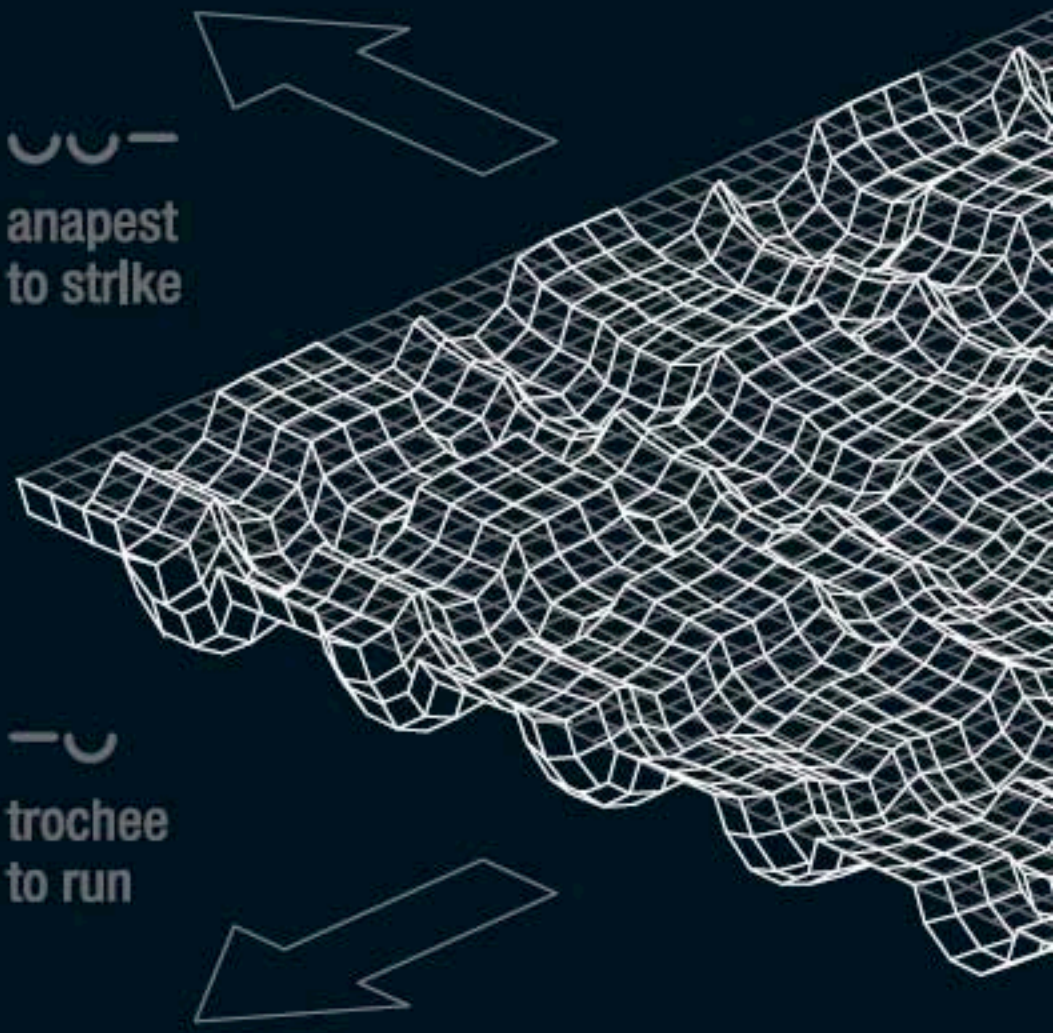
PREHISTORIC DIGITAL POETRY

AN ARCHAEOLOGY OF FORMS, 1959–1995

C. T. FUNKHOUSER



Prehistoric Digital Poetry

MODERN AND CONTEMPORARY POETICS

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An Archaeology of Forms, 1959–1995

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To my comrades in the present and to cybernetic literary paleontologists of the mythic future

"The poem is a machine," said that famous man, and so I'm building one.
Or at least I'm having it built, because I want something big and impressive and automatic.
You see, people will stand in front of it and insert money, dimes or quarters, depending upon the poem's locus.
Yes the whole thing will clank and hum and light up and issue a string of words on colored ticker-tape.
Or maybe the customers will wear ear-phones and turn small knobs so the experience will be more audile-tactile than old fashioned visual.
In any case they will only get one line at a time,
This being the most important feature of my design which is based on the principle that,
In poetry, "one perception must immediately and directly lead to a further perception,"
And therefore the audience will be compelled to feed in coin after coin.

Now I admit that the prototype model that you see on display is something of a compromise, as it has a live poet concealed inside.
But I assure you that this crudity will eventually be eliminated
Because each machine, I mean each poem, is to be fully computerized
And so able to stand on its own feet.

—Lionel Kearns, "Kinetic Poem" (1968)

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Foreword

A basic statement about literature might be that any statement is possible: literature means I can say anything. At the same time, certain statements are already subject to regulations and distributions. A basic statement on poetics might be that it deals with the possibilities for statements at a given moment: *poetics* means what is possible for me to say now. (Of course, I may still say what remains impossible.) However provisional and contested these basic statements may be, they open onto the problem of defining digital poetry, which is no more and no less than the problem of contemporary poetics. The definition of *digital poetry* remains up for grabs. For the true skeptics—and they do exist—digital poetry is an impossibility. In this view the computer is intrinsically unsuited for the creative act of writing poetry for a variety of reasons, ranging from the fact of its strict programming to the inverse fact of its lack of a structure for invention. A milder version of this position sees no real poetry yet written in digital media—all flash and no creativity, at least so far.

Even the enthusiasts of digital poetry, those in the know, cannot agree on the definition of *digital poetry.* Of course, this is all for the best, a necessary debate in an emerging field. What is most interesting is the reemergence of basic aesthetic questions from the specific problem of defining *digital poetry.* The question of defining *digital poetry* devolves to the question of poetry itself, of distinguishing what makes a poem a poem and not something else. If this is a very old question, it is also one that is more or less muted in the broad normalization of avant-garde poetry. In what might be seen as the segmented contemporary institution of poetry, especially in academic settings, it is perfectly possible to earn a PhD or tenure as a student and

scholar of innovative poetry. Of course, this is also all for the best, but given such friendly conditions for innovative work, where we know the answer to basic questions of poetics, we too quickly cease to ask the questions. These questions are immediate in digital poetry. Digital poetry is the contemporary site of intense concern with poetics.

Loss Pequeño Glazier's *Digital Poetics: The Making of E-Poetries* was the first book-length work on digital poetry and remains the benchmark. Glazier led the way for the critical assessment of digital poetry as a subject of academic study. His work cogently argued for the innovative literary significance of digital poems. His method is critical in the most fundamental sense: he makes distinction. To convince that possibilities of invention and creation in digital poetry parallel those in other media, Glazier isolates specific examples of innovative practice through parallel sequences of innovative poets: Williams, Creeley, and Mac Low, for example, and in digital poetry Cayley, Rosenberg, and Glazier himself. Make no mistake, Glazier's list is extendable and flexible, and it potentially includes diverse and contradictory voices. Nevertheless, the point is to exemplify and to show innovative relations to language within each list. Both the first group and the second group engage language as an active medium of discovery. Through the resulting analogical relation Glazier convinces us of a continuity of innovation. "The making" of Glazier's title is as much about how e-poetry is made as it is the basic evaluation of e-poetry as focused on innovation and making.

The result is persuasive, and this is part of the lasting value of Glazier's book. Of course, the exemplary force of the persuasion narrows the field. Glazier's approach requires making critical distinctions within poetry, and the critical view necessarily includes some works and excludes others. In turn, a generation of critics and readers follow Glazier's lead. For example, Brian Kim Stefans's *Fashionable Noise: On Digital Poetics* primarily defines digital poetry in the negative, as distinct from printed poetry. Some texts count, and others do not. My point is not to question the value of this sort of critical work. The grounds of appreciation and reading of digital poetry rely on Glazier, Stefans, and others.

When I state that by contrast, Christopher Funkhouser's *Prehistoric Digital Poetry: An Archaeology of Forms, 1959–1995* is not critical, I mean this as a statement of the book's high value. The book's method is fundamentally open. Rather than a system of inclusion and exclusion, Funkhouser considers digital poetry as flexible, indeterminate, and perhaps infinite in scope.

He maintains continuities between earlier media (print, orality, etc.) and with an enormous range of poetic experimentation. *Prehistoric Digital Poetry* is not concerned with criticism but with the historical conditions of possibility. Rather than start from the current production of digital poetry and justify its value for academic study, as Glazier does, *Prehistoric Digital Poetry* turns to disparate and subterranean experiments and innovations that combined, in often startling and contingent ways, to make it possible to speak of digital poetry at all in the first place.

Prehistoric Digital Poetry expands the field of what might be considered digital poetry, not in the least by showing that poetic experimentation was happening from the first invention of digital technology. Funkhouser traces the first digital poetry to a random text generator written on a Zuse Z22 computer by Theo Lutz and described in a 1959 article. The early date is striking, considerably earlier than allowed by any other recent discussion of digital literature, yet it is perfectly possible to hold that this was not digital poetry at all. In widening the dating of digital poetry well beyond the horizons of contemporary debates, Funkhouser insists on the margin between experimentation and the formalization of a discourse. We might say that Lutz's piece is not digital poetry but something like a poem experimenting with digital technology. The difference is significant and not simply semantic. The experiment occurs at a preconceptual point in a discourse where nothing could be said in or of digital poetry. In this sense the poem is singular and, in a strict sense, prehistoric. We might say that digital poetry did not yet exist as a "positivity," in Michel Foucault's sense. There was no archive of digital poetry. As a result, Funkhouser offers an important resituation of the recent emphasis on materiality in poetics. While Glazier insists on materiality as a qualification of innovative poetry, a qualification carried over to digital poetry, Funkhouser's history shows that this materiality is no immutable ground but must be accumulated and formed. Materiality for poetics is a historical achievement, an aggregation of possibilities for consistent and renewable figural relations between forms and materials. In a field that is often characterized by debates over materiality versus immateriality (or virtuality), I think this emphasis is timely and necessary.

Prehistoric Digital Poetry is a profound work of archaeology, describing the historical construction of the archive necessary for digital poetry. Funkhouser's historical scale, from 1959 to 1995, exactly situates the boundaries where prehistory becomes history, where experimentation becomes form, where digital poetry becomes possible. The result is valuable both to the

study of digital poetry and to theoretical concerns with contemporary literary production. By outlining the institutional emergence and possibility of digital poetry, Funkhouser models a certain kind of literary history. To emphasize this point, let me conclude by invoking Harold A. Innis, Marshall McLuhan's sadly overlooked mentor, who was recently revived in the German *mediawissenschaft* or "media science" of Friedrich Kittler and his students as a supplement to Foucauldian discourse analysis. In particular, Innis's *Empire and Communications* assessed the stability of historical empires in terms of their ability to balance light, transportable, and spatial media, on the one hand, and heavy, durable, temporal media on the other. This approach led Innis to resituate all available history in terms of communications media. If it is true that many good and timely reasons make us go against Innis's intentions and seek the destabilization of political empires, it is equally true that the force of his analysis remains useful despite the problems of his aims. If empires are dependent variables of media, the very empiricity of what we experience as history becomes a function of the work on media by communities of makers. Empire and communication are conditioned by the poetics of media. Funkhouser's archaeology shows poetics conditioning the emergence *into* the history of digital poetry. Without a doubt digital poetry today is an empire, part of a growing institution of new media studies, and tied to academic departments, industry funding, and government grant cycles. It becomes so, however, through the actual practices of communities of writers and readers. In the end this is the vital, prehistoric truth that Funkhouser's book presents.

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A Chronology of Works in Digital Poetry, 1959–1995

This chronology provides the initial works done by poets (or publishers) and the first developments in particular areas of digital poetry. Many (but not all) of these events are discussed in the following chapters. As a record of advancements that occurred within the genre, this document aims to be encompassing and inclusive though not complete. Every work by every artist is not highlighted, and undoubtedly more works will be brought to my attention upon the publication of this book.

1959

- First programs of computer poems, "Stochastische Texte" (a text generator) by Theo Lutz

1960

- Oulipo founded
- Brion Gysin's permutation poem "I am that I am" programmed by Ian Somerville

1961

- Nanni Balestrini's "Tape Mark I" created with code and punched cards on an IBM 7070
- Rul Gunzenhäuser, "Weinachtgedicht" (automatic poems)

1962

- "Auto-Beatnik" (*Time,* May 25)

1963

- Balestrini, "Tape Mark II"
- Clair Philippy, five poems published in *Electronic Age* ("blank verse at the rate of 150 words a minute")

1964

- Jean Baudot, *La machine a écrire* (text generator)
- Phillipy creates strophes using a vocabulary with one hundred words with the assistance of computer
- L. Couffignal and A. Ducrocq create "Un doute agréable couleur de lotus endormi . . . ," an imitation surrealist poem created on Calliope hardware system

1965

- Emmett Williams uses 101 most used words from Dante's *Divine Comedy* to create "Music," a computer poem
- Lionel Kearns, "Birth of God/uniVerse" (visual poem)

1966

- Williams, "The IBM Poem"
- Gerhard Stickel, "Autopoeme," "Monte-Carlo-Texte"

1967

- Baudot, "Rephrase"

1968

- "The Computer and the Arts" exhibition, Institute of Contemporary Art, London
- E. M. de Melo e Castro, *Roda Lume* (videopoem)
- Alison Knowles and James Tenney, "A House of Dust"
- Tenney, "Hank and Mary, a love story, a chorale"
- Douglas Englebart, "Augment"

1969

- Jackson Mac Low, "PFR-3 Poems"
- Svante Bodin, "Transition to Majorana Space"

1970

- Alan Sondheim, "4320"
- Carl Fernbach-Flarsheim, The Boolean Image/Conceptual Typewriter
- Dick Higgins, *Computers for the Arts*

1971

- Louis Milic, "Returner"
- Gerrit Krol: *APPI: Automatic Poetry by Pointed Information*
- Waldemar Cordeiro, "Arteônica" (exhibit of computer art)

1972

- Aaron Marcus, "The City Sleeps but Someone Is Watching"
- Erthos Albino de Souza, "Le tombeau de Mallarmé"

1973

- Richard W. Bailey edits *Computer Poems* anthology

1974

- *rjs,* Energy Crisis Poems

1975

- Richard Kostelanetz, 3 Prose Pieces (video)
- "Europalia" event in Brussels
- Albino de Souza, "Ninho de Metralhadoras"
- Cordeiro, "Gente"

1976

- Angel Carmona, "Poemas V2: Poesía compuesta por una computadora"

1979

- Philippe Bootz, combinatory poems on minicomputer
- Sondheim, "TI59 Poems," "Iceland" (generators)
- Csaba Tubak, "Electronic Game and Tool for Writers"

1980

- Jean-Pierre Balpe, "Poèmes d'amour"
- Robert Adrian founds ARTEX

1981

- Silvestre Pestana, "Povo-Ovo"
- Charles O. Hartman, poetry composer (the Scansion Machine)

1982

- Eduardo Kac, "Não" (animated poem)
- A.L.A.M.O. (workshop of mathematics and computer-assisted literature)
- Roger Laufer and Michel Bret, *Deux mots*
- Julio Plaza, "luzazul"
- Augusto de Campos, "pluvial . . . fluvial"
- Alice Ruiz, "acende apaga . . . apaga acende . . . vagalume"

1983

- Kac, "Holopoems"
- John Cayley, "wine flying"

1984

- Hugh Kenner and Joseph O'Rourke, TRAVESTY software
- *Swift Current* (online magazine)
- bpNichol, *First Screening* (animated poems in Apple BASIC)
- *THE ALCHEMIST* (diskette magazine)

1985

- Les Immatériaux (A.L.A.M.O.) exhibit at Pompidou Center, Paris
- John Cage, "Mesostics" (published on the WELL)
- *Art Access,* online (Minitel) publication, France
- Fred Truck, *Art Com Electronic Network* on the WELL
- Lenora de Barros, "Entes . . . Entes . . . "
- Kostelanetz, *Antitheses*
- Joao Coehlo, *Universo*

1986

- Bootz, telematic poems, "Metamorphose"
- Michael Newman, The Poetry Processor
- Geof Huth, "Inchworms" (Apple BASIC)
- Harry Polkinhorn, *Bridges of Skin Money* (visual poems)
- Robert Pinsky, "Mindwheel"

- Enzo Minarelli, "Volto Pagina" (video)
- Kac, *Tesão* (videotext)

1987

- mIEKAL aND, *Zaum Gadget,* PataLiterator
- Xexoxial Endarchy, *Internalational Dictionary of Neologisms* (HyperCard version)
- Huth founds dbqp press
- Judith Kerman, *Interactive Poem Demo Animated Picture Poems*
- Albertus Marques, *Chuva*

1988

- Jim Rosenberg, *Intergrams*
- Cayley, "wine flying" converted to diskette
- Your Personal Poet, Computer Poet Corporation (generator)
- Andrew Stone, *Haiku Master*
- William Dickey, HyperCard poems
- Louis Crew, Poetease (program)

1989

- *Alire* produced on diskette (multiple authors)
- Melo e Castro, *Signagens* (digital videopoems)
- Hartman, DIASTEXT
- Rod Willmot, "Everglade" (hypertext poem published by Hyperion SoftWord)
- Clemente Padín, "AIRE" (video)

1990

- André Vallias, "Nous n'avons pas compris Descartes"
- Robert Kendall, kinetic poems created for DOS
- Jim Andrews, *And Yet* magazine
- Minarelli, *Polypoesia*

1991

- Cayley's *Indra's Net* (HyperCard)
- AWOPBOP founded (University at Albany)
- "PoetryStar" (instructional program, Chatfield Software)
- Dickey, "Heresy"

1992

- "poesíe-digitale dichtkunst" exhibition curated by Vallias, with Friedrich Block
- *Action Poétique* published with disk
- A. de Campos, "Poema-Bomba" (computerized)
- Pestana, "Ego II"
- Fritz Lichtenauer, "Computertextgrafik"

1993

- *Eastgate Quarterly Review of Hypertext* 1.1, Rosenberg's *Intergrams*
- Patrick-Henri Burgaud (with Jean-Marie Dutey), *La mer*
- online publications: *GRIST, RIF/T, We Magazine Issue 17*
- POETICS listserv, SUNY-Buffalo
- Judith Malloy, *Its Name Was Penelope* (Eastgate, HyperCard)
- Deena Larsen, *Marble Springs*
- Arnaldo Antunes, *NOME, Cultura* (video)
- Chris Funkhouser, *MOO poems*
- "(Pré)texte à voir" poetry-video exhibition Art 3000 (Paris)

1994

- A:\LITTÉRATURE interactive publication
- Electronic Poetry Center founded (SUNY-Buffalo)
- Balpe, *Génération*
- Kathryn Cramer, *In Small & Large Pieces*
- HiPitched Voices (MOO)
- Barros, *A cidade e seus fluxos* (CD-ROM)
- GRIST Online
- Fabio Doctorovich, *Bribage cartooniano*

1995

- *The Little Magazine,* vol. 21 (CD-ROM)
- Kenner and Hartman, *Sentences*
- Andrews, *Vispo* and *Webartery* (WWW discussion group)
- Laurie Anderson, *Puppet Motel* (CD-ROM)
- Truck, *Bottega* (CD-ROM)
- Doctorovich, "Chatgattcat (o rotaciones)"
- Ladislao Pablo Györi, "Virtual Poetry"

Prehistoric Digital Poetry

Introduction

Evolving Circuits of Digital Poetry

Digital poetry is a new genre of literary, visual, and sonic art launched by poets who began to experiment with computers in the late 1950s. *Prehistoric Digital Poetry: An Archaeology of Forms, 1959–1995* provides an analysis of relevant works and examines encounters between poetry and computers prior to the advent of the World Wide Web (WWW). This history of literary/technological expression—an array of poetry directly influenced by computer processing and manipulation—follows a more or less temporal continuum, while retaining distinct stylistic groupings. Aside from a few essays that skim the surface of its history, digital poetry produced before the advent of the WWW has not been introduced to a larger audience in a probing, concerted way. My study seeks to reveal the development, range, and construction of digital poetry, as well as what constitutes the genre.

Most significant, this book demonstrates that digital poetry's foundations, mechanically and conceptually built in the decades *before* personal computers, were firmly established by the 1990s—*before* the WWW came into existence. This observation is significant, and this present study is important, because the early history of this burgeoning genre is almost completely unknown, and the present state of digital poetry cannot be fully understood without a sense of its origins. I wish to provide, then, some deeper idea of what digital poetry has been about.

