore et neutre qui, dans le dessin de Magritte sépare le texte et la figure, il faut y voir un creux, une région incertaine et brumeuse qui sépare maintenant la pipe flottant dans son ciel d’image, et le piétinement terrestre des mot défilant sur leur ligne successive. Encore est-ce trop de dire qu’il y a un vide ou une lacune: c’est plutôt une absence d’espace, un effacement de ‘lieu commun’ entre les signes de l’écriture et les lignes de l’image. *Ceci n’est pas une pipe*, 34.

- 37 Although I believe that the reader should be able to follow and visualize the work in my prose, an actual translation of *The Treachery* into immersive artificial 3D graphics for the Cave has been produced as a maquette, “*This Is (Not) Writing*,” and is available to download, along with previewing software that will render it (without immersion of course) on standard personal computers, from: <http://programmatology.shadoof.net/?notwriting> (accessed August 13, 2017).
- 38 For some readers, the conception of an object graphically distorted like this may evoke ostensibly parallel discussions of anamorphic images such as the well-known and often-discussed anamorphic skull in Holbein’s *The Ambassadors*. (This image recently adorned the cover of: Mark B. N. Hansen, *New Philosophy for New Media* [Cambridge, MA: MIT Press, 2006].) There might seem to be a similar problem concerning the point at which the distorted *image* ceases to be a representation of what it represents. However, in the first place the anamorphic transformation of the image is studied, deliberate, and enforces a break with the normal diegetic world of image-viewing. An out-of-the-ordinary point of view must be assumed in relation to the distorted image in order to see it as a normalized or construable optical representation. In the circumstances described in our thought experiment, the rotation of the objects is entirely regular, easy to describe, and in keeping with

the way that objects are viewed in space. Simply walking around the objects would produce the same effects. Moreover, in the case of linguistic material, the effacement of the representation is catastrophic rather than continuous. Neither is it entirely or even primarily a matter of judgment. There is a *necessary* relation between an inscription and the surface-that-is-no-surface. In our thought experiment, the pipe is in fact undergoing anamorphic processes of transformation—in 3D graphics terms—but these are transformations that we understand and construe in terms of the human optical experience of objects in space. It simply happens to be the case that there are few such experiences of inscription in “real-world” space. (A sign mounted so as to spin on a mast would be an example and note that, basically, such a sign is simply ignored except during those moments when it can be read.) In the artificial world of the Cave, it might be argued, for example, that if you rotate an inscription in front of a human point of view it “should” always simply look the same—or least remain readable—to that point of view (it appears *not* to rotate). In the system’s frame of reference, the inscription-as-object would be rotating, but it would obey the constraints of the phenomenology of inscriptions addressed to humans rather than that of optically rendered 3D objects. For certain of my earlier works in the Cave, I instituted such a “phenomenology” of letters in space (although without theorizing it in this way) in that I had all individual letters (my “atoms” of graphic inscription) rotate continuously to “face” the primary tracked point of view as it moved through the graphics world. From the phenomenologist’s point of view, this is a kludge, a workaround. Perhaps what we really require are linguistic objects that are always equally readable regardless of the position from which they are viewed and without their having, at least conceptually, to transform in any way—to rotate, translate, or scale—in order to maintain the properties of readability that they were given when they were inscribed.

- 39 In one interpretation that is also suggestive of the different ways in which language as inscription relates to media, this is simply a particularly stark and clear instance of a phenomenon originally pointed out to me by the historian of Chinese art, Robert Harrist. A *representation* of writing should not be readable. If it is readable then it is no longer a *representation* of writing, it *is* writing. See: Robert E. Harrist Jr., “*Book from the Sky* at Princeton: Reflections on Scale, Sense, and Sound,” in *Persistence | Transformation: Text as Image in the Art of Xu Bing*, ed. Jerome Silbergeld and Dora C. Y. Ching (Princeton, NJ: P. Y. and Kinmay W. Tang Center for East Asian Art, 2006), 35–37.

One can also see how catastrophic shifts back and forth from the representation of writing to writing itself would be likely to ally themselves with breaks in media-constituted diegesis if one thinks back to photography and imagines the photo-naturalistic depiction of a room containing a table strewn with sheets of writing that is “out of focus” in terms of depth of field. If the writing were, through some form of artifice, brought into focus, and assuming it was large enough to be readable, it would break both the diegesis of photo-naturalism while simultaneously and suddenly addressing us as writing.

- 40 In fact, of course, when we do this, we will be “seeing the object” projected on another surface which may also have a spectral background projected onto it.

Chapter 9

- 1 Throughout this chapter, I refer to the Google “corpus,” implicitly treating the inscribed text that is addressed by the Google indexing engines as if it were a body of material similar to or commensurate with other textual corpora such as might be compiled into a particular author’s corpus or the corpora put together and studied by corpus linguists such as the Brown Corpus, the Corpus of Contemporary American English, the British National Corpus, and the American National Corpus.
- 2 Whenever I use the word “with” in this context, my intention is to highlight the underlying, now chiefly archaic, sense of “against” that was once more active in the Anglo-Saxon preposition, although we do still both work and fight *with* others. This negative apotropaic inclination of “with” is preserved by contemporary English in words like “withhold,” “withdraw,” and “withstand.”
- 3 “Flarf,” the coinage attributed to Gary Sullivan, is a name for a practice of poetic writing. There exists a “Flarf(ist) Collective” of writers, mostly poets, who have exchanged and published work under its aegis. (See the Flarf feature in the excellent online *Jacket Magazine*, Jacket 30, July 2006, <http://jacketmagazine.com/30/index.shtml> [accessed August 2, 2017].) Wikipedia describes its aesthetic as “dedicated to the exploration of ‘the inappropriate’” (as of: February 16, 2011) and this seems right to me. It’s a significant poetic movement of the late twentieth, early twenty-first centuries for which, personally and critically, I have a high regard. However, Flarf is now also closely associated with methods of composition that make extensive use of internet searches engines since they are, clearly, well adapted for gathering large amounts of “inappropriate” linguistic material. The association is unfortunate since there are many, many other ways to explore the inappropriate and gather relevant exempla. The identification of Flarf with Google-mining is, itself, inappropriate Flarf. At this point in my argument, my aim is simply to contrast the Flarfist use of Google-as-grab-bag versus a sustained aesthetic engagement with the cultural vectors that Google both offers and denies. Engagement at the level of computation may be a key to making and maintaining this distinction.
- 4 Michel Eyquem de Montaigne, “Of the Institution and Education of Children,” in *Literary and Philosophical Essays: French, German and Italian*, The Harvard Classics (New York: P. F. Collier & Son Company, 1910).
- 5 European Science Foundation (ESF) workshop: “Neuroesthetics: When Art and the Brain Collide,” September 24–25, 2009, IULM, Milan, Italy.
- 6 Chrisley’s presentation at the conference was titled “A cognitive approach to the esthetic experience,” but his introduction of the “edge of chaos” was largely anecdotal, deriving from experiments with robotic cognition. Chrisley was then a Reader in Philosophy at the University of Sussex.

- 7 Markov models, processes, chains—named for the Russian mathematician, Andrey Markov (1856–1922)—provide formal descriptions for systems with a finite number of elements in successive states. Using such a model, we only have to know the relative frequency of the elements in a system in order to be able to generate further sequences of these elements, probabilistically, that will be, as it were, characteristic of the system. These models can be applied to language, taking any distinct linguistic element—letter, phoneme, syllable, word, phrase, etc.—as the units being considered. A sequence of n elements considered as a unit is known as an ngram or n-gram. A three-word phrase may be treated as an n-gram, and if we search for such a phrase, double-quoted, in Google, we get a “count” that can be used as a relative frequency for that phrase within the domain of the Google-indexed internet “corpus” of linguistic tokens. Refinements of such purely statistical language models are now proven to be remarkably powerful, and underlie, for example, much automated translation. The existence of the internet-as-corpus and its Google search boxes puts such linguistic modeling in the hands of everyone. Google and its rival service providers are aware of non-venal uses for this data. Recently there was a short, rather dismissive piece on the Google labs: Books Ngram Viewer (<http://ngrams.googlelabs.com/>) in the *London Review of Books*. Jenny Diski, “Short Cuts,” *London Review of Books* 33, no. 2 (2011: 20). A *Science* article is referred to that describes work underlying the Ngram viewer in more detail. Jean-Baptiste Michel et al., “Quantitative Analysis of Culture Using Millions of Digitized Books,” *Science* 331, no. 6014 (2011: 176–182). Another contextually relevant discussion of Markov chains can be found in: Noah Wardrip-Fruin, *Expressive Processing: Digital Fictions, Computer Games, and Software Studies* (Cambridge, MA: MIT Press, 2009), 203–205.
- 8 Apart from specifics discussed here, I will cite two sensational sociopolitical examples. First, there is Google’s dubiously or *unprincipled* accommodation of Chinese state censorship as a Chinese language news provider in February 2004, as an investor in the Chinese search site Baidu, by voluntarily blocking politically sensitive searches in January 2006, and its subsequent *purportedly* principled retreat from the Chinese search “market” in 2010. John Battelle, *The Search: How Google and Its Rivals Rewrote the Rules of Business and Transformed Our Culture*, updated with new chapter in this edition (New York: Portfolio, 2006); Bianca Bosker, “Google Shuts Down China Search, Redirects Users to Hong Kong,” *Huffington Post*, March 23, 2010, updated May 25, 2011; Jonathan Watts, “China’s Internet Crackdown Forced Google Retreat,” *The Guardian*, January 13, 2010. Second, there is the purported manipulation of the type-ahead suggestions provided by Google Instant. Bianca Bosker, “Google Instant Blocks Sexy Searches,” *Huffington Post*, September 9, 2010, updated May 25, 2011.
- 9 For one simple example, Microsoft’s *Bing* treats line endings differently. Line endings (e.g., carriage returns) don’t break sequences as they do for Google. For neither engine, however, is this a recognition of differences or distinctions that might be significant for poetics. The fact that we can be fairly certain that differential treatment of line endings is technical and *in the service of commerce* rather than poetic or, for example, rhetorical, speaks volumes

concerning Google as an engine of mis- or undirected culture formation. Its undoubtedly “powerful” forces are self-trammeled by concerns to which Google is strategically blind and to which we, as producers of culture with other motivations, seem already to have become blind. If we fail to start noticing these motivated distinctions now, it will soon be too late since they will cease to exist. In the ontology of software, if an object is not implemented, it cannot have instances.

A further note on line endings: It is interesting to remark that although line endings break word (or token) sequences in Google’s indexing of web pages—chiefly HTML or HTML-derived content—token sequences are *not* broken by corresponding punctuation or tagging when Google indexes the predominantly pdf-derived content of Google Books. This is simply one example of many conditions demonstrating that when you search these two domains, you search them differently with no explicit signal of this fact. The underlying software is taking away any care that you might have had for the way in which you are searching. If your relationship to the corpus is transactional and you understand the nature of the underlying contract, this is fine. My point is that now, when you search Google, you increasingly treat it as if you are searching all of inscribed culture. Once again, this is fine, if you realize what you are doing—research that is abbreviated, shorthand, provisional, or pragmatic for example—and yet after having qualified your understanding of the scope of the Google corpus, do you also take responsibility for your failure to know any details of the procedures by which it undertakes the search on your behalf, *how* that search addresses the corpus, the manner in which the results are delivered, and so on?

- 10 And ultimately or more accurately: whoever or whatever *owns* Google.
- 11 See below. Daniel C. Howe adds, “Of course Google automatically/procedurally indexes our pages/content, yet makes it illegal or at least, they would claim, a violation of their terms of service for us to do the same to them.”
- 12 Daniel C. Howe adds, “in tiny droplets,” that are regulated by: Google.
- 13 The fact that we accept—pragmatically, gratefully—Google’s indexing of the corpus represented by inscribed textuality on the internet is the sign, I believe, of an order-of-magnitude shift in the scale of the cultural archive and our engagement with it as humans. I provide brief remarks on these issues here, acutely aware that they deserve extensive and detailed consideration. In a sense the world and the “knowledge” or “culture” that is in it—call it “content”—has not and will not change. Human life is what it is. Nonetheless we tend to agree that our ability to archive this content in order to make it recordable and manipulable has radically changed during the modern period. Scholars of the age of Francis Bacon began to lose hold of any sense that they might read and thus know “everything.” In the maturity of print culture, we have long ago lost sight of being able to read or “know” everything in a particular discipline, let alone “everything” per se. However, we were wont to believe that all inscribed textuality might be collected in libraries or traditional archives and that, at the very least, a “union catalogue,” the product of human labor, would be able to give us access to any necessary article of knowledge, with universities curating and signaling the originality of purported

contributions to this sum of content. However, just as the efflorescence of print made it literally impossible to read everything, the explosion of content-creation that is enabled by programmable and networked media now makes it literally impossible for humans to *index* everything in their archives. Humans are already, now, not able to create a catalogue of the articles of culture that they have, collectively, created.

Instead, humans write software, processes that will index these archives. These processes will reflect human culture back to its maker-consumers and consumer-makers. This is already what Google does for us. At first it seemed that the company did this almost gratuitously, more or less as a function of Silicon Valley utopianism and naivety. Now this intensely, importantly cultural service is fundamentally skewed and twisted by commerce, by a requirement to generate advertising revenues that are dependent on the most advanced forms of capitalism. These circumstances may have been all but inevitable, but the time for decisions has come. What computational processes do we want to create and have running for us, in order to index or otherwise represent for us the contents of the cultures that we are making?

Especially in questions following her presentation, “Digital Archives: The Missing Context,” <http://www.brown.edu/Conference/animating/content/documents/SmithRumseyabstract.pdf> for the “Animating Archives: Making New Media Matter” conference held at Brown University, December 3–5, 2009, <http://www.brown.edu/Conference/animating/index.html>. Abby Smith Rumsey, Director of the Scholarly Communication Institute, University of Virginia Library spoke cogently to these issues.

14 Saturday October 7, 2009.

15 Clearly, my underlying argument resonates with traditionalist Humanities anxieties about scholarship and the effects on scholarship of the tools and resources which Google has suddenly provided. Geoffrey Nunberg, “Google’s Book Search: A Disaster for Scholars,” *The Chronicle of Higher Education*, August 31, 2009. However, I am not so much concerned with the preservation of cultural standards. I am entirely content that institutions should change. I just don’t think that such change should be at the whim of unacknowledged, ill-considered, and venal forces. The cultural vectors opened up by Google will only ever be able to change our institutions coherently and generatively if they remain susceptible to the values and standards of *all* our institutions, not only our mercantile and marketing institutions.

16 Daniel C. Howe suggests additional reference to: Jonathan Lethem, “The Ecstasy of Influence: A Plagiarism,” *Harper’s Magazine*, February 2007. More recently there is also the novel-as-manifesto-of-appropriation: David Shields, *Reality Hunger: A Manifesto* (New York: Alfred A. Knopf, 2010). The work of the late American novelist Kathy Acker was known for its techniques of appropriation, not to say plagiarism. In the story “Pierre Menard, Author of Don Quixote” Jorge Luis Borges imagines a French writer, Menard, who is so able to immerse himself in the earlier work that he “re-creates” it word for word. Recent gestures in the realm of Conceptual Poetics are relevant here. Kenneth Goldsmith’s *Day* consists of a straightforward transcription of the September 1, 2000 issue of the *New York Times* within the format and design of a standard 836-page book. Kenneth Goldsmith, *Day* (New Barrington: The

Figures, 2003). In a further conceptual gesture, Kent Johnson appropriated this work as his “own” with the connivance of Buffalo-based small press Blazevox by simply pasting over all references to Goldsmith, replacing them with a Johnson overlay. I possess a copy of the altered book, signed by the (latter) publisher.