As explained in detail in the section "Discussion of Genre" below, digital poetry is not a singular genre or "form" but rather a conglomeration of forms that now constitutes a genre even though the creative activity itself—in terms of its media, methods, and expressive intent—contains heterogeneous components. Digital poetry is an evolving process, employing various

techniques that began to form well before the advent of the personal computer and continues to refine itself in today's WWW environment. Poets continue to explore a variety of computerized techniques, from interactive installations to randomized and visual attributes. Despite the technological advancement and popularization of computers, my research shows that most approaches to the production of digital poetry realized in the wake of the WWW's emergence were at least roughly cultivated before the advent of the global network.

Poets initially used computer programs by synthesizing a database and a series of instructions to establish a work's content and shape. By the mid-1960s, graphical and kinetic components emerged, rendering shaped language as poems on screens and as printouts. Since then, videographic and other types of kinetic poems have been produced using digital tools and techniques. Beginning in the 1980s, hypertext (nonlinear texts that are intrinsically, mechanically interconnected) developed in sync with the increasing availability of the personal computer. A few other experimental forms, like audio poetry, appeared along with new technical advancements. When the WWW emerged, multimedia, transcontinental, hyperlinking poets began to spark expression through interconnected motherboards; the status of the art form has risen with the increasing affordability of computing and capabilities of network technologies. Only a few works of digital poetry titles are now circulated *offline* (few people are publishing digital poetry on diskette or even CD-ROM). The copious amount of material delivered to readers through the WWW is strong evidence that computers and telecommunications networks heighten the audibility and visibility of this strand of contemporary poetry.

In a 1996 posting to the *Hypertext Literature* listserv (ht_lit), pioneering digital poet Robert Kendall writes that "any time you give artists powerful new tools, new artistic visions inevitably spring from them. And that's what art is all about" (Untitled online posting). Consider Kendall's presumption that a new technological apparatus leads to new artistic visions in relation to Ezra Pound's dictum that a poet's responsibility in the modern era was to "make it new" (which he borrows from Confucius and restates in *The Cantos* and a 1934 book given this title). Could it be true that the process of enabling the projection of artistic visions is as easy as using new tools for composition? In a 1970 essay that appears in the book *Art and the Future: A History/Prophecy of the Collaboration between Science, Technology, and Art* (1973), Douglas Davis quotes a Michael Noll essay that proclaims, "The

computer has only been used to copy aesthetic effects easily obtained with the use of conventional media, although the computer does its work with phenomenal speed and eliminated considerable drudgery" (111).[1] Could it be true that digital poetry is, in fact, a *simulation* of poetry? In many regards the purpose of my book is to investigate what sorts of "newness" are brought about by digital technology and—to a lesser degree—what associations or relationships exist between these "new" formations of poetry and those that have existed previously.

Mechanically, it is true that a contemporary poet has novel technology at her or his disposal, but, as this study will show, many poems available on the WWW cannot be classified as "new" because the digital techniques used to present them were cultivated in the decades prior to the WWW. Likewise—as noted by investigations such as Loss Pequeño Glazier's *Digital Poetics: The Making of E-Poetries* (2002)—digital poets conceived these works with the same poetic and theoretical practices used by artists who worked with nothing more than paper and ink. The high-tech composition and presentation of poetry, using the latest available means, has, of course, reflected a sense that something innovative was underway, and many artists working in the pre-WWW period can rightfully claim that they were doing something mechanically original. This is obviously true in terms of surface aesthetics—particularly the development of kinetic works—but nothing particularly new has emerged since the initiation of the WWW. Indeed, contemporary digital poetry merely refines earlier types of production and disseminates works to a wider audience via the network.

The aesthetics of digital poetry are an extension of modernist techniques. Early digital poems can be conceptually interpreted as searching for their essence or as striving to make their essence apparent, as did modernist endeavors. Yet on a theoretical level these works are in many ways typical of the postmodern condition of text; that is, the work illuminated in this book emerges during a period when poets, critics, and others were newly exploring the relation of language to the world, paying particular attention to language as a system with variable properties. Randomly generated digital works, works that appear in sequences (either static or animated), and many hypertexts (which are typically presented as a series of interlinked fragments) embody the type of postmodern conditions of textuality put forth by Derrida, Baudrillard, Foucault, Deleuze and Guattari, and others. When we encounter the various forms of digital poetry, we see a representation of our highly technological world; within the myriad types of expression, the

artist often seeks to expose, and sometimes subvert, the various binary oppositions that support our dominant ways of thinking about literature (and, perhaps, about communication in general). The deconstructive contention that texts intrinsically contain points of "undecidability," which betray any stable meaning that an author might seek to impose on a text, is certainly a feature of many digital poems.

In *The Postmodern Condition: A Report on Knowledge,* Jean-François Lyotard proposes that contemporary discourse can make no claim to finality, even if it does not seek to put an end to narration. He argues that the computerization of society, which shifts emphasis from the ends of actions to their means, has made metanarratives (as a means of legitimizing knowledge) unnecessary and intolerable because technology is self-legitimating (108). Cultural transformations (especially the growth of technology) have altered the historical tenets of science, literature, and art. His pluralistic, relativist views suggest that art is no longer required to seek or produce truth and knowledge, and may abandon standards and categories. The text's identity as a computer form, containing expanded semiotic operations, often subjects the reader to an unfamiliar type of reading. In negotiating the interface, a reader's experience involves thoughtfully participating in the textual activity and thereby experiencing the poem on compounded visceral and cognitive levels.

As William S. Wilson writes in the essay "And/Or: One or the Other, or Both," postmodernism "was invented when language looked like a game, or like several games with resemblances among them, and when the rules for words, or the rules for playing games with words, required that uses of a word be arranged in an array that has a lot of play—to-and-fro movement—within it. These oscillations might not look as serious as some more stable older thought, and the vacillations that accompany undecidability can resemble mere decisiveness. But undecidability is not an incapacity, it is a condition of mathematical logic" (11–12). Because literature has now joined forces with mathematics and computer science, as well as other art forms, it foists an entirely different set of circumstances on the reader, which will be made clear by the works discussed below.

I came to be involved with this area of research as a result of my decision to pursue a PhD in English during the 1990s. While working on bachelor's and master's degrees (also in English) at the University of Virginia during the mid-1980s, I started to publish my poems and cofounded a small press (We Press) that published books and literary arts magazines in printed,

audio, and video formats. My activities in this area expanded when I was exposed to (and began to practice) nondigital multimedia performance during a summer of study under the tutelage of Allen Ginsberg and Anne Waldman at Naropa Institute in 1986. When I arrived at the University at Albany in 1992, Don Byrd gave me a single order: to continue what I had been doing, but use computers and the Internet to produce poetry instead of Xerox machines and recording studios, and then write about it. This shift to a more technologized approach to creativity had a strange allure, and I believed that making use of new equipment could be rationalized by the fact that poets throughout history have always made use of whatever technology they have at their disposal. I began to investigate how poets had used digital technology, and this book is largely the result of my research and musings over the last ten years on the subject of digital poetry and the poetics of that form. Time and helpful feedback from mentors and colleagues have enabled me to establish a more determined agenda and focus, as well as conduct research that I was not able to undertake as a graduate student.

Today digital technology advances poetry into dynamic areas that were at least partially available in the prehistoric and even pretechnologic era. Attaining randomized effects with technological components and processes, digital poets reprogrammed unconventional analog prototypes—like handmade Dada poems—as well as more orthodox forms such as sonnets and haiku. Digital poems can be enormously complicated (containing video, layered images, and so forth) or very simple. Sophisticated productions can be technically demanding or use elementary computers and techniques. This book aspires to discover, discuss, and present a history of poems created through or because of the computer, and to a lesser degree it seeks to link that history with precomputerized poetry.

Discussion of Prehistoric Theme

Designating the literature under investigation as prehistoric imparts a cultural and an aesthetic suggestion rather than a literal or absolute theoretical assignation. This study examines the material contents of digital poems from their emergence until the point they coalesced into a genre—or at least until a more widely practiced art of multiple forms after the WWW brought disparate types of work into one network.

Gathering these materials under the title *Prehistoric Digital Poetry: An Archaeology of Forms* serves several purposes. Charting the lineage and ana-

lyzing selected findings proposes that these precursors to contemporary works fundamentally delineate parameters of the genre. The work discussed here is prehistoric because no masterpieces or "works for the ages" emerged to lodge the genre in the imagination of a larger audience. In fact, only a small audience became interested in or knew of most of the productions I will discuss. Digital poems made in this period were part of a substratum of contemporary art, overshadowed by the abundance of dynamic works produced by writers and artists whose more accessible surfaces (such as books and galleries) gained much broader exposure. Only a few of the works discussed below were strong enough to garner temporary attention at that level, usually in events that focused on computer art. Even if most of the world did not notice, these poems are important because they established the foundations of the genre.

This research is a type of archaeological excavation because technologically based works become outdated very quickly and are often difficult to obtain or operate. Exploring works produced with obsolete programs and platforms involves more than clinical scholarly research; my archaeology required that I not only ferret out obscure written texts but also search for old programs, hardware, and software. In some instances I had to consult with experienced programmers who helped me understand what the programs had done (and had not been able to do) by examining the code. This book is an archaeological study because my research was such; on finding a reference to a work, I would attempt to locate it, consult with its author or someone familiar with it if possible, read the poetry, then find a way to fit it into a context with other works uncovered in the process. Initially, my primary interest was hypertext (and the recognition that hypertextual dynamics share common ground with poetry's intertextuality, whereby texts exist in open relations with other texts), so I acquired as many publications as possible and set out to sift through them to find elements or expressions that contained poetic value. I then proceeded to do the same thing for each of the other major modes of digital poetry (text generation, visual works, and hypermedia).

For the most part I perform my own instinctive and intuitive "readings" of works and refer to outside materials only when they are pertinent toward building a framework that enables a more thorough understanding of a piece or characteristic of the genre. Fortunately, my archaeological "dig" is not too ancient—I can posit a realistic, or at least reasonable, portrait of the

genre's foundations, either via direct experience with the materials themselves or by reliable first- or secondhand accounts of the works.

The dawning of the WWW (launched in 1991 but not used creatively until 1995) is a significant point of demarcation, as it signals a profound and historical shift in the way digital poems were made available for viewers.[2] Prior to this moment multimedia, hypertext, and computer-generated works had been discretely produced "offline." The massive growth of the Internet and WWW introduced artists to each other's work. Search engines, browsers that enable hearty multimedia capabilities, archival Web sites, listservs, and even chat rooms have increased the visibility, consumption, and knowledge of the form—a global community has become possible.

Growth of the WWW undoubtedly benefits and increases the visibility of digital poetry, which had been a remote satellite of literary and/or artistic culture. Today many more people are involved with the composition of materials on the WWW, so the form has grown and works have been refined. Nonetheless, the initial endeavors represented in my study are important because they allow us a clear-eyed look at the basic elements, procedures, and historical approaches to the composition of digital poetry. The works presented here, which are in many ways at risk of extinction, will give anyone a sense of the earliest constructions and the ongoing mechanics of a developing technological literature and, more broadly, a culture.

Structure of This Book

This book begins with a time line outlining historic documents and artistic markers within the genre and contains four sections regarding computer programmed texts; visual works (static and kinetic); hypertext and hypermedia; and alternate approaches to using digital technology, including early Internet publications and audio productions. This arrangement intends to illuminate what digital materials designated as poetry—engineered by poets, writers, or scientists experimenting in a new expressive medium—are made of; each chapter introduces some of the earliest works produced in the genre, investigates aesthetic issues from each phase, and examines the contents of the poems. Digital poems are explained in detail in order to provide readers with a sense of the aesthetic and mechanical experience of encountering these documents. Each chapter concludes with observations on the form in light of the materials presented, in order to pronounce the con-

tinuum of production, possibilities, and problems within digital poetry. Organized broadly, this surgical explication is arranged chronologically. I select several works from within each period as pertinent examples and reference every work I encountered in my research.

The first section of the book examines text generation. Exploration and discussion of graphical works (both kinetic and static), hypertext/hypermedia, and alternative forms follow, set into subsections by the poet-programmer's type of production. The methods, programs, or software used to develop works are introduced as each style of production is addressed. I have devised general typologies for each style to delineate the general areas of investigation and explain and analyze how titles of digital poetry made use of successive digital technologies as the means became available. These works represent the beginning of this gradually developing area of textuality. The reflective, yet speculative, concluding chapter deliberates on the range of effects, conditions, limitations, and potentials of early digital poems. I further discuss digital poetry's impact, effectiveness, and interactive possibilities and offer a context for future works.

To maintain the book's focus on computer-enabled poems, I have appended two essays—one on "code" poetry and one on holographic poetry—that address mediated poetry's emergence alongside digital poetry. These forms not only use computer techniques but essentially share the same experimental motivations as digital poems. Thus, all the works appearing in the book proper stem from computer operations, and those discussed in the appendices are closely related but not presented on computer screens.

In early digital poems one can see many imaginative approaches toward inventing modes of expression with computers. The genre has clear and persistent boundaries, despite advancements in hardware, networks, and software. In addition to creating an apparatus that informs a larger audience about these original endeavors (and perhaps inspiring new, derivative works), I aspire—by categorizing these works—to signal the directions digital poetry has taken, while responding to its limitations and possibilities. Poetry discussed in this study sets the stage for contemporary works and can be used as a reference point for future forms. By compiling a significant amount of information into a single volume, I intend to facilitate the research of future scholars of the various forms that encompass the genre of digital poetry. I also hope to provide a reasonable starting point for authors of future electronic texts, who may consider these historical designs while

defining and refining their craft, and offer them a sense of a larger creative history.

By giving these obscure works more exposure, making them known to a larger audience, I do not mean to suggest that they are masterful. While many works emit the effects Pound declares as the bases for poetry (phanopoeia, melopoeia, logopoeia), only a few approach "great literature" by the standard he advances in *How to Read* and *ABC of Reading:* "language charged with meaning to the utmost possible degree" (28). I wish neither to argue for the popularization of these digital poems nor to promote exclusively their authors—although I do consider these experiments relevant steps in the growth of digital writing because they establish the aesthetic foundations for many subsequent works. Today's wildly animated, WWW-based titles possibly offer more to viewers in search of dynamic text and are better applications of the technology that was previously available. Even if this is the case, my purpose is to establish the common and concise foundations for digital poetry. Unveiling these texts intends to contribute to the further understanding and development of the form. Describing how each work operates, and how the different types of work may be seen to form (or "fit" into) a poetics, allows me to elaborate on a range of approaches to expression attempted and achieved by digital poets. Thus, the dominant aspects and dynamics of digital poetry are introduced and discussed.

Speculation about the poetics of digital poetry has overshadowed detailed readings of the works, which are in themselves fully capable of conveying the evidence for literary and other historical foundations. In general, I remain determined to flesh out the actual works in order to demonstrate the formal and technological roots of contemporary productions. At the same time, I realize the value of establishing a literary framework and of bringing into the study the historical associations of these works, which—in addition to being outlined immediately below—are referenced and incorporated into the narrative of the chapters that follow.

Relationship between Poetry and Digital Poetry

In his preface to the anthology *Computer Poems* (1973) Richard Bailey identifies four poetic tendencies that influenced the works included in the collection: "concrete poetry," "poetry of sound in verbal orchestrations," "imagistic poetry in the juxtaposition of the unfamiliar," and "haiku."[3] The

poems in the anthology reasonably support his (somewhat) dated viewpoint, but there is a correspondence between poetry and digital poetry.

Making connections between digital and historical (i.e., printed or purely oral) poetry is helpful for those unaware of recent developments in the medium, and at this early juncture of the digital era, critics necessarily use frameworks derived from past movements as a foundation.[4] For instance, Glazier's volume, *Digital Poetics*—the first full-length study of the genre—is largely dedicated to this pursuit.[5] Glazier outlines a history and infrastructure of "e-poetry" as it is situated within a lineage of innovative literature written in the past century (Guillaume Apollinaire is the earliest cited artistic marker). *Digital Poetics,* "an introduction to the making of the new digital poetries," introduces the experimental domain and general attributes of the genre, which in Glazier's view directly follows Language poetry in the line of inventive verbal arts of the twentieth century (1). He does not analyze work that has actually been produced thus far but rather intimates the capabilities of the digital poem and shares his observations as a producer of such works, often connecting them to other forms of literary production. In *Fashionable Noise: On Digital Poetics* (2003) Brian Kim Stefans extends lively considerations regarding numerous literary and artistic figures he sees as precursors of *cyberpoetry* (a classification he uses throughout his book), including the concrete poets, Walter Benjamin, Ian Hamilton Finlay, members of the Toronto Research Group, and many others. Stefans, like Glazier, primarily uses examples of his own work (which appears in fragments, accompanied by dozens of footnotes that adorn his ornate perspective). In contrast to these respectable authors, I prioritize the examination of the textual and technological particulars by introducing completed works and illustrating their properties, once I have established a historical literary context.

As partially indicated by Bailey's observations, digital poetry is even more pluralistic in the creative (poetic and poetics) influences it embraces than in terms of the media it employs and genres it fuses—by typical standards, it is a primarily postmodern endeavor. Many poems, however, do embody expressive potentials realized on the page by previous generations of poets; it is not difficult to find stylistic elements associated with modern and postmodern poetry in many digital poems. These historical associations cannot be so simply stated, and, from my point of view, the historical interconnections have not been comprehensively attended to in the abovementioned volumes (nor will they be so here, though I intend to cast at least

a wider net into this critical sea). Each stylistic phase of the genre's prehistoric era contributes different dimensions and requires explication in order to locate digital poetry on the continuum of literary history.

It is not difficult to build a context for digital poetry using works and discourse from the modern era, although it is clear that digital poetry's stylistic foundation is first established by premodernist literary beacons. French symbolist writing, particularly Stéphane Mallarmé's late-nineteenth-century poem "A Throw of the Dice Never Will Abolish Chance" (1897), is unquestionably an artistic antecedent that directly impresses upon the disruption of textual space and syntax found in digital poetry. The variations in typography, incorporation of blank space, and the liberal scattering of lines often found in digital poems can be discerned as having roots in Mallarmé's work (which also strongly influenced the development of concrete poetry in the 1950s). Such patterning has been extended by the addition of interactive and kinetic components. Mallarmé's importance was previously acknowledged (albeit briefly) from a different perspective in Bailey's preface to *Computer Poems,* which largely featured randomized poetry created by computer programs: "Mallarmé published a slogan for modernism: A throw of the dice will never abolish chance. Chance is not abolished by the computer's randomizing power but is re-created in different terms. The poet-programmer finds this power a tool to create a new set of dice, multi-faceted and marked with elements of his own choosing." Here Bailey privileges the power of Mallarmé's thematic content, although I would assert that the aesthetic properties of "A Throw of the Dice," particularly its visual attributes and the fact that it requires readers to make decisions about how to read the poem, are equally important, if not more so.

Mallarmé is but one premodernist whose atypical form of poetic presentation has influenced the mechanics of digital poetry. As divulged and reconstructed in the body of work that appears on Florian Cramer's *Permutations* WWW site, the programmed permutation works that emerged near the outset of digital poetry have even earlier predecessors in combinatory works that date back as far as AD 330. In the essay "Combinatory Poetry and Literature in the Internet" Cramer defines combinatory poetry as "literature that openly exposes and addresses its combinatorics by changing and permuting its text according to fixed rules, like in anagrams, proteus poems and cut-ups." Samples and reinventions of writings by Optatianus Porphyrius (*Carmen XXV,* fourth century AD), Julius Caesar Scaliger (*Poetices,* 1561), Georg Philipp Harsdörffer ("Fivefold Thought Ring of the

German Language," seventeenth century), and other works are capably presented on the *Permutations* site, illustrating how the mechanics of contemporary (and prehistoric) digital poems have roots in works produced several centuries ago.

The first works of digital poetry, text-generating programs written in BASIC, TRAC [Text Reckoning and Compiling] Language, APL [A Programming Language], FORTRAN, and other now-ancient programming languages, predominantly reflect the modernist propensity to synthesize disparate voices and cultural details.[6] Pound's *Cantos* and T. S. Eliot's *The Waste Land* achieve this effect, as Jay David Bolter observes in the first edition of *Writing Space,* by replacing poetry's narrative element with "fragmented anecdotes or mythical paradigms" (131). For example, the early "Tape Mark" poems by Nanni Balestrini (1961) appropriate texts by Lao Tzu *(Tao Te Ching),* Paul Goldwin *(The Mystery of the Elevator),* and Michihito Hachiya *(Hiroshima Diary);* such reinscription is a common trait of digital poetry. These poetical collage techniques are reminiscent of *The Cantos* and William Carlos Williams's *Paterson,* which juxtaposes poetry, the language of the people and natural world of his locale, and correspondence with other writers into a sequence of writing encompassed in the poem. Like Williams, Pound, and Eliot were in their era, digital poets are confronted with social and artistic fragmentation in the world around them and—whether consciously or not—use the atomization and hybridization of texts to both subvert and reflect the complex of cultural information. Authors working on the page and screen in the postatomic era use fragmentation to legitimize fragmentation and challenge the stability of language as a point of meaning; this process of reassembling disparate pieces via technology offers the means to impart a sense of coherence.