- 17 I could, of course, do this in other domains using the resources of other institutions, but the thought of what this would mean is overwhelming—a life-changing shift into research on natural language, with single-minded devotion to finding or building the databases one would need. Google promises me an accessible corpus and even tells me that it is always already mine and everyone else’s—in good net-utopian terms—but then denies me service at crucial moments when I am beginning to build a poetic.
- 18 Extracts from Google’s Terms of Service, supplied by Daniel C. Howe:

2.1 In order to use the Services, you must first agree to the Terms. You may not use the Services if you do not accept the Terms

2.2 You can accept the Terms by:

(A) clicking to accept or agree to the Terms, where this option is made available to you by Google in the user interface for any Service; or

(B) by actually using the Services. In this case, you understand and agree that Google will treat your use of the Services as acceptance of the Terms from that point onwards

4.5 You acknowledge and agree that while Google may not currently have set a fixed upper limit on the number of transmissions you may send or receive through the Services or on the amount of storage space used for the provision of any Service, such fixed upper limits may be set by Google at any time, at Google’s discretion.

5.3 You agree not to access (or attempt to access) any of the Services by any means other than through the interface that is provided by Google, unless you have been specifically allowed to do so in a separate agreement with Google. You specifically agree not to access (or attempt to access) any of the Services through any automated means (including use of scripts or web crawlers) and shall ensure that you comply with the instructions set out in any robots.txt file present on the Services.

- 19 The following text is based on a short piece by Samuel Beckett that eventually became, as a final text in English, three fragments from: Samuel Beckett, *How It Is* [Comment c’est], trans. Samuel Beckett (New York: Grove Press, 1964). I searched Google for successively longer sequences of double-quote-delimited words from these fragments with the qualifiers: -Beckett -Beckett’s -Beckett’s (with prime and apostrophe) looking for pages on which the sequences occurred but are not associated with Beckett. The small letters beside each phrase may now be keyed to one of the webpages from which the phrases are hereby deemed to be quoted as at least cached by Google on Saturday February 15, 2010. They are not, that is, quoted from Beckett. ^a<http://books.google.com/books?id=RTRorA6RK-oC&pg=PA49&clpg=PA49&dq=%22blu>

e+and+white+of+sky%22; ^bmyhyggelig.blogspot.com/2009/12/moment-still.html; ^cgapersblock.com/mechanics/2009/06/30/inside-a-toxic-tour/; ^dlegacygt.com/forums/showthread.php?t=130524&goto=newpost; ^ematpringle.blogspot.com/; ^fwww.nrl.navy.mil/content.php?P=03REVIEW195; ^gwww.mattcutts.com/blog/gmail-inbox-zero/; ^hwww.theshadowbox.net/forum/index.php?topic=10610.30; ⁱwww.mountzion.org/johnbunyan/text/bun-caution.htm; ^jntl.matrix.com.br/pfilho/html/lyrics/m/mr_blue.txt; ^kiceagelanguage.com/Ducks/ducks_part1.pdf; ^lcucc.survex.com/expo/smkridge/204/uworld.html; ^mwww.redroom.com/blog/ericka-lutz/opening-and-closing; ⁿhttp://www.fibromyalgia-symptoms.org/forums/Fibromyalgia_Support_Groups/Stomach_pain_and_period_pain_/; ^ohttp://www.archive.org/stream/soundandthefurya013056mbp/soundandthefurya013056mbp_djvu.txt; ^pwww.theinsider.com/news/928384_Thanks_for_the_Laugh_Harvey; ^qhttp://books.google.com/books?id=ti_r1-aYuW4C&pg=PA337&lpg=PA337&dq=%22the re%27s+no+sense+in+that+now%22; ^rbooks.google.com/books?id=LCf0VPaT1wwC&pg=PA213&lpg=PA213&dq=%22been+none+for+a+long+time+now%22; ^swww.aysite.org/forum/topic.asp?TOPIC_ID=5166; ^tsecure.bebo.com/Profile.jsp?MemberId=1471591674; ^usolpadeine.net/acetone/lyrics/cindy.html; ^vwww.haaretz.com/hasen/spages/1076221.html; ^wbooks.google.com/books?id=gconvZ-DRLsC&pg=PA121&lpg=PA121&dq=%22thirst+the+tongue%22; ^xwww.flickr.com/photos/32296433@N07/3558411711/; ^yhttp://www.popmonk.com/quotes/challenge.htm; ^zhttp://t2.thai360.com/index.php?/topic/48834-isan-tawan-daeng-re-visited/; ^{aa}http://mshester.blogspot.com/2008/03/winter-you-are-finished.html; ^{bb}en.wikipedia.org/wiki/The_Image.

This text also comprises the final part of “The Image,” reproduced in a corrected translation in: *The Complete Short Prose, 1929–1989*, ed. S. E. Gontarski (New York: Grove Press, 1995). Despite the explanation given in the notes, pp. 283–284, it seems bizarre to me that the more or less complete version as found in *How It Is*, pp. 28–31 is not preferred for “The Image.” Certainly, for the final part of the piece, used here, I much prefer Beckett’s own renderings, for example, “I stay there no more thirst the tongue goes in the mouth closes it must be a straight line now it’s over it’s done I’ve had the image” rather than Edith Fournier’s “I stay like this no more thirst the tongue goes in the mouth closes it must be a straight line now it’s done I’ve done the image.”

- 20 In actual fact, I made this text by first alphabetically sorting the gathered sequences and only then rearranging them as little as possible in order to provide some kind of relatively coherent diegesis.
- 21 This preliminary piece from *The Readers Project* may be accessed from <http://thereadersproject.org>.
- 22 There is a great deal that could be written about *The Readers Project*: about how it operates and engages literary aesthetics from a critical or theoretical perspective, most of which would not be entirely relevant to the present discussion. However, it may be worth noting and commenting briefly on this sense of “proximate.” A proximate or neighboring word may be one that is contiguous with a reference word. In linguistics, such a word, for example, collocates with the reference word if it follows it in the line of the syntagm, in the metonymic dimension as Roman Jakobson called it. Another notion of proximity—in the complementary metaphoric dimension, that of

replacement—would see words such as synonyms or antonyms as (virtually) proximate to particular words of reference in the text. However, proximity or neighborhood may also be defined, in *The Readers Project*, in terms of the *typographic*, and this neglected dimension of textuality reveals itself, in our aesthetic analysis, as vital to, if not constitutive of, reading. (Typography is not, perhaps, neglected as a *graphic* art, but it is, arguably, neglected as an art of reading, as a literary art, *sensu stricto*.) Specifically, readers in the project currently have access to databases of information about all the actual word pairs in a text that they are “reading” combined with any (and all) third words existing in the text. Clearly the vast majority of these three-word combinations will not occur anywhere in the text itself as contiguous syntagms. These sequences of three words we call “perigrams” to distinguish them both from “bigrams” and “trigrams” in standard Markov analysis. Once we have derived a text’s perigrams, we then use Google to find counts for their frequencies in the internet corpus, and (for the moment) discard any perigrams with zero counts. This allows the readers to follow the standard syntagmatic line but to check arbitrary typographically neighboring words to see whether they would form a perigram that occurs in the natural language of the Google-accessible corpus. If they do, a particular reader may be allowed to follow the alternate syntagmatic line of reading that it has discovered in its typographic neighborhood.