Early works in *Computer Poems* and elsewhere show great effort (in terms of preparing code and selection database material) to give digital poems a sense of cohesion.[7] Despite the random effects imposed on the poems by complex programming, one can find an intentional plotting of associated fragments of language and thought, similar to those found in modernist works. Another style—also revealed on Cramer's site—emulates the Dadaist practice of reordering the words of one text in order to make a new text, which has been called "matrix" poetry by several practitioners (e.g., Pedro Barbosa, Robin Shirley, Philippe Bootz). This approach invites and permits poets to use previously composed texts within new, perhaps seemingly unrelated, contexts, as Marcel Duchamp did (using other premises) in

his "readymade" artworks. The principles involved with the *poesis* of such works—especially in works that regenerate themselves—move away from creating singular artifacts; such models of expression are, as Peter Bürger has remarked, "not works of art but manifestations" (Perloff 5).

Modernist poets also imparted visual attributes to their work, although adding visual components to poetry was not new (see, e.g., William Blake). The most glaring examples of this trend are Pound's interest in (and implementation of) ideograms (which also asserts the applicability of scientific method to literature), Apollinaire's "Calligrames" (which shape language into discernible images), Charles Olson's "Projective Verse" ("composition by field" with attention to breath and the extension of perception), as well as various methods used by concrete, constructivist, Dadaist, and futurist poets.[8] While visual design is a characteristic of many digital poems, the relationship between graphical digital poems and the aforementioned models often exists on the surface but is not intrinsically supported by shared ideologies or methods, especially in contemporary forms where elements are not always fixed into place. Fragmentation and disruption of sensibility through the images produced—attributes generally associated with postmodern productions—were practiced from the very beginning. Graphical digital poems—which use many different approaches and take on many different forms—emerged in the 1960s and have appeared steadily ever since. This advancement, which overtly and visually foregrounds material aspects of language, represented significant aesthetic growth in the development of digital poetry.

Poems by artists preoccupied with visual elements are reminiscent of certain concrete poems, in that they use atypical and oversized lettering, but the connection is closer in graphical philosophy to earlier shaped poems by Apollinaire in the "Calligrammes" or George Herbert in "Easter Wings," where the shaping of the poem is an embodiment of its content. The "tension of things-words in space-time"—which is one of the theoretical and artistic objectives of concretism stated by Augusto de Campos in the "Pilot Plan for Concrete Poetry" (referred to in Emmett Williams's *An Anthology of Concrete Poetry* [n.p.])—is sometimes but not always perceived in digital works. Materials that directly associate object and meaning do not foster the same level of "tension" in the reader as the more oblique communication strategy of concretism.

In kinetic poetry we encounter a style of work that has not been previously produced. Though a mechanical possibility through the use of film,

poetry was not literally put into motion, probably because of a lack of access and the expense of film equipment and processing, as well as a set preconception of what film as a medium entailed. Videographic works and devices used to make animated poems have gradually become available during the past two decades. These techniques have galvanized a synthesis of media in the construction of poetry, in which meaning is produced through the recognition of differences between instances in the chain of preprogrammed sequences. Poems in this style thus impart a type of deconstruction through their shifting, activated rhetorical structure. As E. M. de Melo e Castro writes in his essay "Videopoetry," "Poetry is always on the limit of things. On the limit of what can be said, of what can be written, of what can be seen, even of what can be thought, felt, and understood. To be on the limit means often for the poet to be beyond the frontier of what we are prepared to accept as being possible" (140). Building a context for digital poetry within a broader historical spectrum, Melo e Castro outlines the central elements of this neoteric form, which emphasizes, as poets have throughout the ages, "the importance of phonetic values in oral poetry, of scriptural values in written poetry, of visual values in visual poetry and of technological values with computer use and video for the production of poetry, and not only for simple repetitive and non-creative tasks" (141). Melo e Castro sees videopoetry as an inevitable response to the challenge of new technological means for producing text and image. In some instances messages are succinctly and directly transmitted, but more often the combination of words, symbols, and images requires viewers to decide what this conflation or concatenation of elements means. As Marjorie Perloff notes, such conditions for textuality, which often blur the boundaries between poetry and prose, or literature and art, have been described by Richard Lanham as "digital equivalency," meaning that, "we can no longer pursue literary study by itself: the other arts will form part of literary study in an essential way" (Perloff 17). In the essay "The Electronic Word" (1989) Lanham writes that "the personal computer itself constitutes the ultimate postmodern work of art. It focuses all the rhetorical themes advanced by the arts from Futurism onward" (Perloff 17). These convincing observations, as well as other theories stated above, make it difficult to consider most digital poetry as anything but postmodern, although debates on the matter continued throughout the 1990s.

Hypertext theorists Bolter, George Landow, and others have argued that hypertext represents poststructuralist conceptions of textuality. As I sug-

gested above, however, hypertext and hypermedia poems (mechanically nonlinear texts) can be critically identified as adopting both modern and postmodern elements, depending on how the author structurally organizes the texts. In *Hypertext: The Convergence of Contemporary Critical Theory and Technology* Landow adopts Roland Barthes' concept of "lexia," or blocks of text, as a model for hypertext in the first major study on the dynamics of literary computing and claims that such a "galaxy of signifiers" and decentralization of text significantly alters the act of reading (3). Hypertexts, however, are often self-contained, despite the fact that they consist of many fragments. The links embedded, and maps of texts provided, are not used expansively but rather referentially (toward building overall coherence), despite the narrative and thematic rupture brought on by the linking mechanism. In some instances, such as in Jim Rosenberg's *Intergrams,* the combination of atypical, fragmented language and an original approach to syntax effectively blurs the distinction between author and reader, but in most cases the reader is still more a consumer of the text than a producer (even if he or she has to make cognitive connections in order to determine meaning). The often disorienting attributes of nonlinear texts, which do not always cohere, at the very least flirt with conceptual paradigms put forth in both modern and postmodern poems.

In other writings that conceptualize and promote historical models for hypertext and hypermedia Landow further considers the logic and thinking of modernist literature and hypertextual modalities, arguing that hypertext blurs the distinction between what is "inside" and "outside" a text in a manner comparable to *The Waste Land* (63). Critics have cited hypertext's disorienting properties as a form of aesthetic pleasure and propose that discovery, invention, and interpretation often begin with a sense of confusion, aesthetic experiences that are common to both modernism and postmodernism. In "Hypertext Heaven," an essay included in his book *The Metaphysics of Virtual Reality,* Michael Heim, who has criticized hypertext's disorientation and cognitive overload as a disadvantage, likens the hermeneutic structures ("nets of allusions") used in hypertext to those embodied in James Joyce's *Finnegans Wake,* which he calls, "the ne plus ultra of nonlinear and associational style, a mess of hidden links and a tangle of recurring motifs" (31). The connection between digital poetry and modernist technique is by now clear, though the merits of such an embodiment are not beyond question.

Avant-garde critiques of modernism can also be applied to the opera-

tions of digital poetry. For instance, in the essay "Modernism and Postmodernism: Approaching the Present in American Poetry," David Antin writes that "it was the specific claim of 'modernism' to be finally and forever open, but now that its future has receded into the past, it can be had as a sealed package whose contents have the exotic look of something released from a time capsule" (99). Some of the negative criticism levied at postmodern techniques is equally useful in determining what sorts of pursuits digital poets may find most effective. For instance, toward developing a dialectic in *Radical Artifice,* Perloff reiterates Fredric Jameson's observation that contemporary pastiche methods are appropriate because "in a world in which stylistic innovation is no longer possible, all that is left is to imitate dead styles, to speak through masks and with the voices of the styles in the imaginary museum" (9). Thus, one of digital poetry's major challenges—which has not always been embraced, especially in the prehistoric era—is to circumvent historical approaches to expression. Other artistic influences and models can be developed to cultivate frameworks that advance discourse beyond ordinary historical paradigms. In my view most hypertexts possess a sealed (or contained) tendency, which is likely rooted in the form's relative newness. We cannot, however, presume this will be the ultimate condition for digital poetry, given possibilities for the "open" structuring of texts using new media and networks. If it has not yet reached its full potential, the openness to which discursive writers aspired in print may very well be digitally accentuated in the future.

John M. Slatin's essay "Hypertext and the Teaching of Writing" describes hypertext as "an essentially literary concept" and observes, "The problems hypertext poses for the reader are very similar to though not precisely identical with the problems posed by poetry—especially 20th-century poetry. (These are problems having to do with reference, and with the nature of the relationships between one text and another)" (112). A hyperdocument potentially consists of many documents, and because the details that must be attended to are qualitatively different, Slatin stresses the need for creators of these sophisticatedly layered texts "to pay even more conscious attention to small details *and* to general structure than does an author of a more conventional document, and must do so at an earlier stage in the composing process" (113). Slatin recalls how the range of Coleridge's reading (i.e., input)—which encompassed natural history, theology, political economy, and the popular press—had an enormous effect on his writing (output), and he remarks that Coleridge's poetry makes so many direct links to other texts

that some critics accused him of being little more than a plagiarist. The modernist poets, for Slatin, redefine poetry in their direct challenge to "the strict linearity of print" (114); he describes how Pound develops his concept of vorticism in *Gaudier-Brzeska: A Memoir* by devising an aesthetic strikingly appropriate to hypertext based on the unconventional juxtapositions of discrete images into "a radiant node or cluster . . . from which, and through which, and into which, ideas are constantly rushing" (114–15). Digital poetry (and other forms that use multiple texts) embody the concept of intertextuality and show that any text has the potential to be a "collectivity of texts . . . composed of and by other texts," which makes demands on the reader (115). Slatin's essay describes his treatment of Marianne Moore's poem "Poetry" as a hyperdocument in order to illustrate the span of the poem's associations. The electronic version of Moore's poem contained links to previous drafts, notations from Moore's notebook entries, and other texts embedded within the poem, all of which reveals that the poem is not as direct as a naive reader might presume, even though on the surface it appears to be much more straightforward and direct than Pound's and Eliot's poetry. Slatin writes, "The fit between the methods of the poet and the capabilities of hypertext is very close," meaning not only that hypertext is a useful tool for revealing the intertextuality of poetry but that negotiating and producing hyperdocuments are complex processes (120).

Developments since the appearance of computer networks, such as collaborative activities, the establishment of archives, as well as online communities and publishing, also hearken back to earlier historical practices or efforts put forth by poets as analog artists. For instance, the "Mail Art" movement, surrealist "exquisite corpse" writings, organizations (such as Poets House or the Poetry Project in New York City), and small press publishing taken up in previous periods, which may (or may not) have operated on a smaller scale, all served purposes similar to network initiatives. The attention given to creating innovative audio works recalls both the earliest iterations of poetry, in which language was exclusively oral, and performance poetry that has been practiced since Dadaism.

Despite the modernist sensibilities and historical influences reflected in digital poems, it is necessary to reiterate that postmodern effects have been present in this genre from the very beginning. Digital poems are more inclined toward abstraction and are largely depersonalized, especially as the media used in composition has become hybridized. While many authors vigorously attempt to produce poems that make grammatical and human

sense, certain artists, like John Cage and Jackson Mac Low, employ narrative strategies that are intentionally unfixed or utterly fragmented as a result of the media implemented in composition.[9] Randomization, patterning, and repetition of words, along with discursive leaps and quirky, unusual semantic connections, are almost always found in digital poetry, though sometimes these effects are so amplified that the poems would not be considered poetry by someone using traditional definitions.

Many modernist methods resonate closely with digital projects, especially those involving text generation and ergodic works (those to which a viewer is able to contribute her or his own language).[10] Positing contemporary endeavors as a progression of modernist pursuits is reasonable, but subsequent critical developments and modes of understanding are also relevant, particularly the postmodern practice of deconstruction, in which a text often challenges intelligibility. Modernist works are meant to cohere in the end—and although one can find similar authorial or programmatic intent in some digital poems, I will introduce other examples that completely disregard such intent, focusing more on illustrating a theoretical proposition. Digital poetry is not a fixed object; its circuitry perpetuates a conversation. Ideally, as in the case of many text generators and other forms of interactive work, the poems can perpetuate themselves. Poetry is a socially constructed art form, always situated within other texts (not limited only to poems) and extended by readers. Technology allows, as Slatin writes in the essay "Is There a Class in This Text?," a "new set of relations . . . between all members of the group and the body of material whose meaning, it now becomes apparent, we are all there to construct. Knowledge ceases to be an artifact (or to be embodied in artifacts) and becomes instead a process; it is dynamic rather than static, not to be confused with mere information" (33–34). Meaning and significance are not completely dependent on the verbal material itself; they are formed in the mind of the reader, who synthesizes various tiers of influence (inputs) and, potentially, extends them (outputs). As Eric Vos writes, in new media poetry "communication becomes negotiation. . . . The merging activities of poet and reader fulfill poetic communication, and in that process a poetic text is created" (227).[11] Vos's view echoes the sentiments of Landow and others who have already determined that both the reader's and writer's approach to literary composition has evolved in contemporary society.

In the essay "We Have Not Understood Descartes," André Vallias encapsulates the essence of digital poetry as literature in a broad sense: "It seems

to include within itself and to transcend technologically a whole series of poetic manifestations which started out with the avant-garde movements of the twentieth century, such as visual poetry, phonetic poetry, performance poetry, etc. Interactivity allows a work to be modified according to internal criteria (those defined in the programming language) and also according to the repertoire and interests of the reader; it opens up a field of unlimited dimensions for poetic research, and provokes an irreversible subversion of the traditional relationship between author, work, and reader" (157). In this passage Vallias provides a useful summary of the enterprise of digital poetry in relation to historical forms, simultaneously advancing views on its most potent characteristics.

Vos's essay "New Media Poetry—Theory and Strategies" also illustrates the dynamics common to poetry in its archetypal form and poetry created through digital means. Vos quotes a passage from William Dickey's essay "Poem Descending a Staircase: Hypertext and the Simultaneity of Experience," in which Dickey celebrates the "tentative, fluid, changeable" elements of hypertext and qualifies the shared mechanics and ramifications of poetry united with digital media (Vos 218). In Dickey's view these are "multiplicity of perspective, variability of the structures and vocabulary of language, including the extension of the idea of language to non-linguistic elements . . . , rejection of a single rhetorical authority and of linear causative organizations as providing the appropriate pattern for a work of literary art, admission of aleatory organizations and relationships as more accurate representations of experience, and at least an effective illusion of the simultaneity of experience" (218; ellipses Vos's). The other main attribute of any digital writing, as insinuated by Michael Joyce and made obvious in viewing any digital poem, is its release from a fixed format. A dramatic break from sharing real physical space occurs, whereby the signs that constitute the poetic text are immaterial. Toward developing a fully unifying approach with the multiple dimensions of digital poetry, Vos uses Bolter's phrase "writing space" in urging authors to maximize the dynamics of the computer screen (218). Contemporary modes challenge authors to avoid looking at any part of these systems—audible, alphabetized, imagistic—as discrete or independent units. Building a widely conceived philosophy of text is the responsibility of authors working with fully integrated (audio/video/alphanumeric) and layered (linked and coded) texts. According to Vos, exploring the interrelationships between these aspects is the quest of new media poetry.

As I will discuss below, poet-programmers have devised numerous meth-

ods to handle computer coding, the (usually) unseen language responsible for formulating a digital poem. As yet, however, methods of creating digital works are dwarfed by the number of forms of written poetry. For example, more than seventy-five unique forms of poetry are discussed in Ron Padgett's *Handbook of Poetic Forms,* a useful guidebook for students of poetry, and many more are reviewed in Alex Preminger and T. V. F. Brogan's *New Princeton Encyclopedia of Poetry and Poetics.* This coverage is unsurprising, considering that these books address poetry across centuries, whereas digital poetry is (mechanically) not yet fifty years old. Though many different variations of digital poems are available, the overall number of general classifications of forms remains relatively small. Computerized literature and artifice are still in their early stages, not long past the prehistoric era, and will become enriched at a gradual pace. The complexities handled by poets using written language, the challenges met despite perceived limits to alphanumeric forms, have just begun to be broached by digital poets. The first decades of the craft established a few models, which may be ultimately regarded as rudimentary efforts when contextualized within any overall history of computerized writing.

Programmed works literally assemble language (if not other media components) to the specification of the programmer; formal, precise programming commands are written to perform particular tasks. The earliest works of digital poetry strictly involved coding because there were no other possibilities, although software increasingly shouldered the burden as the genre progressed, facilitating the poet's conceptual application and aesthetic.[12] As code, the task of handling language is used more often than not to *order,* rather than disorder, poetry. Even if the poet-programmer wishes to instill disorder, the process calls for prescribed stylistic elements. Alternatively, with software the programming generally involves establishing frameworks in which disparate elements—whether the different elements of a visual scenario or files that contain different verbal passages—negotiate with one another or are negotiated by the viewer. As is always the case with its written counterpart, digital poetry relies on the author's senses, thoughts (or inspirations), and vocabulary to form words (which can be accompanied by other media) into expression. As always, the poet enacts language amidst a range of possible treatments.

Some digital poems—even those assembled by a machine—are grammatically flawless, while others completely disregard linguistic conventions. Digital poems do not exist in a fixed state, and they may be considered less

refined as a result of this condition. Any work that exists in digital form is temporary, not only in the sense that it can always be repurposed or edited if the proper programs or software are available, or because of the fact that electronic texts have the tendency to incessantly "replace" themselves (as Joyce observes in *Of Two Minds* [236]). Longevity is not one of the genre's defining characteristics. Programming languages and machines used to produce early works, not to mention the programs themselves, have all but disappeared. Works created on early Apple/Macintosh computers, which were state-of-the-art just two decades ago, require emulation programs to be viewed—if it is even possible to load the media (usually a diskette) onto the machine (beginning in the late 1990s, most computers were no longer shipped with diskette drives, since USB and CD-ROM technology became status quo). Author(s) or programmer(s) of such works presumably have a different sense of authorial control, from which a different sort of result and artistic expectation would arise; consequently, the purpose and production would veer from the historical norm. Because of this shift in psychology and practice, digital poetry's formal qualities (made through programming, software, and database operations) are not as uniquely pointed and do not compare to highly crafted, singular exhortations composed by historic poets. Some will rightfully hold that code and databases or manipulated pools of words (or other media) are more limiting than a powerful mind or that the freedom and capabilities of the mind, and skills that result from refined poetic practice are greater than anything programmed or loaded into a machine (or, for that matter, captured in traditional verse).[13] While this may be proven, I am nonetheless reminded of Olson's potent utterances, in *The Maximus Poems,* that "limits / are what each of us / are inside of" (21). Despite the restrictions of technology, the works I gather under the rubric of digital poetry unquestionably craft language (along with other materials). Using computers, poets can interlink materials mechanically; digital poetry functions to bridge layers of text(s), images, and other effects that result in reaching beyond the machine to affect the reader's imaginative, intellectual, and other aspects of her or his nonvirtual world. These particular, technological capabilities, the "dynamic relation" of "parts to other parts," as Glazier argues in *Digital Poetics,* are akin to Olson's notion of the "field" of writing, "where all the syllables and all the lines must be managed in their relations to each other" (112). The vitality of digital literature relies on how textual possibility and human ingenuity (vis-à-vis programming) are combined to synthesize poetic thought and programmatic expression.

Discussion of Genre

Although I use the term *digital poetry* with purpose and conviction, a brief deliberation regarding the issue of genre is nevertheless obligatory since digital poetry has yet to become a specifically codified or defined form. Unlike hypertext, which has been specifically classified since Theodor Nelson invented it ("non-sequential writing" [*Computer Lib/Dream Machines* 44]), digital poetry, as a unified literary concept, tends to defy precise definition.[14] Labels such as "e-poetry," "cyberpoetry," and "computer poetry" have been used to describe creative work in this area; the titles of both Glazier's and Stefans's books contain the phrase "digital poetics." Both of these collections discuss and question the various labels, and neither book argues for a singular nomenclature. A digital poetics would seem to insinuate the probability of a digital poetry. It is also true, however, that a "digital poetics" neither presumes a digital poetry nor legitimates one. Just as it is conceivable that one could write about the "poetics of virtual reality," only the most rudimentary manifestations of the actual thing are remotely available.