Clearly “proximity” may be redefined in accordance with other features of linguistic items, including, for example, orthographic features. Thus the “mesostic” reader mentioned above looks for words containing particular letters and considers them “proximate” if they contain a letter that it requires to read-while-spelling. In point of fact, the current mesostic reader takes further cognizance of physical typographic proximity and also what one might call the relative “perigrammatic proximity” (just described) of two words that it might be about to read, for example, and that both contain the letter it needs to spell. It will prefer to read a word that is more proximate in the maximum number of dimensions. John Cayley, and Daniel C. Howe. *The Readers Project*. 2009. <http://thereadersproject.org> (accessed August 13, 2017). A more extensive methodological and computational introduction to *The Readers Project* was, at the time of writing, in final stages of review for Siggraph 2011 and is now published as: Daniel C. Howe and John Cayley, “*The Readers Project: Procedural Agents and Literary Vectors*,” *Leonardo* 44, no. 4 (2011): 317–324.

- 23 See above. A normal Markov model applied to language is only concerned with the syntagmatic dimension of language and takes no account of any typographic structure that it may have. The above definition of “perigrams” in *The Readers Project* takes some account of typography and thus complicates the standard Markov model.

Chapter 10

- 1 Confucius (= Kong Fuzi), *Confucius: The Great Digest, the Unwobbling Pivot, the Analects*, trans. Ezra Pound (New York: New Directions, 1969), 20. The

- quoted text is Pound's ideogrammic gloss for the character *cheng* (Wade-Giles: *ch'eng*) often translated as "sincerity." See also: *The Cantos*, LXXVI, 468/474.
- 2 N. Katherine Hayles, *Electronic Literature: New Horizons for the Literary*, Ward-Phillips Lectures in English Language and Literature (Notre Dame: University of Notre Dame, 2008).
 - 3 Alan Liu, *The Laws of Cool: Knowledge Work and the Culture of Information* (Chicago: University of Chicago Press, 2004).
 - 4 A representative quote: "Electronic literature extends the traditional functions of print literature in creating recursive feedback loops between explicit articulation, conscious thought, and embodied sensorimotor knowledge While print literature also operates in this way, electronic literature performs the additional function of entwining human ways of knowing with machine cognitions." N. Katherine Hayles, "Electronic Literature: What Is It?" in *Electronic Literature: New Horizons for the Literary* (Notre Dame: University of Notre Dame, 2008), 135. For "dynamic heterarchies" see: N. Katherine Hayles "Distributed Cognition in/at Work: Strickland, Lawson Jaramillo, and Ryan's *slippingglimpse*," *Frame* 21, no. 1 (2008): 15–29.
 - 5 Liu, 179.
 - 6 *Ibid.*, 3.
 - 7 *Ibid.*, 400, note 8.
 - 8 I am happy to see that this phrase has now been taken up quite widely in the literature, not least in Hayles's new book (Hayles, "Electronic Literature: What Is It?") and, for example, in: Peter Gendolla and Jürgen Schäfer, eds., *The Aesthetics of Net Literature: Writing, Reading and Playing in Programmable Media*, Media Upheavals (Bielefeld: Transcript, 2007). The phrase can also be shortened to "writing in programmable media" since *programming* enables *network*. The mark of an explicit relationship with practices of coding will continue to enrich and to specify our literary practices in these media, but it is not yet clear to me that programmability and processing give rise to *all* their distinguishing characteristics, or, for that matter, operate *significantly* or *affectively* in every example of those practices to which we turn our attention. Programming enables the network but cultural production on the net does not always practice coding and neither does every instance of writing in digital media. As a term, "writing digital media" attempts an abbreviated reference to this situation by encapsulating the conjunction of networked *and* programmable media, without specifying the precise grammar that underlies this conjunction. I am also anxious to note, in passing, that I consider coding to be a distinct cultural practice, distinct, that is from writing, for example.
 - 9 In email communication, Aden Evens has pointed out that my use of "form" as in "persistent form" differs from a stricter usage that would more closely ally the term with abstract form or, for example, the "concepts" underlying conceptual art, whereas my persistent form is—I acknowledge this and the point is brought into my argument explicitly below—implicated with particular (literary) material cultural manifestations, particular media that are able to bear particular forms without, however, determining "content" or its significance and affect. I agree that these distinctions require some elaboration beyond the scope of this chapter. Evens writes, "form is what the concept determines, whereas materiality manifests this form but also exceeds it. In

- 'traditional' artworks, this excess is precisely what makes the work great. That is, the formal is what can be fully captured by the digital, it is what gets preserved as 'information' " (email communication, August 4, 2008). My persistent form is not precisely this excess, but it would enable such excess to survive the work and its concept. I believe that the final paragraphs of Terry Harpold's interesting extended gloss on "hypertext" refer to these deep problems of form in the practices of writing (in) digital media—of form in inherited vs. programmable media, I might say. Terry Harpold, "Hypertext," in *Glossalalia*, ed. Julian Wolfreys and Harun Karim Thomas (New York: Routledge, 2003).
- 10 Liu, 389.
 - 11 Jacques Derrida, "The Word Processor," in *Paper Machine* (Stanford, CA: Stanford University Press, 2005), 25.
 - 12 Ibid.
 - 13 Jacques Derrida, "The Book to Come," in *Paper Machine* (Stanford, CA: Stanford University Press, 2005), 15.
 - 14 Nelson's conception of the "permascroll" was introduced after the last revision of: Nelson, *Literary Machines* 93.1. As such it does not seem to be often discussed. A definition, with related terms, can be found here: Lukka. The permascroll is the sequential record of *all* significant textual (or literary) events. A text would simply be a set of references to "spans" of the permascroll (which would clearly not be sequential). As here, for Derrida, this kind of totalizing structure designed to record the minutest discrete details of everything that can be recorded (begging the most significant of questions, namely: "What is the minutest discrete detail of everything?") is a potential apotheosis of literature, but one that also destroys literature by foreclosing precisely the kinds of development in culture and cultural production that we are addressing. It allows that literature might end, but in an *ultimate* sense on which "the book," by contrast, does not insist. I have discussed the permascroll earlier and above, see: "Time Code Language" in this volume.
 - 15 Jacques Derrida, "Paper or Me, You Know ...," in *Paper Machine* (Stanford, CA: Stanford University Press, 2005), 65.
 - 16 Ibid.
 - 17 Liu, 179.
 - 18 Ibid., 323.
 - 19 Instantaneous, simultaneous, and on-demand information is the engine of the postindustrial "now" submitting history to creative destruction, and it is the destruction of this eternal "now" or self-evident presence of information, therefore, that will have the most critical and aesthetic potential. Strong art will be about the "destruction of destruction" or, put another way, the recognition of the destructiveness in creation. Ibid., 8–9. See also: *ibid.*, chapter 11, *passim*.
 - 20 I am sometimes using the phrase "expressive *programming*" here, and this is because of my focus on works that are explicitly coded as an aspect of their composition and production, but I am thinking of and alluding to the more general term "expressive processing" which is the subject of an important monograph. Wardrip-Fruin.

- 21 We might consider, in passing, how this “ease” and “facility” (and “cool”) in relation to literary projects that previously demand special “effort” on the part of both writer and reader may one day alter our reading of the pioneering criticism of writing in digital media. Espen Aarseth subtitled his much-cited *Cybertext*, “perspectives on ergodic literature,” and suggested that the special effort required of readers who address writing in these media was a better indication of its specificities than, for example, non-linearity. But what happens when such effort becomes less than that required to turn a page or use an index? Cf. Aarseth, *Cybertext: Perspectives on Ergodic Literature*.
- 22 A. Braxton Soderman, *Mémoire involontaire* No. 1, 2008. *Electronic Literature Collection*, vol. 2 (2011), http://collection.eliterature.org/2/works/soderman_memory.html (accessed August 13, 2017).
- 23 Brian Kim Stefans, “Stops and Rebels: A Critique of Hypertext,” in *Fashionable Noise: On Digital Poetics* (Berkeley, CA: Atelos, 2003); Cayley, “overboard: An Example of Ambient Time-Based Poetics in Digital Art.”
- 24 Justin Katko and Clement Valla, *Yelling at a Wall: Textron Eat Shreds*, 2008. Plantarchy.
- 25 The trope of consumption—where new media artworks are seen to consume their own literary (corporal) substance—has been put forward by Christopher Funkhouser in a paper that goes so far as to cast it in terms of cannibalism. Christopher T. Funkhouser, “Le(s) Mange Texte(s): Creative Cannibalism and Digital Poetry,” in *E-Poetry 2007* (Paris: Université Paris8, 2007). Roberto Simanowski develops this critical approach as one aspect of his analysis of digital aesthetics, especially the fate of literature in digital art practice where he, to simplify, sees this consumption as reducing—at least in terms of the literary—the significance and affect of works that are (self-) identified as digital literature. Roberto Simanowski, “Digital Anthropophagy: Refashioning Words as Image, Sound and Action,” *Leonardo* 43, no. 2 (2010): 159–163.
- 26 Caleb Larsen, *Whose Life Is It Anyway?* 2008.
- 27 <http://twitter.com/jennyholzer>. (It’s extraordinary, reviewing and reissuing this 2008 essay in 2017, that I felt compelled to describe “what Twitter is” when it is now an institution by means of which a US president may execute policy. It is also extraordinary that Larsen produced, essentially, one of the first chatbots, long before they achieved any kind of currency.)
- 28 Derrida, “Paper or Me, You Know ...,” 46. Emphasis in the original.
- 29 I know how to make it work (more or less) but I don’t know *how* it works. So I don’t know, I know less than ever, “who it is” who goes there. Not knowing, in this case, is a distinctive trait, one that does not apply with pens or with typewriters either. With pens and typewriters, you think you know *how* it works, how “it responds.” Whereas, with computers, even if people know how to use them up to a point, they rarely know, intuitively and without thinking—at any rate, *I* don’t know—*how* the internal demon of the apparatus works. What rules it obeys. This secret with no mystery frequently marks our dependence in relation to many instruments of modern technology. Derrida, “The Word Processor,” 23.

Chapter 11

- 1 This statement is not equivalent to David Golumbia's reading of computationalism in so far as he suggests that individualism and Western neoliberalism have been underwritten by computationalist assertions that the mind and human relations generally may be exhaustively modeled by computational mechanisms or may be computational in themselves. However, I accord with Golumbia in suggesting that the kind of relationships that the network promotes, structurally, do tend to reinforce individualist and liberal sensibilities. David Golumbia, *The Cultural Logic of Computation* (Cambridge, MA: Harvard University Press, 2009).
- 2 See the discussion of data vs. *capta* below, as well as note 19.
- 3 "Big Software" is, as far as I am aware, my own coinage. "Big data" retains the gloss of digital utopianism since it appears, as do search engines' indexes, to promise universal accessibility and use, while in fact, as the tenor of this chapter indicates, "big data" is only properly accessible on terms from the servers of Big Software where it has been accumulated and processed.
- 4 McKenzie Wark, *A Hacker Manifesto* (Cambridge, MA: Harvard University Press, 2004).
- 5 Apart from Wark and Golumbia, who do not yet explicitly address, in particular, the implication of Facebook's vectoralist predominance, particularly welcome to and formative of this kind of critical discussion is: Geert Lovink, *Networks without a Cause: A Critique of Social Media* (Cambridge: Polity, 2011). See also: Roberto Simanowski, ed. *Digital Humanities and Digital Media: Conversations on Politics, Culture, Aesthetics, and Literacy*, Fibreculture Books (London: Open Humanities Press, 2016).
- 6 As I say, I select these organizations as exemplary. The vectoralist practices critiqued here are widely prevalent in companies both new and long-standing: Microsoft, Amazon, Apple, and so on, and all the fast-emerging social networking enclosures.
- 7 Google's own rendition of its corporate history is now (accessed January, 2013) available online at <http://www.google.com/about/company/>. AdWords, still the backbone of Google revenue, was introduced in 2000.
- 8 Significantly, from the point of view of institutional distinction, Wikipedia is operated by a non-profit charitable foundation, the Wikimedia Foundation.
- 9 Of course, there are problems such as the robotic generation of editorial events (spam), and the problematic treatment of subjects and entities who may also present themselves as peers, although they have—as for example a user who is also the subject of an article—non-negotiable proper interests in the material to be read. Golumbia briefly cites Wikipedia as contrastively exemplary of a networked service promoting genuine, as opposed to ostensible, democratization. Golumbia, 26.
- 10 <http://www.facebook.com/legal/terms> (accessed August 3, 2017).
- 11 "On April Fools' Day in 2004, we launched Gmail." <http://www.google.com/about/company/> (accessed January, 2013). I am suggesting that this wasn't about email and it wasn't even primarily about the generation of screen real estate for ads (see below); it was about accounts, and the ability to associate

data gathered from search and other services with the representation of human entities within an enclosure for big data. If this is correct, 2004 becomes the year of the advent of “big data” from my perspective, and the date for the advent of self-conscious vectoralist enclosures.

- 12 The coordination of human and posthuman desire may make it appear that something is added to human desire in this context, but it is salutary to consider the possibility that posthuman desire already is or may become a constrained and narrowed formation constituted by what is representable in computational systems or, perhaps more specifically, by particular regimes of computation. Golumbia is pessimistic in this regard.
- 13 It is clear that the net artist Constant Dullaart is sensitive to certain implications of such agreements, and if you are looking for a somewhat more entertaining and edifying way to familiarize yourself with Google’s TOS, I recommend a visit to <http://constantdullaart.com/TOS/> (accessed August 3, 2017). I am grateful to Clement Valla for introducing me to this work by Dullaart.
- 14 An ocean of legalese inserts itself into the interstices of getting and spending—warranties and disclaimers in the packaging of appliances, and so on. However, it seems to be only since the advent of Big Software that we, remarkably frequently, make active gestures of agreement to terms: a click, a press of the (default) return key. We make these gestures more frequently and more actively but, it seems to me, no less unthinkingly.
- 15 <http://www.google.com/intl/en/policies/terms/> (accessed August 3, 2017).
- 16 The lines and subsequent quotations in the same style are from a piece that accompanied the online publication of this essay: John Cayley, “Pentameters toward the Dissolution of Certain *Vectoralist* Relations,” *Amodern 2* (2013): n.p.
- 17 The university is under a great deal of pressure in this regard. Many universities have opted to use Gmail for the purposes of correspondence, for example, and the relationship of this correspondence to the university is institutionally implicated. Another, very different, institution comes to be involved and the question of how these distinct institutions interrelate will not go away. Now also, social media (Facebook) enters the scene as a further channel of correspondence and communication for members of the university. Next, social media models are applied to pedagogical tools and affordances. But perhaps most tellingly and corrosively, the advent of Online Learning, MOOCs, and commercial organizations, like Coursera and Udacity already challenge the university to adopt their services in a manner that may prove to be inimical to fundamental aspects of its institutional mission, particularly as a site of independent research, as both problematic and necessary complement to teaching and pedagogical dissemination.
- 18 Wark; “The Vectoralist Class,” *Supercommunity* 84 (2015): n.p.
- 19 “Data” has been prevalent for decades as indicative of the raw material of research. It seems particularly important now to consider what is and is not data. Strictly, data means “that which is given” as evidence of the world. However, the tools we use to take what the world gives may overdetermine the material we are able to gather. Arguably, the computational regime is overdetermined in a number of respects. It can only take as putative data