Perhaps the strongest attempt at defining the genre is found in the introduction to *poesis: The Aesthetics of Digital Poetry,* which proclaims that *digital poetry* "applies to artistic projects that deal with the medial changes in language and language-based communication in computers and digital networks. Digital poetry thus refers to creative, experimental, playful and also critical language art involving programming, multimedia, animation, interactivity, and net communication" (13). The authors of this essay further identify the form as being derived from "installations of interactive media art," "computer- and net-based art," and "explicitly from literary traditions" (15–17). In any case *digital poetry* is, for now, a logical label to use in describing forms of literary work that are presented on screens with the assistance of computers and/or computer programming. Digital poetry is—to my senses—an evident, if not abundant, genre, but that does not mean that is what it should be called or that digital poetry is what every digital poet is going to label what he or she does. A poem is a digital poem if computer programming or processes (software) are distinctively used in the composition, generation, or presentation of the text (or combinations of texts). The genre combines poetic formations with computer processing or processes.

Brazilian scholar Jorge Luiz Antonio thoroughly addresses the issue in "The Digital Poetry Genre," in which he posits a convincing and philo-

sophically erudite argument that digital poetry "constitutes a genre itself." Antonio outlines the parameters of poetic works already produced in this "mediatic" genre and identifies the nearly forty names used to classify such inventions that he uncovered in his research, including: "Cine(E)Poetry," "Computer Poem," "Diagram-poem," "Digital Clip-poem," "Digital poetry," "electric word," "Electronic poetry," "Holopoetry," "Hypermedia Poetry," "Hypertextual poetry," "Infopoetry," "Internet poetry," "Interpoetry," "Intersign poetry," "Kinetic poetry," "Net poetry," "New Media Poetry," "New Visual Poetry," "Permutational poem," "Pixel poetry," "Poem on computer," "Poems factory," "Poetechnic," "text-generating software," "3D transpoetic," "Videopoetry," "Videotext," "Virtual poetry (Vpoem)," and "Web poetry." Antonio's list is not definitive, but it provides a sense of the variety of labels that have been employed to distinguish digital from analog forms. Antonio uses Ralph Cohen's definition of *genre* to argue that digital poetry should be defined as a unified form despite its disparate nomenclature. Cohen, in the essay "Do Postmodern Genres Exist?," defines a genre as a grouping of texts that share "combinatorial parts that together produce effects upon readers," stressing the notion that genres are "an entity, of the consequences of particular kinds of combinations, mixtures, multiple discourses, and intertextuality" (20–21). Digital poetry, even though it is rudimentary, aspires—just as works of fiction, drama, or other literary or artistic forms—to invoke the senses and make an impact on what viewers think and feel. At least one other essay, Janez Strehovec's "Text as Loop: On Visual and Kinetic Textuality" (2003), affirms that digital poetry is "a new genre all its own" that incorporates "kinetic/animated poetry, code poetry, interactive poetry, digital sound poetry, digital 'textscapes' with poetry features, and poetry generators." As a genre, digital poetry "intersects the literary avant-garde, visual and concrete poetry, text-based installations, net art, software art, and netspeak."[15] Given these arguments and observations, we can reasonably assert that digital poetry is a genre that fuses crafted language with new media technology and techniques enabled by such equipment.

Not all scholars support this idea. Stefans, who most frequently uses the term *cyberpoetry* in his book, particularly attends to the issue of nomenclature; other books and essays on the subject are less generous with their attention to the matter. Stefans refuses to provide finite conclusions or definitions; he is explicit only in his use of the phrase "computer poetry" (or "CP") to stand for "a textual experience that will be limned based on the source files and the algorithms used for accessing them" to indicate a com-

puter composition that uses program code and a database that consists of words (*Fashionable Noise* 63).[16] Early in his essay "Reflections on Cyberpoetry," which is a revision of T. S. Eliot's "Reflections on Verse Libre," Stefans writes, "It is assumed that cyberpoetry exists, though whether as a subset of poetry or the larger sphere in which literature exists, we are not sure. It is assumed that digital poetry is nearly a school; that it almost consists of certain theories" (*Fashionable Noise* 44). In the next paragraph he claims that digital poetry does not exist and that "this preposterous fiction" (cyberpoetry) should disappear (along with a list of other postmodern trends) into oblivion (44). In his irreverent and wise deliberation on the subject Stefans postulates that "cyberpoetry, as it is, will produce no martyrs, only house guests," a view that could be addressing the fact that many individual approaches to narrative, rather than collective modes of composition, have developed; but Stefans is more likely acknowledging the lack of heroic works, sustained effort, and the transitory status of the form. He states emphatically, "If cyberpoetry is a genuine verse-form it will have several singular positive definitions," but he then claims he can define it only in negatives, what it is not (45).[17] Stefans recognizes that something is happening, though clearly he is not impressed, does not find many works deserving of his remark, and may take issue with my presumption to validate these disparate, sometimes amateurish, works as a genre in their own right.

I understand Stefans's unwillingness to provide a positive—that is, finite—definition of the genre at present, even though relatively secure boundaries are supported by Antonio's essay regarding the digital poetry genre, as well as Strehovec's succinct viewpoint on the subject. My study uses *digital poetry* as a term that represents a spectrum of computerized literary art that can be appreciated in the context of the poetic tradition. Through broad identification and cataloging, multiple types of computerized production can be analyzed as one generality that includes hypermedia, hypertext, computer generation, and other digital manifestations of poetic text. All forms of digital poetry are introduced as a singular genre that contains multiple subcategories, just as the genre of "poetry" contains many different styles (free verse, sonnet, haiku, and so on). Some of these canonical forms have contributed to various manifestations of digital poetry, while other works are poetic mutations that disregard convention. The diverse spectrum of digital poems nonetheless presents a challenge in terms of seeing the form or genre as a unified whole. At this juncture I favor the term *digital poetry.*

Work constructed using "programmable media" (a phrase author John Cayley promotes)—individually and as a whole—could be labeled anything; since no strict appellations exist, an author can choose to call it whatever name he or she wishes. For instance, in discussing the same general sort of works in a recent entry in *The Facts on File Companion to 20th-Century American Poetry,* Catherine Daly intelligently uses the label *cyberpoetry* ("concerned with the machine control of the writing process, delivery of poetry in more than one medium, and machine-mediated interactivity between audience and reader or writer and text" [114]) to discuss the various formulations of digital poetry. Daly sees the genre as divided into three parts: "procedural," "multimedia," and "hypertext and cybertext" poetry (she distinguishes "cybertext poetry" as a form that "involves readers' queries, assumptions, and actions, which change readers' perceptions of the cybertext during the interaction" [116]). Obviously many labels are plausible, each of which acknowledges that digital poetry is a practice—a presentation of expression—that is open enough to include many fringe forms and methods in producing writing and art, as long as they are mechanically enabled by digital hardware and software.

Establishing a precise term with which to classify singularly digital poems—a genre that has been developing in stages—is difficult and the benefits questionable, as these forms, while built on similar principles, are always being technically, culturally, and imaginatively redefined. These *variations* of forms—related by technological agency—encompass many techniques as they serve both to represent (i.e., simulate) classical literature (in programs that implement classical forms or on CD-ROM anthologies of classical poetry) and, more profoundly, to embrace new forms of literature and methods of communicating verbal information. The issues of definition, genre, and labels will perhaps be taken up in every survey of digital writing for some time to come. To maintain focus, I examine texts made with computer processing that identify themselves as poetry, have an overtly stanzaic or poetic appearance on the screen, or contain other direct conceptual alignments with poetry as it has been otherwise known.

Jackson Mac Low, in the introduction to his collection *42 Merzgedichte* in Memoriam *Kurt Schwitters,* describes his work in the volume—which employs computer programs to generate text that is printed out—as "polymedia," and he refers to poems as "literary artworks" (ix). Works discussed below are *polymedia* and *literary artworks;* they are brought together un-

der the rubric of *digital poetry* and viewed as unique efforts related by their one-way-or-another reliance on verbal texts combined with computer technology.

Technological Framework

Although the status of the relevant technology will be introduced at the outset of each chapter in my study, I pause here to sketch out the basic technological history that pertains to digital poetry. During the 1960s authors programmed poems using coding that was previously designed for mathematical and scientific calculation, synthesizing—through new languages—a body of information and instructions via the computer (see note 6). The co-option of computer languages and machinery used to manage information—which is, in essence, the work of the digital poet—did not involve PCs at all. Programs were, out of necessity, run on institutional or corporate mainframes (which cost more than $100,000) without graphical user interfaces (GUI) or input devices such as the computer mouse.[18] Corporate sponsorship, like Bell Labs' support of the famous Artist and Engineer collaboration series "9 Evenings" in 1966, and American Motors' underwriting of the SOFTWARE exhibition (1970), enabled two of the earliest public programs of art produced by digital media in the United States. Thereafter, this situation began to change. Processing and RAM chips were developed, and according to Nelson, there were two dozen computer manufacturers in the United States by 1974 (although as Nelson points out in *Computer Lib/Dream Machines,* a computer that handled alphanumeric data only, with little memory, that could run a program like APL, cost at least $3,000) (36). Word processors from IBM could be rented for $100 a month (14). Douglas Englebart invented the mouse in 1965, but it was not commercially available for years; a keyboard was the only input device until the 1970s, when joysticks and "light-pens" became available on high-end computers.[19] Yet by 1975 someone who was so inclined could assemble a rudimentary computer (then called a "microcomputer") to run programs and perform word processing at far less expense (although displays remained expensive for a few more years). As Hartman reports, in the early 1980s a word processor assembly kit such as the Sinclair ZX81 that included a built-in BASIC language (and to which a printer and a magnetic/cassette storage unit could be attached), cost less that $50 (28). IBM PCs were launched in 1981 and by 1987 many PCs with a GUI, mouse, and display became commercially avail-

able, including Macintosh models that included the hypertext software program HyperCard (which cost about $2,000).[20] In the 1990s tremendous advancements were made in hardware (increased memory, greater processing speeds, and sharper display terminals) and the development of software. Whereas computers at first had minimal storage capabilities, over time magnetic tape storage devices became available, and PCs had their own hard drives and used floppy diskettes for storage (typically holding less than one megabyte of information). By the mid-1990s, CD-ROM technology (small discs that held 700 megabytes of information) was status quo. Printing, once enabled through primitive dot-matrix inventions (1957), was glorified by the development of laser printing and color copiers. Digital products remained expensive, but new forms of verbal art developed nonetheless—the desire to discover creative and expressive purposes for computing machinery was stronger than the (diminishing) expenses associated with the task.[21]

The other major technological development of this period was the formation of a global communications network, enabling the transmission of information, research, and art between computers interconnected through regular telephone lines. At first, circa 1969, this network was known as ARPAnet, and it supported military research; beginning in 1979, the National Science Foundation began to develop NSFNET, which essentially evolved into the Internet in the late 1980s and, in turn, was extended by the WWW as popularized in the mid-1990s. The exact dates and capabilities of these mechanisms are not as important as recognizing their development and impact on the poetic arts, to say nothing of their impact on other areas of human endeavor.

Observations

Digital poetry has always been a multicontinental, decentralized practice, although no examples by Africans or Asians are known from the period investigated here. The fact that works have been created in many languages, and were produced at large distances from each other by people who were not acquainted, has presented many challenges pertaining to the research and composition of this book. An encompassing survey such as this had not yet been written (and has taken me a long time to produce) because digital poetry is daunting in its wide and seemingly disconnected scope, even though the materials discussed in the following chapters are connected to computer processing. Not only is digital poetry an unusual idiom of crea-

tive expression, it is also an idiom that for more than three decades has resisted, as if by definition, the need to embody a singular set of mannerisms in its use of multiple languages (including computer code) and stylistic approaches. Digital poetry has steadily redefined itself with the development of new tools and artistic interests. That it is a largely disorganized global phenomenon makes the task of studying it difficult, though a type of digital poetry culture began to emerge with the international poesis (1992, 2000, 2004) and E-Poetry (2001, 2003, 2005) festivals in Germany, the United States, and England.[22] The WWW sites promoting these events, which contain links to works by artists who participated in these projects, serve as portals to a loose community of digital poets; and an interconnected network, with its own subcultures, has developed gradually. The conditions of communication and professional interaction during the period of my study were less advanced. While it is likely that some of the artists discussed came to know each other through exhibitions such as Cybernetic Serendipity: The Computer and the Arts (London, 1968) and SOFTWARE (New York, 1970), and through anthologies such as *Computer Poems,* works were produced with different programs, languages, hardware, and in locations far removed from one another.[23] Electronic mail networks were not developed until the 1980s; before then, communication between digital poets was spotty. In the prehistoric era, as artists experimenting with computers and poetry came into contact with one another, a greater number of examples of sustained and persevering works are found, as with the L.A.I.R.E. group in France and the connections among writers around the TRAVESTY and DIASTEXT programs. Communities were productive for authors working with computers, just as they had been useful to writers in the past.

There are several valuable reasons to revisit and investigate digital poetry's early efforts. First, much of the work introduced here is largely unknown, except by longtime practitioners and the few writers evaluating it. Lack of exposure might explain the lack of critical interest, though it may also result from the view that, in its infancy, even the most sophisticated works of digital poetry were relatively unspectacular in terms of their creative expression; their impact on literature in general was not overwhelming. Despite the great hype regarding computers during this era, its poetry has been sporadic, although it should be noted that computers had an obvious impact on the aesthetics of books and also made them easier to produce. Of course, commercial and aesthetic successes are not the only means by which to identify and discuss a formal development of artistic innova-

tion. While it may be understood that digital poetry did not receive attention because it was largely unremarkable, only a modicum of validity can be assigned to this perspective given the historical evidence. Many works produced prior to the WWW may appear to be unsophisticated in comparison to the colorful and visceral productions created thereafter, but this superficial reading misunderstands the efforts made in and by the earlier compositions. In my view pre-WWW works are highly original, especially considering that their authors were obliged to create their work without the benefit of historical models (at least, digital models). In the early years of computing, digital poets usually built their works starting at a command line, a prompt from which they were required to formulate everything, beginning at a blank screen by using computer coding only. So in addition to coming up with the idea for a poem, an author had to understand computers and programming well enough to actualize the work. Initially, access to computers was limited to technology specialists, and convenient software packages were unavailable (either because they were not yet invented or were unintended for and inaccessible to artists). Compared with the more advanced works distributed via the WWW today, the earlier materials may be perceived as elementary. Yet from another angle these works can be regarded as some of the most imaginative and inventive, even if they are not as colorful and spectacular as their contemporary counterparts. In any case, precisely the same fundamental building blocks were used in these now seemingly antiquated texts.

The works introduced in the following chapters vary in sophistication, and there are probably others whose deserving work is not recognized. Although this study intends to be as encompassing and inclusive as possible, it would be naive to suggest that it is completely definitive. Though the WWW has increased the profile of the form and connects authors with information (and vice-versa), digital poetry is still a decentralized discipline, despite significant attempts at creating indices of works.[24] Partly because the form resists a singular classification or name, and because many works are now completely obscure or unobtainable, it remains impossible to know everything that has transpired.

Utilizing and relying on more technology than any other era before it, the twenty-first century presents poetry—one of our most intimate and intricate forms of expression—with at least two significant charges. Poetry should remain accessible to its audiences by engaging important social and technological issues, and it should cultivate readers through the production

of stimulating works in all forms. Poetry—stylized language—can allow for innovation and accept adaptations within its forms and tradition. As a craft that remains a vital cultural interest and pursuit during the first decade of the century, poetry is apparently prepared to weather these challenges. At this historical moment, in fact, the fruits of these two charges appear to be interrelated and enhanced by technological advancement. Widespread computer usage and improvements in digital systems and networks have particularly altered the disciplinary sense of what poetry can be, while intimating what the dynamics of literature may contain in the future and how it will be presented to readers.

Digital poetry has developed intensely and rapidly since the 1990s, and time alone will tell which events will prove crucial in the progress of this still relatively young art form. My exploration of the historical and mechanical issues related to literature and digital media reflects how approaches to creating poetic texts are already evolving alongside technology. Aiming to chronicle the opening period of digital poetry, I intend to promote discourse regarding an imprecise genre and to illustrate aesthetic properties of early realizations of poetry. While avoiding certain issues, such as which software programs are "best," or even which individual works are most successful, I aspire to fortify a sense of the textual dynamics that have distinguished digital poetry, illuminating techniques that authors found worthy of consideration and pursuit amidst the new technologies.

1
Origination

Text Generation

Charles O. Hartman, a pioneering computer poet and author of the critical volume *Virtual Muse: Experiments in Computer Poetry,* writes, "The artist's job is to *compose,* to place together in a meaningful arrangement a number of independent elements" (29). In this passage Hartman conveys what the "artist's job" for a poet is and incidentally identifies what works of digital poetry are in their broadest sense: arrangements of self-regulating (sometimes user-regulated) elements. Works discussed in this chapter, and indeed in every chapter, reflect the deep wisdom of Hartman's deceptively simple-sounding observation. Labeled by its authors as "computer poetry" and "computer-poems" (among other terms), works introduced in this chapter were generated by computer algorithm, arranged as a sequence of words or signs and symbols according to a programming code. According to rjs (who published a book of automatically generated poems in 1974), "the sole responsibility of the poet is to provide random input and a coded description of the desired output poem or poems. The poet using the program is freed from the concerns of order and organization, and freed from the need for insight or direction" (n.p.). I began to learn the depths of this lineage of digital writing through Philippe Bootz's essay "Poetic Machinations," in *Visible Language* 30.2, and Hartman's *Virtual Muse,* both published in 1996; I have subsequently seen it traced in several accounts published on the WWW and elsewhere. Essays such as Friedrich Block's "Digital Poetics or On the Evolution of Experimental Media Poetry," Jacques Donguy's "Poésie et ordinateur," and Ambroise Barras's "Quantité/Qualité: Trois points de vue sur les générateurs automatiques de textes littéraires"—each of which can be found on the WWW—describe a similar ancestry. Pedro Barbosa's

1996 title, *A ciberliteratura: Criação literária e computador* (Of Cyberliterature: Literary Creation and Computer), also builds a chronology with reference to some of these automatically generated works, and an entry in *The New Princeton Encyclopedia of Poetry and Poetics,* written by Louis T. Milic, briefly introduces a few titles. These historical sketches—which usually posit artists in the milieu of Max Bense in Stuttgart during the 1950s as the originators of computerized language arts—have most recently been traced in the introduction to *poesis: The Aesthetics of Digital Poetry,* coedited by Block, Christiane Heibach, and Karin Wenz. With the exception of Barbosa's book and Donguy's essay, however, the abovementioned works divulge few, if any, finite details about the digital poems themselves.

The tendency to avoid detailed readings of early works is curious. Beyond the fact that the preceding references are introductory essays, the inclination to sketch only the history rather than a more detailed exposé also likely results from the fact that few documents deliberate about the technical intricacies of digital poems. Critical and analytic tools have not been developed for this recent and developing genre. Nonetheless, I find the editorial viewpoint expressed by the editors of *poesis* troublesome: "The results of these experiments and the actual processes in the machine were actually less significant than the question as to how to interpret automatic text generation with respect to its aesthetic functions, such as relative to the creativity of a human author" (19). Such a view dismisses the reality that poetry, by definition, revolves around verbal components and that what the programs emit should be read and discussed in terms of its finite verbal content. Divulging technological and textual details along with aesthetic results is an important component in my study, as it aids in illustrating what defines a work—and how it can be understood—as poetry. The writings mentioned above are, in any case, touchstone texts that confirm and support my own narrative of digital poetry's early history. I have been able to locate or at least uncover information about most of the works referenced in these writings and have discovered many other works in the process.

Historical Forebears

Dada poets (circa 1915–23) strongly influenced this style of digital poetry. Dadaism's principles of revolt, "disgust," "pullback from the absolute," and process of denaturalization are reflected in many works (Rothenberg and Joris 289). This influence is highlighted by the fact that one of the most ver-

satile computer text-generating programs acknowledges in its title, *MERZ poems* (1992), the touchstone of Dada (and in particular Kurt Schwitters, whose poems made out of "the sounds of coughs and sneezes" and "collages from found objects" are an acknowledged inspiration) (Valentine and Rogers n.p.). In their opening screens authors Rudolph Valentine and Doug Rogers explain that *Merz* is the term Schwitters used to "describe the seemingly random and haphazard manner in which he created art."

One method of Dada poetry, as stated in a subsection of Tristan Tzara's *Dada Manifesto,* "How to Write a Dada Poem," instructs readers to cut up newspaper articles into individual words and make a poem by random selection and reorganization. Dadaists challenged convention with other methods, including collage, the invention of new words (neologism), typographical distortion and desecration, transcription (or use) of nonsemantic sounds, and collaboration. Since all of these elements are found in early digital poems (i.e., the language and other media that serve as the database of the generated digital poem are akin to the clipped words from the newspaper, etc.), Dadaism is unquestionably a historical model that can be used as context for many of the computerized works. Poems shown below reestablish—using computer operations—the radical unconventionality that was emerging and had already been permitted in twentieth-century literature (not only at the Cabaret Voltaire but in futurist exhortations, surrealist cut-ups, and elsewhere). Alteration and permutation of words and short phrases to subvert meaning (in semantic revolt) is certainly one manifestation of cybernetic Dadaism, and some programs propel this aspect of Dadaist impulse into new realms. Instead of scrambling and reforming a single set of words, digital poets use multiple input texts and programmatic techniques to process, reorganize, and re-present texts, as new procedures for manipulating bodies of language become available. While not all text-generating initiatives follow in the Dada lineage, automatically randomizing texts with computer programs is a logical next step in the Dada progression, wherein artists like Jackson Mac Low invented complex systems that not only reapplied Schwitters's radical practice but advanced it into contemporary textual space.