- what can be represented in terms of discrete symbolic elements, and it will tend to favor quantitative accumulation and analysis. Following Joanna Drucker, I prefer to use “capta,” for what has been able to be “taken,” when referring to the raw material collected and processed by networked services or indeed by the regime of computation in general. “A fundamental prejudice, I suggest, is introduced by conceiving of data within any humanistic interpretative frame on a conventional, uncritical, statistical basis. Few social scientists would proceed this way, and the abandonment of interpretation in favor of a naïve approach to statistical certain[t]y [online: “certainly”] skews the game from the outset in favor of a belief that data is intrinsically quantitative—self-evident, value neutral, and observer-independent. This belief excludes the possibilities of conceiving data as qualitative, co-dependently constituted—in other words, of recognizing that all data is capta.” Johanna Drucker, “Humanities Approaches to Graphical Display,” *Digital Humanities Quarterly* 5, no. 1 (2011): n.p. The distinction is fundamentally important and it is remarkable to consider that this seems to be the first time that it has been clarified for the era of so-called Digital Humanities. In the discourse of phenomenology, the understanding of data is carefully discussed, but—in a quick review—I have found only two relevant earlier references to the distinction as proposed by Drucker. I think these are worth citing in the circumstances. Christopher Chippindale, “Capta and Data: On the True Nature of Archaeological Information,” *American Antiquity* 65, no. 4 (2000): 605–612; Salvatore Russo, “Data vs. Capta or Sumpta,” *American Psychologist* 12, no. 5 (1957): 283–284. The latter is a brief review notice.
- 20 Robert Darnton, “Google’s Loss: The Public’s Gain,” *The New York Review of Books* LVII, no. 7 (April 28, 2011): 10–12.
 - 21 This may not be entirely clear. The results contain language, words, that were abjected by a human writer. As with all language, the symbolic aspect of language renders an orthothetic (direct/proper indication/pointing) relationship between the abjected words and these “same” words that appear in the results. The results are made, in part, of words that belong to, are proper to, the (typically) human writer who has read them abjectly and written them into the maw of the search engine. See below, the chapter’s concluding paragraphs, for the special and highly implicated case, when this appropriation of language, proper to a human writer, is applied to the algorithmic generation of advertisements.
 - 22 A curated version of this facility has been provided by Google in the guise of its Ngram Viewer, now moved from Google Labs and associated with the Google Books project at <http://books.google.com/ngrams/>. “Ngrams” are sequences of words (considered as linguistic tokens) of various lengths (n may range from 2 to 5 to n). Linguistic corpora, in this case Google Books, may be processed so as to provide the relative frequencies for occurrences of ngrams, and this information may be further processed so as to offer up linguistic and cultural insights. See: Michel et al. There are also, of course, opportunities for literary aesthetic practice, for example the author’s collaboration with Daniel C. Howe: Cayley and Howe. See also: John Cayley, “N-gram,” in *The John Hopkins Guide to Digital Media*, ed. Marie-Laure Ryan, Lori Emerson, and Benjamin J. Robertson (Baltimore: Johns Hopkins University Press, 2014).

- 23 Language, arguably, exemplifies a different relation between material as data and material as capta. Language is, as it were, always already abstracted from specific embodiment, nonetheless retaining its inalienable relation to the embodied world as a function of the requirement that it be read in order to exist. Language is easy to capture but difficult to read.
- 24 Google's predominance is founded on a historical (singular) circumstance in at least this respect: as it came to prominence, the raw material that it indexed was, basically, inscribed by human agencies. This is, clearly, no longer the case. On some estimates, more than half of the material inscribed on the surface of the network is generated by software rather than human authors and writers (see: <http://www.zdnet.com/blog/foremski/report-51-of-web-site-traffic-is-non-human-and-mostly-malicious/2201>; and the source: <http://www.incapsula.com/news/news-incapsula-press-releases/item/178-incapsula-reveals-31-of-website-traffic-can-harm-your-business>). Considerations of spam, algorithmic text, and website (link farm) generation—of the “dark net” in general—significantly complicate the arguments set out here, while the overall tendency of these argument remains, I would maintain, coherent.
- 25 Which is, see above, brought into being by readers and reading. This should cause us even greater concern since, as reading changes, the proper materiality (ontological substance) of writing changes. If readers read other things, then more of these other things exist as compared to those that might otherwise have existed as a function of having been read.
- 26 This is somewhat of a theme for: Columbia.
- 27 As fundamental elements of language, these abstractions come into existence and become entities as they are read or in relation to their readability. See above.
- 28 <http://www.google.com/about/company/> (accessed August 3, 2017).
- 29 See note 19.
- 30 *TrackMeNot* by Daniel C. Howe and Helen Nissenbaum is an artistic-critical address to precisely these issues. Daniel C. Howe and Helen Nissenbaum, *TrackMeNot*, 2008.
- 31 I am referring to the now commonly encountered presentation of textual advertisements in marginal spaces associated with web-based access to Google's Gmail. Google's algorithms “read” key words in the bodies of email messages and generate ads, often including these keywords in the copy, assuming an implicated interest in these terms on the part of the human authors of the email messages. I write an email to my mother at Christmas and I am presented with advertisements for seasonal gifts appropriate for mothers.
- 32 Jason Huff and Mimi Cabell's *American Psycho* project offers an aestheticized critique of this circumstance. The artists sent the entire text of Brett Easton Ellis' *American Psycho* between email accounts, page by page, noting the Google-generated advertisements that were triggered by words and phrases in Easton Ellis' text. They then printed a book with only the traces of these advertisements in the place of the text. See: Jason Huff, Mimi Cabell, and Brett Easton Ellis, *American Psycho*, 2010.
- 33 See the opening of the chapter above. In case this is not clear, these are statements associated with a philosophy of language and literary aesthetic

practice, specifically a theory of linguistic ontology that recognizes the coming into being of language as it is read.

- 34 Kashmir Hill, “Facebook Will Be Using Your Face in ‘Sponsored Stories’ Ads (and There’s No Opting Out),” *Forbes* 2011.

Chapter 12

- 1 See “The Gravity of the Leaf” in this volume and John Cayley, “The Gravity of the Leaf: Phenomenologies of Literary Inscription in Media-Constituted Diegetic Worlds,” in *Beyond the Screen: Transformations of Literary Structures, Interfaces and Genres*, ed. Peter Gendolla and Jörgen Schäfer, Media Upheavals (Bielefeld: Transcript, 2010).
- 2 This association with particular physical media is conventional and a function of human capabilities. It is also conservative: language finds it difficult to be deployed in other physical media, although in principle this would be possible. Vilém Flusser seemed to propose that linguistic symbolic practice will migrate to the “technical image.” Perhaps it’s on its way, but very slowly. Natural sign languages are, to my mind, the only instances of commensurate human language systems that are deployed in another physical medium—that of spatialized gesture.
- 3 One of the best expositions of this position that I know is implicit throughout the work of Derrida and set out fairly clearly in Derrida, “The Book to Come.”
- 4 I hope that this usage of “readability” will become clearer as the chapter elaborates. In art practical research, my collaborator Daniel C. Howe and I are exploring aspects of readability and the culture of human reading through Cayley and Howe.
- 5 In particular, this chapter follows on from thinking in “The Code Is Not the Text,” included in this volume and at John Cayley, “The Code Is Not the Text (Unless It Is the Text),” *Electronic Book Review* (2002): n.p.
- 6 Saying that it is “easier” to read glosses over a wide range of ways in which the “ease” of this facility may be generated: through choice of reserved words and operators, through the deployment of more familiar syntax, etc. etc.
- 7 I use “privileged” to indicate the kind of special and necessary relationship between low-level (machine) codes and particular hardware configurations.
- 8 These works are referred to and discussed using a range of terms by critics of Baldessari’s work. “Composite photoworks” is from: Bruggen, 131 ff., 184.
- 9 This consideration of virtual linguistic artifacts in a visual field has many fascinating special cases that it is impossible to go into here in any detail. Consider the status of the title on the cover of the (second) book in 2a. It is readable and also, thus, “language-as-such,” but it is also comfortably, diegetically part of the image-of-a-book-cover and so does not exemplify the diegetic break that language, I claim, *always* registers. There are the cases of film titling; (usually failed) attempts to introduce readable language into film and video; and subtitles that are “invisible” despite the fact they usually also embody a ghastly, tasteless disregard (without evoking the obvious necessary

diegetic break between one *language* and another) for the composition of the cinematic frame. The historian of East Asian art Robert Harrist has written about the representation of writing and writing itself, inspiring some of my thinking in: Harrist Jr.

- 10 Instances from “Monoclonal Microphone” were first published, thanks to its editor, Benny Lichtner, with a somewhat extended description of the process in: John Cayley, “From: *Writing to Be Found*,” *adj noun*, Spring 2011. This work was built using Processing (<http://processing.org>), and the RiTa natural language processing library by Daniel C. Howe (<http://www.rednoise.org/rita/>).
- 11 The discussion, below, of our last example from distinctly computational digital language art refers to an exemplary and *executable* instance of such criticism.
- 12 Nick Montfort and Stephanie Strickland, *Sea and Spar Between*, 2010. In *Dear Navigator*, SAIC, Chicago.
- 13 Nick Montfort and Stephanie Strickland “Cut to Fit the Tool-Spun Course: Discussing Creative Code in Comments,” *Digital Humanities Quarterly* 7, no. 1 (2013).
- 14 Stephanie Strickland, *V—WaveSon.nets. V—losing l’una*, Penguin Poets (New York: Penguin, 2002); Stephanie Strickland, Cynthia Lawson Jaramillo, and Paul Ryan. *Slippingglimpse*. 2007. <http://slippingglimpse.org> (accessed August 13, 2017).
- 15 The series of works I am thinking is: Nick Montfort, *ppg256 series: Perl Poetry Generators in 256 characters*. 2008-ongoing. <http://nickm.com/poems/ppg256.html> (accessed August 13, 2017).
- 16 Shelley Jackson, *Skin: A Story Published on the Skin of 2095 Volunteers*. 2003. <http://ineradicablestain.com/skindex.html> (accessed August 3, 2017).

Chapter 13

- 1 The conference took place from March 4 to 5, 2016, and was organized by Sydney Skybetter. Website, <http://www.choreotech.com> (accessed March 20, 2016).
- 2 This reference to and usage of pharmakon is inspired by the critical thought of Bernard Stiegler. See, among many other references: Bernard Stiegler, *For a New Critique of Political Economy* (Cambridge: Polity, 2010); *What Makes Life Worth Living: On Pharmacology*, trans. Daniel Ross, English ed. (Cambridge, UK and Malden, MA: Polity Press, 2013).
- 3 While digitization might be used for both senses, digitalization may also be deployed to indicate, generally, institutional and social reconfiguration and accommodation to digital culture and networked computation, whereas digitization may have a constrained sense: the encoded representation of information about the world in digital form.
- 4 John Cayley, “Terms of Reference & Vectoralist Transgressions: Situating Certain Literary Transactions over Networked Services,” *Amodern* 2 (2013): n.p.; “Pentameters toward the Dissolution of Certain *Vectoralist* Relations.”

- 5 John Cayley, *The Listeners*. 2015. Custom software, aurally accessible linguistic compositions, and “skill” for the Amazon Echo’s “Alexa” using the Alexa Skills Kit. <http://programmatology.shadoof.net/?thelisteners> (accessed March 20, 2016); John Cayley, “*The Listeners*: An Instance of Aurature,” *Cream City Review* 40, no. 2 (2016): 172–187; John Cayley, “Aurature at the End(s) of Electronic Literature,” *Electronic Book Review* (2017): n.p.
- 6 “Terms of Reference & Vectoralist Transgressions: Situating Certain Literary Transactions over Networked Services.” Included in this volume.
- 7 It was Patrick Corbin, a prominent dance artist and professor of Contemporary Dance at the Kaufman School of Dance, University of Southern California, who suggested this term.
- 8 Vilém Flusser, *Does Writing Have a Future?* trans. Nancy Ann Roth, Electronic Mediations (Minneapolis: University of Minnesota Press, 2011); *Into the Universe of Technical Images*, trans. Nancy Ann Roth, Electronic Mediations (Minneapolis: University of Minnesota Press, 2011).
- 9 James Bridle is credited with coining the term, for which there is a Wikipedia entry, https://en.wikipedia.org/wiki/New_Aesthetic (accessed March 20, 2016), leading to a number of manifestations by Bridle, including, James Bridle, “The New Aesthetic: Waving at the Machines.” <http://booktwo.org/notebook/waving-at-machines/> (accessed March 20, 2016).
- 10 See “The Gravity of the Leaf” in this volume, and: Cayley, “The Gravity of the Leaf: Phenomenologies of Literary Inscription in Media-Constituted Diegetic Worlds.”
- 11 Clement Valla, *Postcards from Google Earth*. 2010. <http://www.postcards-from-google-earth.com> (accessed 20 March, 2016); Curt Cloninger, “Manifesto for a Theory of the ‘New Aesthetic,’” *Mute* 3, no. 4 (2013): 16–27.
- 12 In terms of the type of analysis that I am outlining here, Valla’s project exemplifies another media-constituted diegetic break that is interesting, although less immediately important for our argument. This is the break between, as it were, the diegesis of the snapshot or postcard and that of the mapping system that is represented by Google Earth. The break is, of course, visually manifested by the framing of the postcards themselves, breaking them out of the map and its transformations. His insightful, aestheticized exposure of the contrasting ways that human participants relate to these two diegetic worlds and act with and within them is, of course, an important impetus for Valla’s project.
- 13 For subsequent projects, Valla has contextualized his process in terms of photogrammetry, a pre-computational analytic practice of photography and clearly also productive of symbolic image in the terms set out here: Clement Valla, *Surface Proxy* (Paris: XPO Gallery, 2015). In the *Surface Proxy* catalogue cited, see, especially, the Notes on pp. 79–94. This catalog is available in PDF form at http://clementvalla.com/wp-content/uploads/2015/06/clement_valla_surface_proxy_web.pdf (accessed March 26, 2016).
- 14 See “Reading and Giving” in this volume and: John Cayley, “Reading and Giving—Voice and Language,” *Performance Research* 18, no. 5 (2013): 10–19.
- 15 *As language*, these high-order breaks, as we will see, may be discovered by close reading. They may also, of course, be explicitly marked by punctuation—whether this be more or less conventional punctuation or distinctly

paralinguistic. For example, within the scope of graphic inscription and typography, such a break could be marked by a change of font or a change of a single font's color. These marks, however, are at best paralinguistic; they are distinctions inscribed into the material support of the language rather than into the language as such.