Using entirely different methods, which favored writing under programmatic constraint instead of chance operation, the Oulipo group, founded in France in 1960, advanced various forms of noncomputerized procedural poetry and writing that employed arithmetic. Poems and other forms of writing devised by members of the group meaningfully influence works

discussed in this chapter. *Oulipo,* an acronym for *Ouvroir de littérature potentielle* (Workshop for Potential Literature), as Harry Matthews and Alastair Brotchie explain in the *Oulipo Compendium,* was formed by a group devoted to exploring "the possibilities of incorporating mathematical structures in literary works" (201). The idea that the pursuit was "potential" literature is especially significant; developing a single formula that could lead to the construction of an unlimited number of works was essential to the Oulipian creative process. Writings by the members of the group were subjected to formulaic, restrictive methods, which diverged from the traditional application of metrical elements in the numerical formulas of the sonnet, sestina, haiku, or other forms. The group embraced constraints imposed by numbers to liberate speech and presented a radical, sometimes gamelike, alternative that equally exploited the power of numbers and patterns in the process of making text. One well-known example of Oulipian methodology is the "n + 7" poem, in which the author customarily selects a base text and replaces each noun in the original poem with the seventh noun that falls after it in the dictionary. In effect this work warps, or re-realizes the possibilities within any given statement or set of texts. The most famous work associated with Oulipo is Raymond Queneau's *Cent mille milliards de poèmes* (100,000,000,000,000 Poems), in which each line of a sequence of ten sonnets can be interchanged with the corresponding line of another of the sonnets. This configuration of lines and text enables the reader to manipulate ten pages of text into one hundred billion different poems. To a large degree the group's formulas led to irrational combinations of words and phrases, sometimes pushing language, as O. B. Hardison writes in *Disappearing through the Skylight,* "to the limits of intelligibility" (200).[1] These transformational formulations, which undermine meaning and stability, became major characteristics of text-generating programs later in the decade even though Oulipian works did not involve random composition. In *Digital Poetics* Glazier stresses the importance of Oulipo's relation to digital poetry and poetics: "Oulipian invention provides a rigorous investigation of the program as a generative agent in the literary work, and its methods provide a useful reference point for considering algorithmic generation of poetry" (128).[2]

To a lesser but significant degree (especially because they offer evidence for comparison), computer programs emulate classical styles of poetry, written with strict parameters to engineer sonnets, renga, occasional poems, aphorisms, and other traditional forms. The tenets of composing structured

verse are transposed into the program; thus, some forms of traditional poetry make an impression on the genre from an early stage. Above all other forms, the programming of computer haiku was the most widely explored of this type of practice. Because the haiku seeks to dispatch a lot of imagistic information in a short amount of time and space, it is perfect for computer reformulation. Not only did programmers have to deal with fewer lines and words (only seventeen syllables), but also the form in essence asks for quick, compulsive leaps.

Technological Methods

The means of creating poems with computer languages have changed over time. The earliest works were produced using program-controlled or mainframe computers with integrated circuits that were being developed in the 1930s, 1940s, and 1950s, such as the Zuse Z22 and the IBM 7070. Instruction code, essentially a series of notations, would be entered and transposed onto punched cards that would be fed into another part of the machine and "read" in order to run the program.[3] A number of program languages consisting of alphanumeric data became, using a designation Ted Nelson applies in *Computer Lib/Dream Machines,* the "contrived" (intricate, technical) method of providing instructions or commands to a computer (although a digital calculator—a device invented in 1944—is also used in at least one example) (15). Each programming code allows "loops, tests and branches, and communication with external devices" (15). Languages developed in the 1960s, such as BASIC, TRAC Language, APL, and FORTRAN, were written on terminals and run on compatible mainframe computers controlled by the government, corporations, or universities. Intel RAM chips were invented in 1968, and beginning in the 1970s, word processors that could run BASIC programs became available (though at $3,000 the price was still high); and computers on which programs could be written and run without creating punched cards became commonplace. Development of GUIs and software programs such as HyperCard in the 1980s (which enabled hypertext works and allowed programmers to construct randomly generated works) signaled a major advancement in the availability and possibility for computer poetry. The GUI and mouse, combined with software capabilities, meant that information on the computer could—in many ways—be manipulated and programmed visually, without typing commands. HyperCard could produce significantly different kinds of work,

underscoring the similarities between forms of digital poetry and how textual information can be linked in different ways.

Typology

All works of text generation, or archetypal computer poetry, can be seen as performing some type of permutation in that they transform or reorder one set of base texts or language (word lists, syllables, or preexisting texts) into another form. This process is akin to poets who work with vocabulary and speech patterns; as Glazier writes in *Digital Poetics,* "procedure, in varying forms, has always been part of poetry" (103). In devising a typology of these works, I measure the permutation procedures of algorithmically generated poems into three classifications. Works are either permutational (recombining elements into new words or variations), combinatoric (using limited, preset word lists in controlled or random combinations), or slotted into syntactic templates (also combinatoric but within grammatical frames to create an image of "sense"). "Code poetry," a related pre-WWW concept, is a manual formulation of poetry that adopts the language and aesthetics of coding but is not computer-generated work.[4]

Past critics classified computer poems using schemes that are basic and somewhat useful. As reported in M. Vincent van Mechelen's 1992 essay "Computer Poetry," Dutch writer M. Boot determined three categories in 1984: the "dice model," in which single words are chosen at random from a dictionary; the "sentence variation model," in which grammatical rules are observed; and the "filter model," which is based on "pattern recognition" in a text (3).[5] Subsequently, two literary reference volumes (*The New Princeton Encyclopedia of Poetry and Poetics* and *Longman Dictionary and Handbook of Poetry*) have categorized computer poems as either "formulary" or "derivative" (Milic 1993; van Mechelen 1992).

The above classifications are not impermeable—categorizations of digital poetry are still an open discussion. In poems made through computer programming the matter of category is not necessarily an either/or situation.[6] Certainly, one can see dynamics beyond the digital poem's identity as "derivative" or "formulary." While Boot's framework and the encyclopedic categories could be used effectively in classifying the work, I have decided to form a typology that more specifically identifies clearly perceivable dynamics. Using these types allows me to focus more closely on the work, and through them I am able to introduce the subtleties and complexities more

thoroughly, even if my framework requires drawing from more than one type to explain how a particular work functions.

The chronological presentation of materials in this chapter is complicated by the fact that several authors explore more than a single method of composing elements and practice multiple types of construction. Because my typology is nonbinary, programs (or titles) are seen as reflecting more than one type of programmatic effect. This attribute makes a linear narrative problematic, as does the fact that the divergent (yet related) modes developed simultaneously and have essentially coexisted since the beginning years of digital poetry.

First Digital Poems and Permutation

The pursuit of composing poetry by using computer operations began in 1959, when Theo Lutz made "stochastic" (random variation) poems written on a program-controlled Zuse Z22 computer. At the time, he was a student of Max Bense, who suggested using a random number generator to accidentally determine texts.[7] Examples of this work, which applies tools of mathematics and calculation (i.e., logical structures) to process language, along with descriptions of its attributes, were published in a 1959 article ("Stochastic Texts") in Bense's journal *Augenblick*.[8]

Lutz made a database of sixteen subjects and sixteen titles from Franz Kafka's novel *The Castle*. Lutz's program randomly generated a sequence of numbers, pulled up each of the subjects/titles, and connected them using logical constants (gender, conjunction, etc.) in order to create syntax:

> Not every look is near. No village is late.
> A Castle is free and every farmer is distant.
> Every stranger is distant. A day is late.
> Every house is dark. An eye is deep.
> Not every castle is old. Every day is old.
> Not every guest is furious. A church is narrow.
> No house is open and not every church is quiet.
> Not every eye is furious. No look is new. (Freitag)

In this excerpt from Lutz's work we can see patterns and repetitions of words, along with discursive leaps and quirky, unusual semantic connections (e.g., "No village is late"). The words themselves are not complicated,

but when they are automatically or randomly arranged into syntax via computer program the transaction imposes a nonrational ordering of subjects and thoughts. The text—seen above in translation, a further complication—is readable but disjunctive. Readers must connect and interpret abstractions in the poem (not a new phenomenon in reading or writing poetry) and derive meaning from the verbal associations while reading the text in and against its context. In poems such as this, one might rediscover, via the poet's condensation and computer processing of the materials, the essence of Kafka's story or somehow experience new perspectives derived from the original text. Lutz's selection of words, combined with his programming method, enables a speculative, self-reflexive, unconventional style of expression; the programming method consists of about fifty commands and could theoretically generate more than four million different sentences.

Using the parameters established in my typology, "Stochastic Text" is certainly a combinatoric poem that uses sparse, preset word lists in controlled and random combinations. The language also contains permutation: the same few words are used over and over, each time the program is run. It is not a permutation of the entirety of Kafka's text; it is a variable, fragmented permutation of the words Lutz chose from the story. Many related experiments in computer-randomized poetry have been conducted since 1960, primarily in Europe, the United Kingdom, and the United States. Lutz was at the crest of a wave that viewed mathematics, science, and creativity as cooperative disciplines that could forge new interrelationships through computerized mechanisms. Until the GUI became a more common feature of personal computers, Lutz's approach was the form's status quo—synthesizing source files and written programs used to access and activate the source files, the method of composition of "Stochastic Texts" and subsequent "Autopoems" published in Abraham Moles's *Art et ordinateur* (Art and Computer) (1971) and in Barbosa's *A Ciberliteratura* (1996). In *Computers and Creativity* Carole Spearin McCauley describes three essential stages in the process of creating such works: "determining a frame (single words, lines, or stanzas with particular grammatical features); creating a dictionary of words for use in the frame; and finally, adding any extra qualities or instructions (the machine should choose only certain rhymes or words beginning with a particular letter or should print the results in certain patterns on the page)" (113).

Brion Gysin explored a different yet related idea in his first permutation poem, "I Am That I Am," which is a cyclical, randomized representation of

the three words contained in that phrase. Gysin's permutation poetry imposes a preestablished pattern on the words in a phrase, so they appear in different orders until all possibilities have been exhausted. Thus, a poem made with a three-word phrase will be six lines long ($3 \times 2 \times 1$); a poem that begins with a five-word phrase, such as "I am that I am," will be 120 lines long ($5 \times 4 \times 3 \times 2 \times 1$). The availability of computer technology automated the process of randomizing these permutations. José Férez Kuri's critical anthology *Brion Gysin: Tuning in to the Multimedia Age* shows four examples of computer-generated permutation poems, programmed to appear in block formation by Ian Somerville in 1960 (other versions of the poem are shown in *An Anthology of Concrete Poetry* and Richard Kostelanetz's *Text-Sound Texts*):

I AM THAT I AM
I THAT AM I AM
I AM I THAT AM
I I AM THAT AM
I THAT I AM AM
I I THAT AM AM
I AM THAT AM I
I THAT AM AM I
I AM AM THAT I
I AM AM THAT I
I THAT AM AM I
I AM THAT AM I
I AM I AM THAT
I I AM AM THAT. (93)[9]

In a 1964 piece called "Cut-Ups Self-Explained," also included in *Brion Gysin,* Gysin declares, "The permuted poems set the words spinning off on their own; echoing out as the words of a potent phrase are permuted into an expanding ripple of meanings which they did not seem to be capable of when they were struck and then stuck into that phrase" (154). Gysin held iconoclastic—and what would now be considered postmodern—views regarding poetry and the freedom of language: "The poets are supposedly to liberate the words—not to chain them in phrases. Who told poets they were supposed to think? Poets are meant to sing and to make words sing. Poets have no words 'of their very own.' Writers don't own their words" (154).

Gysin's creations mirror the method of a "proteus" poem and can also be seen as an adaptation or transformation of the traditional renga poem. Instead of keeping an entire line intact, however, the poet creates a poem from one line, in which the words are internally cycled in a random pattern. In Gysin's work the process is repeated over and over until every word has appeared in every possible position in the line of the poem.[10]

Strict permutation with added elements is found in Barbosa's "Porto" (written in 1977 and included on *Syntext*), in which every activation of the program produced twenty-five lines of text that present permutations of a text built from four subjects: "PEDRA" (stone), "SAUDADE" (longing/nostalgia), "HISTORIA" (history), and "GRANITO" (granite).[11] The additional inclusion of prepositions (e.g., *NA/NO, A, DA/DO, O* in Portuguese) assigns alternative content to the nouns, enabling grammatical variation into the output. Porto, a city built on steep granite cliffs on the coast of Portugal, is the inspiration for the language presented and rearranged by the author for poetic effect. The output appears as a block of text of capitalized letters, and as such it has a strong visual quality. Barbosa's program, while certainly cyclical, performs an expansion of the smaller permutations created by Gysin. Mathematically, four words in themselves can only be ordered twenty-four different ways; Barbosa's program here enables 40,320 permutations. Since a limited amount of text is recycled, repetition of phrases would otherwise begin to occur quickly. The addition of prepositions adds three times as many configurations and prevents the poem from reflecting a slot apparatus. In the first ten lines of the following sample translation of "Porto" the order in which lines appear is not repetitive, although their construction is formulaic.

in the nostalgia of the stone the granite of history
in the nostalgia of the stone the history of the granite
in the nostalgia of the granite the stone of history
in the stone the nostalgia of the history of granite
in the stone of the granite the history of nostalgia
in the stone the history of the nostalgia of granite
the nostalgia of the granite the history of the stone
in the granite of the stone the nostalgia of history
in the granite of the stone the history of nostalgia
in the stone of nostalgia the granite of history.

Even though the second and sixth lines are identical, with the exception of one permutation, and others shift two pairs of words, the overall effect that is achieved by Barbosa's program is that endless different phrases are built that transmit different dimensions of the same sentiment. In each of these lines a sense of the passage of time, as absorbed by and reflected in the rock formation that supports the city (Porto), is apparent. By extension, other cultural aspects of the city and its people may be read into the lines, some of which nearly defy interpretation.[12]

These first examples contain simple permutation. Repetition—a strong indicator of some sort of permutation—is a blatant (and sometimes negative) attribute of these early works. Gradually, the permutation became more complex as the poems began incorporating other texts and more source materials. This trait diminished over time, or was made unrecognizable, by the blending of multiple texts, use of larger databases, and increased computing capabilities (more memory, better storage devices, etc.). Multiple sources (inputs) led to more possible and diversified combinations, which led to more complexities (for both author and viewer), as well as more outcomes. This form's original conditions did not drastically change, however, until new programs and approaches took hold in the 1980s.

As described in my introduction, Balestrini's "Tape Mark" poems (1961) recombine passages (in Italian) from three different writers. The program combines and constructs chains of words from these passages, ultimately and unavoidably portraying a scenario of nuclear disaster as a result of the inclusion of Hachiya's text.[13] At Cybernetic Serendipity the program repurposes sections of these texts to generate six-line poems with four metrical units per line, which are later edited for grammar and punctuation.[14] Each of the "Tape Mark I" poems has a different syntactical structure, even though the same words are often present from poem to poem. A passage from the exhibition catalog, translated by Edwin Morgan, highlights its qualities of permutation:

> Hair between lips, they all return
> to their roots, in the blinding fireball
> I envision their return, until he moves his fingers
> slowly, and although things flourish
> takes on the well known mushroom shape endeavoring
> to grasp while the multitude of things comes into being.

In the blinding fireball I envisage
their return when it reaches the stratosphere while the multitude
of things comes into being, head pressed
on shoulder, thirty times brighter than the sun
they all return to their roots, hair
between lips takes on the well known mushroom shape. (55)[15]

The use of set phrases in these poems ("hair between lips" or "well known mushroom shape") gives a rengalike quality when more than one is presented at a time.[16] The positions of the poem's phrases and the meaning they produce change in each example. Though the shapes of each stanza are similar, Balestrini's programming method can generate a variety of poems (within finite parameters) from words composed for other purposes; the program, like Lutz's, devours multiple texts in order to produce combinatoric, permutation poems. The brief phrases in Balestrini's dictionary collect and intricately reconfigure excerpts from previously written texts to generate hybridized, contemplative, and haunting expression.

Combinatoric Poems

Combinatoric poems show varying degrees of versatility in the documentation of 1960s works. Repetition diminished as the style developed. Combinatoric techniques often produce free verse, but they were also applied to construct verse forms.

Open Verse Works

A November 1962 issue of *Time* magazine brought one of the first examples of computerized combinatoric poetry to a large audience. It featured a brief notice in the books section titled "The Pocketa, Pocketa School," introducing "Auto-Beatnik" as a computer programmed to create poetry.[17] This unattributed exposé prints and informally discusses two examples of "Auto-Beatnik" poems and offers a serious interpretation of one of them. The poems published in *Time* contain syntax and are thematic as a result of Auto-Beatnik's narrowed vocabulary (3,500 words/128 simple sentence patterns):

Few fingers go like narrow laughs.
An ear won't keep few fishes,

Who is that rose in that blind house?
And all slim, gracious blind planes are
coming,
They cry badly along a rose,
To leap is stuffy, to crawl was tender. (99)

One can see unconventional connections and phrases but none beyond the boundaries of poetic license. Action, description, question, projection, and judgment—all poetic traits—are present. The second excerpt is similar to the first only in that it uses a simile in the first line and contains unusual inflections:

All girls sob like slow snows.
Near a conch, that girl won't weep.
Stumble, moan, go, this girl might sail
on the desk.
This girl is dumb and soft.(99)

Most interesting, the program can emulate free verse and aesthetically resembles a strain of "Beatnik" poetry (though here I am not referring to sophisticated and utterly profound works such as Allen Ginsberg's "Howl"). The first line certainly echoes the style or tenor of Jack Kerouac's poetry, especially in recognizing the suffering of all organisms (Kerouac was known for his use of Buddhist themes). A girl close to nature "won't weep" but the one with the desk is "dumb and soft" (99). The poem raises poetic questions: Is this a critique of culture? From one perspective it reads as a masculinist put-down, from another as subjective information from which perhaps something else may be deduced. In this Auto-Beatnik poem the program does not reveal sensitivity but does reflect the stream-of-consciousness qualities of many Beat works.

In the late 1960s, technological experiments in combinatoric poetry flourished as others began to explore digitally programming texts. Jackson Mac Low, already a prominent poet based in New York City, created his first computer poems while he was a resident at the Los Angeles County Museum in the summer of 1969, using a PFR-3 programmable film reader that was designed for graphics applications connected to a DEC PDP-9 computer.[18] The program Mac Low worked with, he explains in *Representative Works: 1938–1985,* selected and permuted words from a list of short messages he

had composed, or randomly ordered lines of messages. Further permutations also occurred in printing the output text, as only every tenth line was printed. The program's database (the "message lists") and processes allowed Mac Low to create "an indeterminate poem, of which each run of the printout is one of an indeterminable number of possible realization" (209). "Printout from 'The'" used a message list containing "about 50 messages"; the following excerpt is indicative of the poem's style:

THE WIND BLOWS.
THE RAIN FALLS.
THE SNOW FALLS.
THE STREAMS FLOW.
THE RIVERS FLOW.
THE OCEANS RISE.
THE OCEANS FALL.

THE BUSHES GROW.
THE MOSSES GROW.
THE FERNS GROW.
THE LICHENS GROW.

THE TREES SWAY IN THE WIND.
THE FLOWERS SWAY IN THE WIND.

THE INSECTS ARE HATCHED.
THE REPTILES ARE HATCHED.
THE MAMMALS ARE BORN.
THE BIRDS ARE HATCHED.
THE FISHES ARE HATCHED.

THE PEOPLE SAIL ON RAFTS.
. . . . . .

THE INSECTS GATHER FOOD.
THE BIRDS GATHER FOOD.

THE PLANETS SHINE.
THE MOON SHINES.
THE SUN SHINES.

THE TREES DRINK. THE FUNGUSES DRINK.

THE MOSSES TURN TOWARD THE LIGHT.
THE FLOWERS TURN TOWARD THE LIGHT.
THE TREES TURN TOWARD THE LIGHT. (214–15)

Clearly, the programming leads to extensive repetition. Mac Low's mediation of the materials, however, contains compelling variation (by virtue of the way its message lists, or output, subtly permute and combine the poet's lists). Although it may not be cubist per se, the program, in effect, functions in the manner of a modernist writer such as Gertrude Stein, featuring poetic distinction and familiar belletristic traits. Repeated themes and phrases are organized so that the segments of language work together. Since the elements in the database are coherent, referencing nature and its processes, some semblance of sense and meaning—as well as an epiphanic push at the end (the fortunate turning toward the light)—substantiate this effort as a literary work.[19]

Among other artistic pursuits, Alan Sondheim created several inventive conceptual works in the 1970s, including poems he produced by programming a calculator to perform language generation.[20] Though it would be difficult and unfair to summarize the dense theoretical foundations for his efforts, in part explained in the author's essay "W (world-particle)" (1979), Sondheim's calculator poems grew out of an attempt, he writes, "to bracket and develop an ontology of the life-world" (11). The poems varied between using words and dots as modes of expression, exploring phenomenology, materiality, and abstraction within a formally stochastic setting. The example shown below, produced using a TI59 calculator (attached to a PC100A printer), illustrates Sondheim's interest in the presence and absence of both nonsense and intention (concepts he discusses at length in "W").[21] This excerpt is a sample of a "concatenation grammar based on an aftereffect of 3–4 units maximum":

OR
TO
A
CHILD
RAN
TO
A

LOVER
HE
WALKS
TO
A
CHILD
TROLL
SLEPT
WITH
JOAN
HATED
ANNE
SLEPT
WITH
TROLL
BEAST
WALKS
TO
A
LOVER
OR
TO
A
LOVER
WELL,
THEY
HAD
THE
PARTY (15)

The examples of the "TI59" poems shown in *Criss-Cross Art Communications* (1979) draw words from lists in various ways, resembling minimalist poems in which truncated narratives emerge. Another type of poem, the "Combination Hierarchical-Systemic and Concatenation Grammar," is especially abbreviated, uses punctuation as some type of notation, and is more nonsensical, even though a series of characters and actions can be determined and followed despite the fragmentation. The calculator's single kilobyte of memory limited the character output to five letters. Sondheim

works within these extreme confines to construct a type of poetic shorthand, using language that could (but did not always) propel the portrayal of a sequence of events. As with other stochastic texts, these selections feature a significant amount of repetition—the repetition of verbs has an echoic, if not lyrical, effect. In a 2003 interview Sondheim reported that such work was easy to do but that he was quickly bored by it, and few other examples of his calculator works are available. Once the novelty of using a mathematical tool for processing language into poetry wore off and its limitations were observed, Sondheim began to experiment with other methods of procedural digital writing that enabled expanded forms of expression.

Sondheim's next computer-generated texts were created with the "Iceland Program," written in Pascal programming language on a TERAK minicomputer and DECWRITER III printer. These experiments are chronicled in a book titled *Texts,* published by the University of California, Irvine, in 1979. The author's note explains that the work was concerned with the question of "whether or not 'meaning' can be embedded in such a primitive program," which "represents some of the features of English syntax as well as the 'semantics' of the chronicle style" (n.p.). The program begins composing with an internal number generator that identifies a "seed for pseudo-random incrementation" used to generate a text; the processing occurs in the "formation (concatenation) of strings" created as the program progresses. Summarizing the program's work, Sondheim writes: "The vertical program hierarchy proceeds from letter/suffix to word to type to phrase to clause or sentence to response to text, under seed control. The text changes lexicon and semantics as it proceeds; this creates an imitation of history" (n.p.). Two different factors contribute to the formation of work, and thus the program outputs altogether different styles of work and constantly redirects its own information. A simple language-generation program worked hierarchically in tandem with a program that modified human input, making the computer an independent filter. In addition to these lexical and semantic changes, cyclical elements—such as the figures from history that are literally used by Sondheim in *Texts* to reflect his idea—also persist and accumulate in the work, as seen in this excerpt from the beginning of "File: Store.txt":

Then Rosa argued:
"Pol Pot the right Hegelian fought Rosa!
and Hegel was convinced!!"

i.e., of the error of his ways!
Marcuse said: "
Pol Pot the left Hegelian disavowed Hegel. . . . .."
He did imprison in 1905 beneath the Bourgeoisie.
Lefebvre the correct killed Stalin
Thus Stalin would have been killed by Lefebvre the correct since
Stalin fought Stalin.
So argued Mao!
Adorno the heated argued on the international that had been
deserted.
Ho had been a woman of the people!
They were the one who fought Mao!
Lefebvre the fascist killed Hegel
Hegel died of wrongdoings on a headquarters.
Thus Hegel was killed by Lefebvre the fascist but
Horkeimer [*sic*] required Hegel. (n.p.)

Each of the narrative's iconic figures partakes in an imaginary dialogue that, in this case, is humorous and ridiculous, a condition that unquestionably results from its digital (i.e., programmatic) foundations. The work is infused with illogical grammatical connections and historical representations (e.g., "Ho had been a woman of the people" or "Lefebvre the correct killed Stalin") that ordinary authorial cognition would discard as erroneous. To the computer program, however, gender is unspecific unless the programmer establishes qualifications; a name is a noun that is distinguished by its spelling, not by personal achievement or identity. Throughout his work Sondheim implies what he described in "W" as "a refusal of appropriation" (13). Here he establishes dialectical value by using business- and science-related machinery to form expression yet rejects any sort of commonplace application or mode of operation. He appropriates names of several profound philosophers, yet the program extracts them from historical context and blends them into an essentially indecipherable fiction. The randomization of elements illustrates truths of progression (or perhaps false progression), imperfection, erasure, and the possibility of artistic autonomy (in that an expression can function in its own right as a unique object that is not intended to be part of a larger organism). As he writes in a statement included in *Texts,* "File: System.Wrk.Text," "There is no Iceland 'world' "

(n.p.). Thus, Sondheim uses programming or networked poems in contradistinction to the typical purposes of the medium itself.

In another work Iceland generates a completely different type of poem. A single phrase is introduced and permuted as other phrases, and sentiments are briefly introduced and processed. Here is the poem in full:

Hysterical activity, art, hernow and then
Hystercal activity, art, hernow and then
Hysterical actvity, art, hernow and then
Hysterical activity, art, hernow and athen
Hysterical activity, art, hernow and an
You might findnow and then
You msheight findnow and then
You mshesheight findnow and then
You mshesheshesheight findnow and then
You mshesheshesheight findnow and then
Ors against her smooth body
Ors againssmooth body
Againssmooth body
Ainssmooth body
Ssmooth body
Ooth body
H body
Ody

A chance encountera touching reminder
A chance encounouching reminder. (19)

In this example the poem verbally and visually diminishes as the program produces output, before expanding again at the end. Both the verbal language and the application of programming language are used unconventionally, indicating that techniques and methods of communication are flexible. This style of creative expression, while retaining verbal qualities that provide a general context for the work, manages to draw other enlivened elements through recombination and processing. The four distinct shifts in this short piece reflect the stages of thought someone might encounter in an unfamiliar situation, particularly a chance encounter of a sen-

sual nature. Unusual verbal manipulations in Sondheim's program serve to emulate confusion, excitement, and rapture, reflecting a psychic state in which mind and thought become disconnected (perhaps even dysfunctional). Lines produced by the program clearly illustrate some primary dynamics of electronic text: neologism/nonsense, permutation, and repetition (with variation).

Angel Carmona's "V2 Poems" is a DOS program from the 1970s that is still accessible via Barbosa and Cavalheiro's *Syntext*.[22] When activated, the program rapidly generates a series of lines on the screen that must be manually paused to be read. The output appears as grammatical sentences, combining mainly traditional language with some neologisms so that the phrases resist bearing finite meaning. A sample of nine lines recently generated by the program sustains coherent narrative expression. The sequence contains unusual associations and discursive overtones, punctuated with exclamatory and interrogative statements:

Oh, how I do remember the quiet gardens forever feared!

The sparks weep . . . in silence the rocks wake up again and burst slowly with a lot of space crying in smells never imagined.

Why do I remember the silent moment of reflection?

World of the night do not kill the flight . . .

How much do I long for the quiet deserts, from now on with me!

Will speak dark and absorbed my arms because the day of no fear would have begun.

The cliffs explode again . . . for ever the valleys overflow and burst again slowly with a lot of space until they are in spontaneous spaces.

Hit magic and dark my screams fondling in impossible steps of all the Advises because it would have sound the night of no shutting up.

The rocks crack . . . with a scream the suns return and hide slowly
with a lot of space until engaging in spontaneous sounds.

Although the passage is certainly a fragment, the opening line's "quiet gardens forever feared," draws the reader into a speculative internal dialogue that is sustained by characteristics of the programming in the lines that follow. The effects of the poem are heightened by sophisticated, surprising images ("crying in smells never imagined") and by fusing words to create new words, as with "despaciadamente," in the second and later sections, from which the phrase "slowly with a lot of space" is derived (*despaciadamente* is not a word but its roots are: *despacio* = slowly; *espaciadamente* = with a lot of space). The lines continue to approximate a reflective narrative of torment and realization with poetic lilt (e.g., "world of the night do not kill the flight") and dramatic sense, as in the juxtaposition presented in the fifth and sixth sections, "How much do I long the quiet deserts, from now on with me! / Will speak dark and absorbed my arms because the day of no fear would have begun." Reading the combination of lines and awkward syntax in this example requires work, as do many sophisticated poems, and any cumulative meaning or understanding is established by the reader, who is challenged to create the circumstance given the framework and loosely directed verbal scheme. At the end of the passage above, the invented language (such as *despaciadamente*) leaves room for speculation. This poem literally displays a momentary reflective pause in a litany of text created by Carmona's program, which does not apparently conform to preconfigured structures and thus appears as a more versatile variety of randomized work.[23]

Other European and British works, following in Balestrini's mode, directly permute one poem to create an endless series of new poems. The programming serves to reassemble a given text, or what Barbosa and others refer to as the "text-matrix" (e.g., Barbosa's "Cityman Story," Robin Shirley's "Cosmic Poems"). In this process one poem becomes the foundation of, as Jean-Pierre Balpe describes in his essay "E-Poetry: Time and Language Changes," an "infinite, not eternal" chain of subsequently produced works (7). Barbosa's "Cityman Story" (1980), included with the *Syntext* program, is an example of this variational style. Described as a "synthesizer of narratives" on its title page, the program is written to recycle the language of a "text-matrix," which is an unspectacular fourteen-line poem that lists occurrences of a mundane life in confessional form:

Here is a 35 year old man
Every morning he takes a bus
Gets in the office
catalogues index cards
lunches in the city
recatalogues index cards
drinks two beers
Returns home
kisses his wife
says hello to the children
eats a steak with the television in the background
lies down
fornicates
falls asleep.

"Cityman Story" produces a series of texts that portray surrealistic (absurd) and humorous characteristics, in which "there are progressive degrees of freedom" (n.p.). Each version of output is formed with the same phrase ("Here is a . . ."); however, the "voice" of the poem also takes on alternative identities, such as the city or the bus, as seen in these fragments of generated text excerpted from the beginning of two different activations:

Here is a bus of 35 index cards
Every morning he takes a man
Gets in the office
classifies two wives
. . . . . .

Here is a city of 35 wives
Every morning takes a bus
Says hello to the television
Gets in the background. (March 23, 2005)

The program does not elevate the status of the initial poem but does, in its transformation of the base text, retain a type of narrative while transforming the language into something different, projecting a narrative by something or someone who is seeing the world from an alternative point of view. In another example, the man in the poem is "of 35 beers" (July 12, 2004);

a type of drunken rambling ensues—and is projected by the program in general—as if the man is confused and disoriented by this state of being, and life has led to delusion:

Here is a 35 beer man
Every morning he takes a bus
Gets in the index cards
classifies the years
lunches the office
reclassifies the years
drinks two wives
Gets back home
kisses a steak
says hello to the television
eats the children with his wife in the background
Lays [*sic*] down
Doesn't fornicate
Doesn't asleep [*sic*]. (March 23, 2005)

The first two lines in each of the poems begin with the same patterns, but the subsequent verbal structures are not uniform. Completely alternative perspectives and meanings, divergent from the original poem, emerge through the randomness of the subsequent lines' order and shape. Shirley, Christophe Petchanatz (*Alire* 6), and others produced programs to use a style of "cut-up" technique, drawing words and phrases from a single "text-matrix" to create new poems.[24]

Gradually, the number of matrices embedded in programs began to multiply, and some programs began to enable users to contribute input.[25] Petchanatz's "Prolix" (version 1.07, 1992), though essentially a string of sentences, takes shape as a poem that contains two separate but associated active components, "Prepare" and "Prolix." "Prepare" enables the viewer to create her or his own files to add to "Prolix" (documents created with "Prepare" are given a ".p_p" file extension). Operating "Prolix," the viewer is advised to select two files with a ".p_p" file extension, which the program then blends into a new text. The hybridized poem scrolls down a blue background screen; words appear a few lines at a time, in alternating yellow and white, depending on their source file. Clicking on the screen halts the flow of text and returns the viewer to the list of files so that the process may begin again. The viewer significantly contributes to generating the documents; the

number of combinations increases as he or she selects files and adds them to the mix using "Prepare." Error messages appear if the program is not operated correctly, including one that says that the texts will be deceiving (an ironic way to describe the effects of a program that is already creating disjunctive documents). The viewer is encouraged to tinker with the "Prolix" and can use it to make customized, automated "cut-up" writings. The chance automation of text makes for awkward results; they become an auxiliary deconstruction of the deconstructed text. Unlike traditional cut-up texts (text generators aside), these are realized blindly and presume that the reader is willing to take the position of the author. As the form grew, poets embraced and expanded the complexity of multimatrix, automatically cut-up (or permuted) poems, and added further parameters to the process (see Cage, below).

Examples and discussion of combinatoric or matrix works that feature an open verse structure in the prehistoric era can also be found in *Cybernetic Serendipity* (Jean Baudot's "Automatic Sentence Generation," E. Medoza's, "Computer Texts or High-Entropy Essays"), *Computer Poems* (Marie Borroff, Louis T. Milic),[26] in rjs's booklet titled *Energy Crisis Poems,*[27] in Hartman's Poetry Composer,[28] Thomas Easton's "Thunder Thought,"[29] Rosemary West's "Poetry Generator,"[30] and other works.

Verse Forms

From the very early stages of computer-generated poetry, programmers used classical forms as models in their experimentation. Though not as common as efforts to create free verse, several programs were written to codify the mechanics of established poetic forms. In order to effectively impose structure, which sometimes includes specific metrical or syllabic parameters, some programmers cultivated syntactical templates to help organize content and "slot" words into rigid patterns. Just as poets such as Ted Berrigan loosely interpret the definition of *sonnet,* however, few computer poems of this sort adhere rigidly to the tenets of classical structures (even if they do so nominally). The process of automating classical forms in itself would not be extremely difficult, but to write a program that shows versatility in output (one that does not essentially write the same type of poem over and over, as do the slotted works) requires flexible interpretation of form.

Jean-Pierre Balpe recreated classical forms in several projects. In 1985 he

wrote publicly presented programs that generate renga and haiku (see note 16). Since the 1990s Balpe has produced a series of programs that have become increasingly more complicated and advanced, to which he has applied the general title Generation.[31] One of the earlier pieces in the Generations series, "The Temptations of Tantalus" (1994), which is included on *The International Anthology of Digital Poetry,* uses HyperCard to generate sonnets, and other programs have generated epigrams and proverbs. In "The Temptations of Tantalus," contents of the output, which appear on the right of the viewer's screen, depend on which section of a narrative prepared by Balpe (containing excerpts of poetry or poetic texts) the viewer is reading on the left.[32] The sonnets appear line by line when the viewer clicks at the bottom of the screen, and although they neither rhyme nor scan as iambic pentameter, each contains a designation for structure and rhythm. A sample of a sonnet—translated into English—reads as follows:

hurt those arms twist his fingers don't consider his knees
look for desire ripe tear furies desires
in his cupidity that torture the burn in the dementia of a rude thirst
insatiable unique moment of such a cowardly weight

where always being tortured self but to the heaviness towards this
markers for temple
unreachable of one heaviness towards what it justify all delirium
absurd thirst very rough toward desire absurdly secret
that destroy or twists or bites or destroy the fate

where desiring so unique inextinguishable morning of a voracity
that this marking like horizon towards every morning and all
delirium
painful that hurts this scared desires like a soul or a body

where desire so unique inextinguishable morning of a voracity
that destroys the envies like a fate where suffering extends
time unique of a thirst so avid towards this evil
Monday, July 5, 2004 : 11:07:56 AM. Structure : 1, rythme : 4

Narrative within the poem moves at a rapid pace; I am sure some would find it *too* fast. Many objects appear, and action is constant. This translation

shows some repetition and awkward syntactic and verbal rough spots but also sustains thematic ties. Subsequent generated texts share some language, but the program generally emits poems of many different styles. In all, "The Temptations of Tantalus" contains twelve different "structures" and eight different rhythmic patterns. Despite his effort to impose form on the poem, Balpe often describes his work as "chaotic" literature, which could be interpreted as a statement on the form of digital poetry in general, which, as his work indicates, is neither necessarily one type of text—or approach to composition—or another.

Of all verse forms that poets have attempted to program, haiku has dominated, probably because of its formulaic limitations. Hartman connects the popularity of haiku generators to the motivations of imagist poetry. In *Virtual Muse* he writes, "As both poets and programmers have realized, for different reasons, the reader's mind works most actively on sparse materials" (31). Haiku's restricted sensibility of the formulaic obviously appealed to many authors, and its brevity made the unwieldy task of programming unique poems more manageable. The form's units of line (usually three) and metrical patterning (five syllables in the first line, seven in the second, and five again in the third) are literally and conceptually inscribed by various programs.

Margaret Masterman and Robin McKinnon Wood developed a "slot" structure to generate orderly haiku at Cybernetic Serendipity (1968; fig. 1.1).[33] "Computerized Japanese haiku" were written in TRAC and feature nine slots that are filled with words from nine different databases. The slots enable grammar to be preprogrammed and, by setting up a thematic association between one another, establish a poem's semantic center (slot 5, fig. 1.1). Slot 1 relates to slots 4 and 5, slot 2 relates to slots 5 and 6, and so on (see arrows on the lower part of fig. 1.1).

Cybernetic Serendipity features several poems created by this program, from which these examples are selected:

1 Poem
eons deep in the ice
I paint all time in a whorl
bang the sludge has cracked
. . . . . .
3 Poem
all green in the leaves

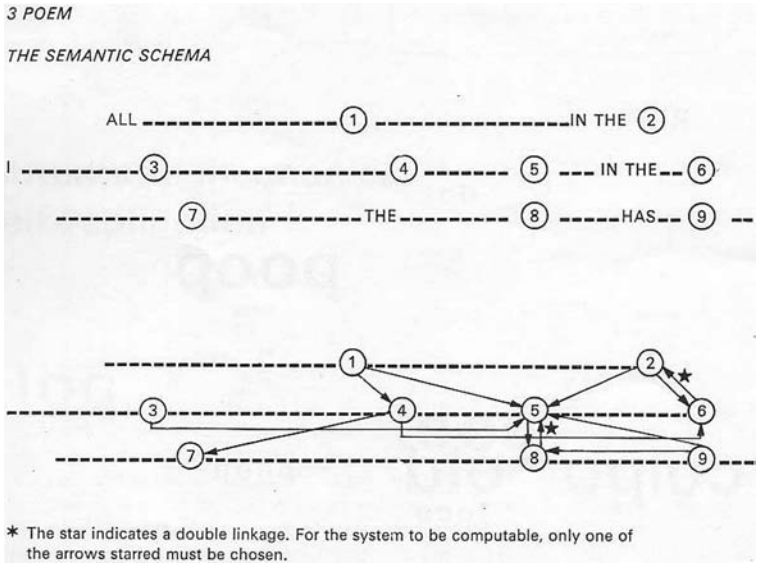

Fig. 1.1. Margaret Masterman and Robin McKinnon Wood. Illustration for "Computerized Japanese Haiku," in Reichardt, *Cybernetic Serendipity: The Computer and the Arts* (London: Studio International, 1968), 54.

I smell dark pools in the trees
crash the moon has fled. (54)

The poems reveal how generated works can be monochromatic in structure when syntax is unvarying and predetermined. The program produces syntactically and mathematically correct poems that effectively follow the haiku format, but it repeatedly creates the same type of short poem. Words selected by the database are the only variable in the formula—in *Virtual Muse* Hartman described this approach to composition of computer poems as similar to the principle "used by Steve Allen in the old 'Mad Libs' game" (31). On the other hand, the computer program clearly and capably creates haiku (although without the nuance one finds in work by masters such as Bashō, Issa, or Santoka); while there is some variation in syllabic content, each example approximates haiku (if not completely reflecting its classical attributes, as "3 Poem" does).