When it comes to language in aurality—as human or humanoid voice—the situation becomes more complex because we cannot (yet) conceive of the voice that is not marked by human individuality. This implies that whatever a voice inscribes is, minimally, within the diegetic scope of this individuality. If an apparent individual is subject to symbolic process for the production of their language, would this not break their individuality and require a change of voice (perhaps expressed as distinct intonation or accent—think also of acting, drama, and the complexities that this field of aesthetic practice would *further* introduce)? These are questions—somewhat beyond the present scope of this chapter—that become crucial since the advent of distributed entities that speak and listen—like Siri, Cortana, Google Now, Watson, and Alexa, all of which are literally embodied as transactive synthetic language. The language of these entities is symbolic image in the terms delineated here. It is a synthesis of conventional linguistic image and language-generative symbolic process. Not only are the broken diegeses of this language disguised by their inevitable coincidence with differences that constitute language as such, synthetic language in aurality must also be wrapped within one of the definitive indications of human embodiment, an individual voice. This renders the implicated symbolic processes compelling in so far as they acquire a compelling relationship with embodied humanity. The resultant voices are not, by the way, necessarily “uncanny” (disturbingly human-seeming non-human). They are something more troubling than that. They are signs of the advent of a new kind of transactive being that is able to share our language-making and language-reading.

- 16 The “language” of “formal languages” is within quote marks here because I would prefer to reserve “language” for natural human language. Otherwise, the use of “language” is inflated, as Derrida pointed out long ago: Derrida, *Of Grammatology*, 6 ff. Formal “languages” are exhaustively describable in structuralist terms such as sign, grammar, difference—structure, math, logic. The poststructuralist critique, especially as emerging from Jacques Derrida’s grammatology, underlies my thinking throughout, where, for example, difference must be—and must also be superseded/supplemented/erased by—*différance*, but only in so far as this is readable as generative of those kinds of meaning that are vital for human animals.
- 17 There is, of course, a reference to long-standing and ongoing discussions of the interrelationship of code and text in, especially, the field of electronic writing, digital literature, and so on. The deliberate, aesthetically or conceptually motivated, synthesis of literal code and text is and will continue to be practiced—notable practitioners: Mez Breeze, Talan Memmott, Alan Sondheim, the last of whom is credited with a term for this practice, namely “codework”: Alan Sondheim, “Introduction: Codework,” *American Book Review* 22, no. 6 (2001): 1, 4. The author has made his own contribution to the debate; see “The Code Is Not the Text” in this volume and: Cayley, “The Code Is Not the Text (Unless It Is the Text).”

As an example of a highly interesting and conceptually superlative form of the practice, I would like to cite William P. Hicks *Esopo* project: William P. Hicks, Email, March 29, 2016. Hicks's approach is to specify formal languages—ideally languages that are Turing complete; that is, languages that are capable, in principle, of computing anything computable—on the basis of the selected features of existing natural linguistic textual forms. For such an approach, aspects of punctuation—particularly actual punctuation “marks” and also the significant arrangement of “white space” such as lineation, spacing, and indentation—are crucial, but selected textual “tokens”—typically to be defined as “reserved words”—will also figure in the specification. The goal of a particular constituent language within this project might be, for example, to implement a specification that will allow any text that is formatted according to genre conventions or, indeed, *any text at all*, to be successfully compiled into a machine language executable. In other words, the text is rendered interpretable—by the specification—as the “high level” source code of a program that will compile and run on some arbitrary hardware platform. Hicks has, indeed, made a specification that will allow the compilation of any text, but he has also specified an inherently more interesting language, “Emily,” that is able to interpret and compile any of the poems of Emily Dickinson, and thus also, by definition, any original poems that follow the textual and poetic conventions of Dickinson's work.

Success in the compilation of a text is a necessary condition for it to be considered as conforming to an *Esopo* language specification, but Hicks's proposal is that there are expressive and aesthetic potentialities in refined instances of the practice. A language that allows *any text* to be compiled must allow that the vast majority of texts will compile as programs that do little more than nothing. Most of them will be instances of “Hello World,” one imagines. Hicks, however, writes that “Emily” compiles Dickinson poems as “non-trivial algorithms.” Hicks conceives of a constrained writing practice—self-reflexive with regard to its own structures, which are implemented as an *Esopo*—that would bring into existence texts that do something significant and affective in the worlds of both human reading and machinic computation. To quote Hicks himself, “Some [*Esopo* languages] are designed to compile almost any text they receive as input, while others demand strict adherence to certain formal rules. Other languages are designed not so much to encourage production of new algorithmically-engaged text as to draw attention to the structure of existing work.” Ibid.

- 18 A good way into Montfort's work is: Nick Montfort, *#! [Shebang]* (Denver: Counterpath, 2014). The author has also written a review essay of this book that deals with a number of related issues in the theory and practice of digital language art, computational poetics, and the poetics of computation. John Cayley, “Poetry and Stuff: A Review of *#!*” *Electronic Book Review* (2015): n.p.
- 19 Montfort, *ppg256 series: Perl Poetry Generators in 256 characters*.
- 20 John Cayley, *Image Generation: A Reader* (London: Veer Books, 2015), 34–57, 138–139.
- 21 Cayley and Howe.
- 22 Cayley, *Image Generation: A Reader*, 35.

- 23 Personal email communication, March 21, 2016. *Primary Source* was first publicly exhibited at the “Proxy” curatorial space, Providence, RI, March–April, 2015 as part of a group show entitled “Maximum Sideline: Postscript.” Capone self-published a print-on-demand artist’s book/chapbook version to coincide with the installation. On-demand print copies of this book may be ordered from the following URL: <http://www.lulu.com/shop/francesca-capone/primary-source/paperback/product-22217179.html> (accessed March 26, 2016). Both video and PDF versions of the work were subsequently published online by Gaus PDF (<http://gaus-pdf.com>), PDF: <http://www.gauss-pdf.com/post/121599676480/gpdf177gpdf016-1-francesca-capone-primary>, and video: <http://www.gauss-pdf.com/post/121599892473/gpdf177gpdf016-2-francesca-capone-primary>. Francesca Capone, *Primary Source* (Providence, RI: Self-published artist’s book; also available online from Gauss PDF, 2015). Remarks following on in the main text are adapted from an afterword that the author wrote for Capone’s chapbook.

Chapter 14

- 1 Derrida, *Of Grammatology*.
- 2 James R. Hurford, *The Origins of Grammar*, Language in the Light of Evolution (Oxford and New York: Oxford University Press, 2012); *The Origins of Language: A Slim Guide* (Oxford: Oxford University Press, 2014).
- 3 Ibid.
- 4 Stanislas Dehaene, *Reading in the Brain: The Science and Evolution of a Human Invention* (New York: Viking, 2009).
- 5 Derrida, *Of Grammatology*; Stiegler, *For a New Critique of Political Economy; What Makes Life Worth Living: On Pharmacology*; “Digital Knowledge, Obsessive Computing, Short-Termism and Need for a Negentropic Web,” in *Digital Humanities and Digital Media: Conversations on Politics, Culture, Aesthetics, and Literacy*, ed. Roberto Simanowski (London: Open Humanities Press, 2016).
- 6 Roberto Pieraccini, *The Voice in the Machine: Building Computers That Understand Speech* (Cambridge, MA: MIT Press, 2012).
- 7 N. Katherine Hayles, ‘Prologue.’ In *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999), xi–xiv.
- 8 V. N. Vološinov, *Marxism and the Philosophy of Language*, trans. Ladislav Matejka and I. R. Titunik (Cambridge and London: Seminar Press, 1973); Jean-Jacques Lecercle and Denise Riley, *The Force of Language*, Language, Discourse, Society (Houndmills and New York: Palgrave Macmillan, 2004).
- 9 Matthew Rubery, *The Untold Story of the Talking Book* (Cambridge, MA: Harvard University Press, 2016).