Computer Poetry includes work from three poets. Margaret Chisman's work varies slightly from piece to piece and from the traditional five-seven-

five syllable pattern. The surprise, or spark, typical of refined haiku can be found in the third line, which more than doubles the length of a typical haiku. Her poems are conventional until the last line, which succeeds dramatically by extending the parameters of the traditional form:

The world hates irrevocably
But I discover in the struggle
Free wanton aversion knowing intuitively. (5)

All of Chisman's haiku employ the "slot" system. She programs the lines in identical patterns, without punctuation ("The world" + verb + adverb; "But I" + verb + "in the" + noun; adjective + adjective + noun + verb + adverb). In what is otherwise a consistent presentation of text, the longer, more spacious, third line expands the haiku. The language itself is active, though the adverbial endings are monotonous. As a litany, however, the verbal scheme has a musical effect. The unconventional characteristics built into Chisman's template do at least momentarily liven up the poem, but this is mainly a factor of the third line's doubled length. By slightly altering the form, the poet transforms the scenario presented by the first two lines and brings the reader to a new place.

Robert Gaskins's "HAIKU ARE LIKE TROLLIES (There'll Be Another One Along in a Moment)" and John Morris's "Haiku—At Random," also published in *Computer Poems,* very closely embody the structure of traditional haiku with some variation in their presentation.

Gaskins:

Wandering in mist
Reaching out to soft sunlight
Blue-scaled dragons pause.

Moon low over sea
Glimpse of discarded cocoon
Small fish swimming idly. (16)

Morris:

Frogling, listen, waters
Insatiable, listen,
The still, scarecrow dusk. (44)

Listen: I dreamed, was slain.
Up, battles! Echo these dusk
Battles! Glittering . . .

Fleas spring far, scarecrow,
Oh scarecrow, scarecrow: well, far,
Scarecrow, oh scarecrow. (45)

Both authors use databases that obviously incorporate language associated with haiku along with names of colors, animals (real or fictional), and other naturalistic themes. These elements effectively transmit a mystique and paint a verbal picture for the reader (as is customary of the form). Morris, who was a considerate researcher, achieves diversity particularly in expression and variation of the form.[34] The first example is similar to traditional haiku, but the second is much more open in form despite its syllabic obedience. This is due, in part, to the exclamatory and other punctuation, but it is also the result of unexpected and discursive bridges in the narration. In this example, for instance, one does not normally associate being slain, or battles, with glittering, except perhaps in a dream, which happens to be the setting of the poem. This is profound—no other examples I have seen are set in such a way. The third example is even more unusual for a haiku, as *scarecrow* is repeated five times; other words make up less than half the poem. The differences between the second and third examples are startling. A reader might not detect that the same poet, or poet-programmer, wrote them. Certain words occasionally repeat, but the poems show no sign of being cut from a template. In fact they are, but the template itself is programmed to shift craftily, much to the benefit of the poems, especially when presented in a series; Morris has selected short, common words that fit well into the nature-oriented haiku framework. Later haiku projects, like those of Tim Hartnell[35] and Andrew Stone,[36] share the aesthetic approaches initiated by Gaskins and Morris. These artists feature excellent textual variation that curbs the program's inclination to redundancy. While certain phrases may become familiar to the viewer who generates a few sample haiku, the mixing of context and structures is diverse enough to sustain his or her attention. Programs that deliver a range of interesting output make it worth the viewer's effort to produce and consume poems. Haiku generators (and perhaps text generators in general), are not the type of reading material that one would turn to regularly. Anyone looking for a range of unique derivations of the form will enjoy these programs, however,

and could use the output as a starting point for their own expressive articulations.

Slotted Works

As seen in the discussion above, one can impose outside (artificial) order and formal structure in computer poems by designing a framework where only certain components are randomly filled by grammatically appropriate words. Assembling texts using different varieties of a slotted framework was pervasive in the prehistoric era of digital poetry. In this type of work several layers of randomization may be involved. The author creates slots, and the program randomly chooses words from a database (or "pool" or "deck," etc.). In some examples the sequencing of several different potential styles of output are also randomized, so texts produced under the same title do not contain the same verbal patterns every time a program is activated. The slotted structure makes it easier for grammatical meaning to remain intact, as long as the correct types of word forms are inserted into the pool from which output text is selected.

"A House of Dust" (1968), written by Alison Knowles and James Tenney, is among the first poems featuring collocation via a programmed slot-system and appears in several publications (each time with a different title).[37] The poet-programmers in each instance establish four categories (materials, situations, lighting, and inhabitants) that determine the content of each line within a stanza. "Random meetings" of one element from each of the four categories generate a serial poem, as seen in this example from *Cybernetic Serendipity:*

A HOUSE OF STEEL
    IN A COLD, WINDY CLIMATE
        USING ELECTRICITY
            INHABITED BY NEGROES WEARING ALL COLORS
A HOUSE OF SAND
    IN SOUTHERN FRANCE
        USING ELECTRICITY
            INHABITED BY VEGETARIANS
A HOUSE OF PLASTIC
    IN A PLACE WITH BOTH HEAVY RAIN AND BRIGHT SUN

USING CANDLES
INHABITED BY COLLECTORS OF ALL TYPES. (16)

Hundreds of "houses" can be created if all of the possibilities of this program are exhausted. The cumulative effect of the disparities in each of the poems, with their lightly absurdist expressions, begins to create a mental architecture for readers, though the output syntax is fixed and this work is repetitive. The words or phrases that fill the slots in the second and fourth lines show notable versatility. In the second line, which serves to establish a location, instead of getting a simple word each time, the program can insert in one instance, "a cold, windy climate," then in the next "southern France," and then "a place with both heavy rain and bright sun." Or it can repeat the same line in the same slot for several poems in a row. Such flexibility or variation spares the cumulative poem from being monotonous and redundant, even though it is cyclical.

More than twice as much text appears in the samples of the poem included in *Fantastic Architecture* and *Computers for the Arts* than in *Cybernetic Serendipity*.[38] One can discern only slight differences in the individual iterations of the project—which is not surprising given that they are written by the same program—though later versions include expanded, elaborate fourth lines in some stanzas. Instead of brief lines like "Inhabited by collectors of all types" or "Inhabited by vegetarians," the fourth line in the first stanza of "Proposition No. 2 for Emmett Williams" (in *Computers for the Arts*) reads: "Inhabited by all races of men represented wearing predominantly red clothing" (15). The expansion of text in the last sentence occurs somewhere between the 1968 and 1971 publications. Otherwise, the central structures and language of the poem are similar. Incidentally, the notes for the poem in *Cybernetic Serendipity* claim that one of the houses would be built in New York City a year later, and an online biography that appears on the Left Hand Books WWW site reports that Knowles's "computer instigated dwelling *The House of Dust* is located in California as a permanent installation." The database for the work is thoughtful and effective. These poems invoke the imagination, as the reader constructs the various houses or the one house, shifting in forms with subtle variations. Selecting one of the houses from the poem and constructing a piece of art (or an entire architectural structure) based on it is a palpable—and as far as I know, unique—idea.

Syntext includes "Aphorismes," a clear yet varied slot-oriented piece by

Marcel Bénabou, a member of the Oulipo. This generator, written with the program APL, produces twenty-five aphorisms at a time in French.[39] A sample activation of the program, from which the following examples are drawn, indicates that a number of different equations or slotted configurations are used to formulate statements that often reflect profound human insight. The author has chosen structures such as "X is in Y, not Z," "A delivers B but C will deliver us from D," "Q is the continuation of R by other means," as well as other slotted patterns to communicate messages:

9
Beauty is the continuation of patience by other means.
10
Hatred of ignorance is no other than the love of the rhythm.
11
Science delivers evil, but what will deliver us from the present?
12
Happiness is in horror, not in hatred.

The programming reflects tendencies that have existed since the outset of text generation, though the output, because of the aptitude and choices of the programmer, also reflects a more complex effort in programming than found in many works. Beyond formulating the equations, the author must select appropriate materials to fill the slots. In a case such as "9" above, the closely connected variables call for setting up a range of language that will juxtapose effectively; the same principle is true, but less direct, in equations with more variables. The phrases are clear, grammatical aphorisms made with poetic language. The precise formulation of the sentences and permutations is reminiscent of works presented by the Oulipo group. Bénabou's construction uses a finite amount of programming code to write endless aphorisms. The program is useful, as its assertions are compelling and strong enough to provoke the viewer to think.[40] Other slot-oriented programs include Your Personal Poet[41] and titles by Barbosa, Chisman, Borroff, and Balpe.[42]

Alternative Permutation Processes

The use of combinatoric, permutational, and mathematical processes to produce works that resisted the application of historical convention became

a larger trend by the 1980s, as artists were inspired by Oulipo, Abraham Moles's *Art et ordinateur,* and other developments.[43] In the 1980s intensive experimentation continued with combinatoric computer-generated poems and expanded modes established by predecessors. Several programmer-poets, however, developed unique and sophisticated approaches of randomizing text via computer program.

In the United States various artists were working independently to create radically different types of algorithmic poems and eventually became associated with one another through their use of common programs, though no formal or institutional grouping was ever established. The creation of the computer program TRAVESTY (written in Pascal language) was a particularly influential event in that it led to subsequent works created by other artists and a greater awareness of the form. TRAVESTY was a collaborative effort by literary critic Hugh Kenner and computer scientist Joseph O'Rourke and was publicized in their article "A TRAVESTY Generator for Micros" for *Byte* magazine in 1984.[44] In brief, as Hartman explains in *Virtual Muse,* the program analyzes a text file and identifies successive patterns of letters and spaces (known as "character groups") and makes a "frequency table" for each character group in a document's source text (55). The user is prompted to set the desired amount of output and to set the size of the pattern length up to nine characters in the original version of the program. TRAVESTY is also significant in that the user is responsible for providing the input text; the program itself supplies no dictionary or database. TRAVESTY then scrambles (or permutes) the text by replacing each character group in the text with another (of the same size) located elsewhere in the source. TRAVESTY was both an aesthetic and technical innovation in combinatoric computer poetry. Works by other authors had been used as source texts for databases in the past (Lutz, Balestrini, and others), but TRAVESTY's approach to creating a digital poem involves a "manipulation" rather than a "generation" of text, as Hartman observes (95).[45] In TRAVESTY words or phrases are not recycled, but the combination or patterns of letters in the words themselves and spaces between words become the basis for the program's output. The program differed from anything else being done at the time. TRAVESTY is a self-contained generator that re-presents and radically processes a source text, a method now shared by several artists.

One established artist who began working with computer programming at this juncture was John Cage (whose music compositions were featured at

the Cybernetic Serendipity exhibition). Computers provided an excellent vehicle for Cage's work; since his 1953 composition *Music of Changes* he had promoted the concept of nonintention in art, a process in which the artist is no longer required to make decisions in her or his compositions but rather lets chance control creative expression. Initially Cage turned to the *I Ching,* "the ancient Chinese oracle which uses chance operations to obtain the answer to a question," to accomplish tasks for him (Retallack 153). Cage experimented extensively with the aleatoric *I Ching* process, a "discipline" that involved formulating a question and then using coins to divine numbers that provide answers to questions that forced him to, as Perloff writes in *Radical Artifice,* "break with ego, with habit, with self-indulgence" (150). He employed these chance methods as a writer as well, using the *I Ching* to structure poetic lectures and compose poems in the late 1960s. He would become known a few years later for a unique form of poetry known as "mesostics," also derived by use of the *I Ching.*

Describing the aesthetic and technical characteristics of the mesostic form, Cage writes in *I–VI,* "Like acrostics, mesostics are written in the conventional way horizontally, but at the same time they follow a vertical rule, down the middle not down the edge as in an acrostic, a string which spells a word or name, not necessarily connected with what is being written, though it may be" (1).[46] Cage's mesostics were ceremonial works he prepared for the celebration or memorializing of individuals or concepts. Literary works by Cage that involved computer programming were not published until 1990, though he started using digital technology to extend his practice of making chance-operational texts with computers in 1984. Cage initially made use of the program Mesolist, written by Jim Rosenberg (who later emerged as a prolific and pioneering digital poet in his own right; see chapter 3). Mesolist mechanically performed Cage's methodical "mesostic" treatment of texts. Until then, the tedious task of reading through a book, identifying words to be used, transcribing them, and restructuring them for the page had to be done manually. Cage's assistant, Andrew Culver, also created programs to manipulate and format text into poetry. Cage mostly used Culver's program IC, which emulates the calculations of the *I Ching.* He presented his first computer-assisted works in 1988 and 1989 in a series of lectures at Harvard University that are collected in his volume *I–VI.*

In *I–VI* Cage employs elaborate processes and contributes significant input in generating his nonintentional work. He composes or identifies a source text that he uses as an "oracle" and asks it what words to use for each

letter of the (vertical) poem, a process that, he writes, "frees me from memory, taste, likes and dislikes" (2). Mesolist lists all words in the source that satisfy the mesostic rule, and then IC selects words from the lists. The forty-five characters to the right and left of the chosen words in the original text ("wing words") are included, and Cage removes those he does not like (2). To prepare these lectures, Cage writes, "four hundred and eighty-seven disparate quotations have been put into fifteen files corresponding to the fifteen parts of [his text] *Composition in Retrospect:* method, structure, intention, discipline, notation, indeterminacy, interpenetration, imitation, devotion, circumstances, variable structure, nonunderstanding, contingency, inconsistency, and performance" (2). The source texts for the lectures included *Composition in Retrospect* and a range of other sources, including writings by Henry David Thoreau, Ralph Waldo Emerson, L. C. Beckett, Fred Hoyle, Marshall McLuhan, Buckminster Fuller, and Gene Youngblood, as well as articles that had appeared in daily newspapers. After using other formulas to determine the number of mesostic strings per file and then to reduce the volume of source material, Cage produced lectures of roughly twenty-five hundred lines each. After giving the initial lectures, he realized the need to establish a simple notational system that would instruct him to take a breath when reading the work aloud (i.e., " ' " [space apostrophe]) and indicate where to stress syllables that "would not normally be stressed but should be" (i.e., bold typeface) (5). In *I–VI* the mesostics are complemented by transcriptions of postlecture seminars, formatted at the bottom of each page. Cage masterfully presents several texts simultaneously: samples of the source text, the text generated from the source text, the text of his speaking, and questions asked in the seminars. A multidimensionality, indicative of this work as a whole, is apparent in figure 1.2, which two mesostic cycles connected to the concept of Interpenetration.

That this highly processed text yields discursive results is unsurprising. Strands of the poem communicate fragments of messages from within the messages that Cage selected for input text. That they can be followed and "read" (in an unconventional sense) at all is made possible by Cage's making selections in addition to the selections of the computer program. The original texts are torn apart, reconfigured, and paired conceptually and physically (on the page) with discussions about the work. The mesostics, registering graphically and syntactically on the page, are a mix of texts and words that require readers to develop a different sort of orientation to the text in general. In her discussion of this work in *Radical Artifice,* Perloff observes that

[To view this image, refer to
the print version of this title.]

Fig. 1.2. John Cage. Excerpt from "II," in Cage, *I–VI* (Cambridge, MA: Wesleyan UP, 1990), 103.

Cage prefers "to let us participate in the process whereby unfinished news items and bits of information . . . can be absorbed into the rhythms of individual consciousness; they remain discrete entities that we restructure according to our own predilections" (215). As Cage writes in the preface to an essay titled "Anarchy," quoted by Retallack, such works "do not make ordinary sense. They make nonsense. . . . If nonsense is found intolerable, think of my work as music, which is . . . a question of repetition and variation, variation itself being a form of repetition in which some things are changed and others are not" (Retallack 2). By positioning language as musical (the

result of repetition and variation), Cage reasonably directs a "new" orientation for readers and a useful lens through which to read many computer-generated works. A similar sense—of language that becomes musical—is found in works by Mac Low and some by Hartman (with and without Kenner), and Kenner describes the look of *Sentences* on the page as "Chant, therefore Voice" (*Sentences* 82). In *I–VI* the act and axis of reading are further complicated by the appearance of asynchronous commentary on the works (or answers to questions about the work) on the same page: the reader is presented with both horizontal and vertical language. The vertical language of the poem/lecture is scored for the page, but the prose at the bottom is in block formation, without punctuation.

TRAVESTY Extended

Hartman began working with computers as a student in the 1960s, and his aforementioned volume *Virtual Muse,* published shortly after the emergence of the WWW, presents a useful personal memoir on the development of algorithmic writing in the United States. Following two short essays that build his historical perspective, *Virtual Muse* primarily features explanations of Hartman's own works, along with some examples. Hartman's works demonstrate a seriousness, versatility, and engagement with programming ideas into mechanical works that is rigorous; he cultivates areas charted by predecessors with serious poetic intent, discovering uses for the computer that have made the machine his ally.

After creating a combinatoric "Poetry Composer" (see note 28) and a "Scansion Machine" that determined the metrical structure of a line of verse (to prove that scansion could be automated), he conceived a program called AleaPoem, which would be a "meter checker" built within a word processor, in order to "automate as much of the poetry-writing process as could be automated" (*Virtual Muse* 53).[47] Following these efforts, Hartman began to use TRAVESTY (which he believed examined "the relation between the original and its transformation and deduce[d] various things about the language of the original") to construct a long poem entitled "Monologues of Soul and Body," which is discussed at length in *Virtual Muse* (54).[48] Then, in a quest to find common ground between computers and poetry, Hartman reconfigured the Scansion Machine as a "productive" engine rather than an analytical one (66). He began by assembling a dictionary of common words that indicated each word's syllables, syllabic

stresses, and part of speech. Then—using a combination of two programs, Pascal and Prolog—Hartman wrote a program he called AutoPoet, which generated syntactically and grammatically correct poems. In doing so, however, he came to the conclusion that the problem with this type of work—and this could also be stated about the works reviewed above—is that it is "*imitation poetry*" in that the words, no matter how correctly they are constructed, "did only a little to drive the random words toward sense" (72). Through this process Hartman discovered that the complexities of combining human language and computer programming into a provocative yet understandable text is handled more capably in the creation of prose, which could be shaped into a poem. Thus, the AutoPoet's metrical filtering was removed and a writing tool called Prose was invented, which generated a sequence of syntactically correct sentences that were then edited into poetry.[49]

Inspired by his reading of Jackson Mac Low's book *Virginia Woolf Poems,* Hartman further explored permutation and combinatoric possibilities when he created the computer program DIASTEXT in the late 1980s. Mac Low created *Virginia Woolf Poems* using a "diastic" method he developed in 1963, whereby a phrase (or even a word) from a text is chosen, and then words in a source text that share the same verbal or letter patterns are extracted and used to create a new poetic work. Transforming Mac Low's arbitrary method into a program was not difficult because the process itself is algorithmic and does not involve random elements. The program is capable of rapidly performing the artist's deterministic tasks once an input text and "seed" phrase are chosen (*Virtual Muse* 96). Mac Low was pleased with the program and used it to compose several poems and books.[50]

Mac Low began working earnestly with DIASTEXT and DIASTEX4 (which allows the user to choose and employ a separate index instead of using the whole source text as the index), along with TRAVESTY, in 1989. These programs profoundly influenced his title *42 Merzgedichte* in Memoriam *Kurt Schwitters* (1994). Just as Cage used programs to facilitate work that he had previously performed manually, Hartman's program mechanically accomplished—with some variation and advancement—the procedural work that Mac Low had practiced for many years. Also like Cage (and Hartman), Mac Low's text involves a significant degree of systematic editing and author intervention in addition to the computer programming. *42 Merzgedichte* grew out of a series of writings titled "Pieces o' Six" (1987), in which Mac Low first used a computer (word processor) to transcribe, modify, excerpt, and interpolate the works of others in a process he describes as "im-

pulse chance" (*42 Merzgedichte* vii). Once his attention became focused on Schwitters, Mac Low devised a computer program that would randomly select linguistic units that his initial poem for Schwitters ("Pieces o' Six: XXXII") stored in a "glossary" in Microsoft Word and process these fragments into what Mac Low describes as "entirely new constellations" (viii). Over the course of two years Mac Low implemented modifications to the program and its glossary and made other adjustments to create a substantial body of poems. With "*31st Merzgedicht* in Memoriam *Kurt Schwitters*" he began to incorporate DIASTEXT and TRAVESTY into his process; his uses of the programs were very intricate and precise:

> I utilized these programs in different ways, employing earlier *Merzgedichte* as source texts: (1) For the *31st Merzgedicht,* I ran the *25th Merzgedicht* through DIASTEXT alone. (2) For the *32nd,* I ran the *4th* through DIASTEXT alone. (3) For the *33rd,* I ran the *2nd* through DIASTEX4 alone. (4) For the *34th,* I ran the *8th* through DIASTEX4 alone. (5) For the *35th,* I ran the *9th* through DIASTEX4 alone. (6) And for the *36th* through the *42nd,* I ran the *29th* first through TRAVESTY, asking for "low-order" output—i.e., scanning for sequences of very few characters, to insure the outputting predominantly of letter strings that aren't real words (pseudo-words), along with a few real words, most of them embedded in pseudo-words—and then through DIASTEX4. I also submitted the output, in most cases, to certain systematic types of postediting, mainly of format and capitalization, some of which amounted to final chance operations. (*42 Merzgedichte* ix)

The pre-DIASTEXT Merzgedichte vary in length; many of them are one or two pages, but others are longer (one exceeds twenty pages, and several exceed ten). The first is a collage of sentences, many of which are complete. Some of the sentences remain complete in the following thirty Merzgedichte, but mostly the text becomes more and more discursive; its pieces become more abstract and challenging to read in any conventional sense. Since Schwitters and Dadaism are clear influences, however, this unconventional presentation of expression is not surprising. Mac Low's processes and programs allow him to perform Dadaist operations to an even more complex degree, as the words themselves become broken up and collide with other words—in multiple languages—to form neologisms and enjambed

phrases. These characteristics are overt in the "*29th Merzgedicht* in Memoriam *Kurt Schwitters,*" in which just a few words at a time remain intact:

> ***Ich Wer*'s leaf *I am went* en stone houses cliffs Whirl-heap blood's leaf**To the Berlin Dada
> group the Sturm group symbolized what was bankrupt in G ***I am a painter and I nail my pictures together.***
>
> ***Art to Schwitters was as import*** ication to join Club Dada was rejected.
>
> ***d durability of his private,***
> ***invented world,***
> ***a* luminous im arn evoked the wonder of a natural curiosity.**
>
> *His* **lifework** *was never finished.* (*42 Merzgedichte* 159)

Some of the biographical content in the first Merzgedicht ("Pieces o' Six: XXXII") remains intact, enough so that the focus clearly remains on Schwitters. A reader who is unfamiliar with Schwitters's life or his works will be informed or infused with them by the permutation of this text, which begins with Mac Low's subjective excerpts and interpolations of works by and about Schwitters as described above. In the passage above, the repurposed words and language provide not only a sense of the aesthetics of the original work (collage) but also a critical perspective about the text Mac Low has chosen to use as input.

"*31st Merzgedicht* in Memoriam *Kurt Schwitters,*" the first DIASTEXT poem, is thirty-six pages, the longest piece in the collection. This piece includes many different styles, though none of the formatting or visual/typographic changes seen in the earlier pieces is present; the entire text is nearly impossible to follow semantically. The dialogue between Mac Low and Schwitters's work is fragmented, but not broken, by DIASTEXT, compounding the general sense of Schwitters and the potency of his work. The resulting text is a microcosm that continues to relate to the objectives of Merz and Dada, paths Mac Low followed, explored, and expanded. Many of the linguistic shards presented in this long piece are already familiar to readers who have absorbed the thirty Merzgedichte that preceded this one, and

further information is presented via additional processing. For instance, phrases such as "juxtapositionselements publisher" aptly describe Schwitters's endeavors (196). The fragments are unquestionably difficult to connect in any conventional way, and the collisions in the language pose greater challenges. Nevertheless, essential components of both artists' objectives are glaring. Progressively deepening degrees of Dadaism occur as the computer permutes fragments of fragments, which are further fragmented by DIASTEX4. Given Schwitters's penchant for collage, and the development of a practice he called "Merz" (artwork described in the Schwitters collection *pppppp* as combining "all genres into an artistic unity" [quoted in *pppppp* xv]), these extremely splintered works by Mac Low are a powerful and appropriate homage to Schwitters.

The aesthetic connection between Schwitters and the concept of Merz is extended by the visual components of Mac Low's poems, and, furthering the sense that his conception is truly multimedia, Mac Low (like Cage before him) views these works as musical compositions. In the introduction to *42 Merzgedichte* in Memoriam *Kurt Schwitters* he writes: "Words, phrases, sentences, and other linguistic elements are treated like the tones or intervals of scales or of tone rows, melodic themes or motifs, or rhythmic figures, recurring again and again (in full or fragmentarily) in various combinations and concatenations" (ix). Thus, we see the most advanced practitioners of digital poetry at that time using digital media to extend the parameters of a written work so that it takes on an alternative identity. Poetry has always had an association with lyricism, but in these works the words are no longer vehicles for semantic meaning but literal sound bites (and bytes). Using nonverbal media permits Mac Low to pronounce the conglomeration, if not confusion, of forms.

The concepts and programmatic effects of TRAVESTY directly influenced at least one other program, Michael Dickman's TextMangler 1.2, which also requires the reader to provide the database (or input text). Developed in the 1990s, TextMangler takes previously existing texts from the viewer's hard drive and algorithmically rearranges them. The program, explains Dickman in the program's Help file, uses THINK Pascal source code to "display the result of 'mangling' a file or calculating a character frequency table." Readers must load a text file into the program, which then uses a "Markov table" to rearrange the words. A Markov table produces randomness so that at any given moment the text's future is independent of its past; one piece of information in a text bears no influence on another.[51] This table

(or "chain") is not particularly useful for the reconfiguration of poems, as it works better with longer documents and does not take poetic aspects, such as line breaks, into consideration. Though the program is similar to TRAVESTY in some respects, and certainly mangles texts, it does so to a degree that every output looks exactly the same. Like TRAVESTY, Text-Mangler essentially destroys a poem in the process of making one.

Other constructive text-generation experiments during the late 1980s were produced using the program HyperCard, a Macintosh hypermedia presentation mechanism with a powerful scripting language whose basic functions can be learned easily. Xexoxial Endarchy, an experimental arts group based in Wisconsin, cofounded by mIEKAL aND and Liz Was in 1985, pioneered new applications for HyperCard in several projects.[52] Xexoxial also made two HyperCard productions (or "stacks") that are constructive devices: PataLiterator (1985) and an *Internalational Dictionary of Neologisms* (see chapter 3). PataLiterator, written by aND (initiated 1985, published 1987), is used to "manufacture a neologistic vocabulary hence literature" by generating either single words or texts up to forty pages using an amenable database of phonemes and syllables. Described in the Xexoxial Endarchy catalog as a "collage de 'pataphysique' " and a random " 'patalinguistic' chorus," PataLiterator attempts to apply "the art of hyperpataphysics" to Alfred Jarry's late-nineteenth-century proclamations. PataLiterator opens with a screen that shows Jarry's "Ubu" and presents four buttons: "About," "Help," "Start," and "More." Pressing start activates the screen shown in figure 1.3, which viewers use to produce text and alter the databases that feed the output.

The straightforward interface of black and white (grayscale) design consists of scrollable databases of phonemic and syllabic information of all sorts. This interactive screen permits viewers to add or remove elements from the syllabic database. PataLiterator uses splintered grammatical elements to create output instead of whole words; the HyperCard stacks containing the fragments are programmed to randomly shuffle pieces of words together to create and collect unique electronic texts, which can then be printed. Neologisms are made by pressing the "Word" button and appear in the scrollbar box on the lower right (e.g., *brayltate* in fig. 1.3). "NeoTrigger" is the function that can be used, according to the instructions, "to turn out a novel length text in an invented language in just 4 hours"; the "Empty Book" button removes any strings of text that the program has previously produced. The program accomplishes its tasks through several steps, each of which occurs on stacks that are not shown to the viewer. First, each word

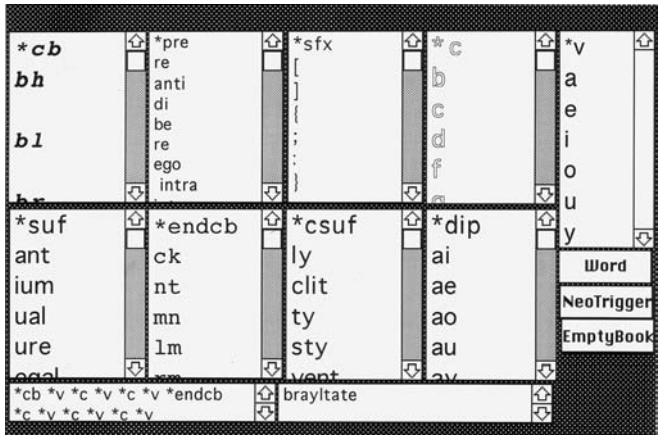

Fig. 1.3. mIEKAL aND. Screenshot from PataLiterator interface, April 22, 2004 (Madison, WI: Xexoxial Editions, 1987).

is arbitrarily generated from the given (or entered) syllabic language. A separate part of the program assembles words into sentences; then another part of the program forms the sentences into paragraphs, and another organizes those into an output in a separate file. In this unusual advancement of computer poetry, PataLiterator randomly permutes many syllabic fragments in order to construct texts that would be considered nonsense by conventional standards. But since the ostensible objective of the program is to reify the uncompromising tenets of Russian futurist writing (including transrational language and poems made from verbally based sounds), it is a considerable achievement.

A program produced in the 1990s effectively incorporates several of the types of work discussed above (both conventional and unconventional) and adds additional elements such as sound and visual effects (a fact that sets it aside from the other programs, which exclusively privilege alphanumeric representation of language). *MERZ poems,* created by Valentine and Rogers, is a multifaceted text-generating program that not only enables a user to customize words in its database but randomly produces works with sonic and graphical elements.[53] At the opening interface the user chooses between "words" and "pictures" and whether to include randomized sound accompaniment. While Valentine and Rogers effectively use Dada and nonsense in this work, they have also created a program that enables users to construct easily readable (grammatically "correct") poems as well.

The "words" link on the opening page brings the user to the main inter-

face, where several types of poems are classified and indicated on seven buttons: "?" (help), "Merz Line," "Merz Poem 1," "Merz Poem 2," "Edit Data Set," "Semi-Random Haiku," "Merz (Random) Haiku." Activating a "Merz Line" produces a six-word line in the center box with elements drawn randomly from the database (for example, "charts sprints choirist oddly weep pleading" [April 22, 2004]).[54] The "Merz Poem 1" consists of completely nonsensical language and appears in the upper box when activated. Vowels are either absent from, or atypically combined in, many of the constructed "words" in a "Merz Poem 1"; such features ensure that the texts are gibberish. Bits of words are selected and rearranged, offering no possibility for conventional words or linguistic clarity, as in this example:

bmf
b dbd
jvev
z vp xxiiss z jahks
rhx mwpso qkwim. (April 22, 2004)

"Merz Poem 2" generates three- to five-line poems in the lower box:

squishs squirting beging raw runing cut
links cuts brownest high runs
ram creeping squish his bend crawling. (April 22, 2004)

In my customized program I have removed verbs that require adding letters for an *-ing* suffix (such as "beg" and "run" in the first line in the example above) so that only proper words appear: "yak hip clawing sock yawning flauntest / snorting singing walks sleeps drink clear" (April 22, 2004).

The "Semi-random haiku," most formulaic and predictable of the Merz poems, appear in the upper box. Each poem of this variety is built with the same stanzaic structure, including predetermined suffixes on some verbs and adjectives: a six-syllable line (determiner + adjective + noun + verb + adjective), followed by a five-syllable line (determiner + noun + verb + verb), then a two-syllable line (determiner + noun), and a four-syllable line (determiner + verb + noun). Despite its fixed approach, the program is capable of writing atypical, compelling haiku:

Green bold lip screams eagerly.
Her rain sells snarling.

This barn,
one morning sun.
. . . . . .
Our low sun bends shortly,
Fate's snail yawns pleading
Each sun,
each clawing moon.
. . . . . .
This poor room prays darkly
The beer moans charting.
Their sin,
any turning goose. (April 22, 2004)

The fact that each poem is in precisely the same format (i.e., uses the same template) is obviously not an advancement, but it is significant that the user can edit the database and therefore customize and perhaps further the program's Dadaist roots. The authors' note states that in order for the program to create perfect haiku, only one-syllable words can be used in the dictionaries. As soon as multisyllable words are added, the traditional structure is subverted.

The "Merz (Random) Haiku," which also appear in the upper box, are similar to "Merz Poem 1" (in that they apply the Dadaist and futurist techniques of inventing unpronounceable words to represent sound, are brief, and contain lyrical and pointed stream-of-consciousness narrative), although the syllabic fragments are extended over three to five lines. These poems pay little attention to structure in any language:

Seelnscheilntharch pert choolpklourtplaes
loudvurd veedkeelch
doufcleilkthoorb dealbklop jun. (April 22, 2004)

Though the program occasionally constructs a "real" word (like *pert* in the example above), the "(Random) Haiku" are completely nonsensical. As such, they are reminiscent of some of Schwitters's more extreme works, like his number poems and "Ur Sonata," the famous sound poem:

Rumpftillfftoo?	Rrrrrrum!
Lanke trr gll?	Rrrrrrum!
Dedesnn nn rrrrr?	Rrrrrrum! (*pppppp* 79)

Fig. 1.4. Randolph Valentine and Doug Rogers. Detail from "pictures" section, *MERZ poems,* version 3.1, June 1992.

Though derived by using a completely different process, some aspects of the "words" section of *MERZ poems* also reflect traits of Mac Low's *42 Merzgedichte* in Memoriam *Kurt Schwitters.* This is unsurprising, since both works share a mutual inspiration.

Following the "picture" link on the *MERZ poems* entry page brings users to an entirely different set of textual circumstances. This section of the program, once activated, creates random drawings "by randomly applying various HyperCard graphic commands, randomly inserting bits of text, and randomly inserting a few line drawings." The drawings are rudimentary, largely relying on contrasting, overlapping symbols (which are sometimes kinetic) to captivate the reader. Some of the preprogrammed images are words created graphically; if several phrases or words appear simultaneously, a poem may emerge on the screen, though most of the graphical elements involve shapes and lines (fig. 1.4). The verbal content of these visual poems is minimal, coming in the forms of words or brief phrases that pop up amidst graphical materials.

In some ways *MERZ poems* is reminiscent of earlier haiku generators, though the program is capable of generating more than a single style of poem (a fact that in itself makes the program unique). The way that the

interface of the "words" section produces and presents the work allows users to view three different types of poems created simultaneously: a "Merz poem 1," "Semi-Random Haiku," or "Merz (Random) Haiku" at the top, a "Merz line" in the center, and a "Merz Poem 2" on the bottom. Juxtaposing three independently produced poems created by the same database but with different rules, which appear at the same time, is a new approach for the presentation of computer poetry:

Honest dead man mourns calmly.
A bud stands turning.
Honest snail,
any reading face.

---

horse fleeter cheat sleep calling calling

---

clear dear read rich calmer chirp. (April 22, 2004)

The program's versatility is particularly unusual; it can create impromptu, adjustable, visual, and verbal poems. My own experimentation with the program has included using it during improvisational music/poetry performances, where it has proven itself useful.[55] The program's well-designed interface makes it easy to generate the poems and to customize the verbal database. Making the program work as a productive tool revolves around selection at two stages of the process: choosing words to include in the dictionary and selecting the best examples of poetry made by the program.

Though the section above focused on projects produced in the United States, I do not mean to suggest that drastic innovation was not occurring elsewhere. During the 1980s intensive experimentation with text generation also continued in Europe. The first major development emerged when Paul Braffort and Jacques Roubaud established A.L.A.M.O. (Atelier de Littérature Assistée par la Mathématique et les Ordinateurs), a workshop of mathematics and computer-assisted literature associated with Oulipo, in 1980.[56] According to the *Oulipo Compendium,* A.L.A.M.O. perceived three distinct levels of digital literature: combinatorial (the computer as an "efficient tool for redistributing interchangeable elements in works"), applicational ("substitution and filtering" elements produce suitable grammatical structure), and implicational ("aimed at using generative components such

as the principles of narrative logic to make possible the creation of complete, complex works") (Matthews and Brotchie 46). The *Oulipo Compendium* asserts that combinatorial and applicational works in the form of unique titles were an "inadequate approach," and A.L.A.M.O. proceeded to focus on developing "litware"; this concept involved two phases: prescription, "in which restrictions are chosen for three categories of literary materials (roughly, syntactic, semantic, and organizational)"; and referentiality, in which "the author greatly simplifies the work of prescription by using the structures of existing works" (46).[57] In the essay "Poetic Machinations" Philippe Bootz introduces early digital forms of literary publication cultivated in France, including a "telematic art review," *Art Access,* which used the French telephone system (Minitel) to create publications in 1985 and 1986 (121). Bootz and associates Frédéric Develay, Jean-Marie Dutey, Claude Maillard, and Tibor Papp, poets who had already begun to explore digital writing, formed a research group called L.A.I.R.E. ("Lecture, Art, Innovation, Recherche, Écriture") and initiated *Alire,* an electronic journal published on computer diskette, in the late 1980s. *Alire* diverged from A.L.A.M.O.'s creative impetus by not focusing on text generators but primarily presenting poems with kinetic or animated graphical works (although editions of *Alire* do contain generators by Petchanatz, Papp, Balpe, and *Syntext*). My emphasis on North American works results primarily from having closer access to the materials.

Observations

The creative spirit and impetus of the era, to combine randomness with order through intricate, technical art, alters the human relationship with language. Cyborgian poetry, works cocreated by humans and digital machinery, emerged from these experiments. The works introduced above prove that language can be digitally processed into shapes or sequences to create a type of synthetic poetry. Computer poetry has roots in Max Bense's theory on artificial poetry, but from its earliest manifestations in Theo Lutz's work computer poetry has been a predominantly disconnected movement, without central figures or theories. An argument could be made that digital technology available at the time better suited "operational" poets, whose work was computational in character (and, later, poets whose work would be graphical or nonlinear). Mac Low perpetually used the computer because the device facilitated the type of work he had been doing for many

years. Someone who wants the computer to write a Petrarchan sonnet, for example, and expects it to write it as well as Petrarch, is asking the machine to perform the wrong type of task.

From a general point of view, the majority of combinatoric and permutation works produced in this period feature variations, extensions, or technological implementations of Dadaist technique. Many aleatoric poems contain few parameters and, at the very least, share sensibilities common to open-form poetry. Somewhat ironically, however, the poems are not pure-chance occurrences—they are preconfigured to be randomized, and some examples contain fixed attributes, as in slotted works, where the author strives to imbue rigid syntax or comply with established parameters. Digital poetry made with text-generating programs gradually developed into a multifaceted form of its own, exploring many styles of literary expression.

Typically, text generators rapidly produce many poems, using a programmatic formula that selects words from a database to create output. Computers cannot be programmed to engineer a "perfect" poem; some poets use the computer to alter or subvert typical forms of expression; others seek to be imitative. In either mode selecting appropriate input text is the most important element in the process of pronouncing meaningful expression. Whoever establishes the database coauthors the poem, as does the writer of the program; the user of the program also has authorial prerogatives in selecting from and editing output. TRAVESTY in particular highlights human input through the imperative role of the source or database on the computer-generated poem; as Stefans observes in *Fashionable Noise,* "Without 'human' intervention nothing can get into a CP [computer poem] that is not in the database or acceptable to the program" (65). Computer poems challenge and invite the reader to participate imaginatively in the construction of the text; some mock the conventions of poetry, and others reify them.

In the preface to *Computer Poems* Bailey asserts that the poets included in the collection were waging a battle to free language: "Computer poetry is warfare carried out by other means, a warfare against conventionality and language that has become automatized." The poet now automates randomization, communicating with the computer regarding how and where chance transaction occurs. From a contemporary perspective, however, it is difficult to appreciate the battle carried out by many of these works. Most selections included in *Computer Poems* have a very standard appearance (with every line of the work justified to the left margin), and many display similar

traits such as repetitive words or phrases and patterned grammatical structure. While coding and schemes for computer poems can generate moments of provocative poetry, their use does not automatically produce significant work. Bailey's presentation of what are now considered fairly conventional works demonstrates the integral value and primacy of the database. If one chooses language from "classical" poetry to compose a database, the computer program might emulate that style of writing (though Chisman and others have chastised this pursuit). Bailey's comments seem to suggest that computers can enliven the presentation of the form in general, though whether these authors succeed in doing so is questionable. In spite of these debatable aspects, the poems are stimulating in several ways. As poetry and literature have done since their earliest incarnations, these works can quickly transform the reader's mind-set (by pushing a button instead of turning a phrase or other improvisational, spontaneous techniques). Someone interested in reading something new, something that will perhaps jar his or her senses, will especially appreciate these efforts.

In contrast to Bailey's view that computer-oriented work battles convention, Morris expects what one would expect of a gifted poet, writing in his essay "How to Write Poems with a Computer": "The computer must pay attention to rhythm and sound, and must somehow link texture with semantics to make each one complement the other—all without becoming obnoxiously evident in its task. It must grow banal when speaking of banalities, cool or crisp for the displeased mistress, hot and languid for a summer shower. At times it must play with the sheer sounds of words" (Whitman's 'Weapons shapely, naked, wan')" (19). He suggests that randomness counterbalances the algorithmic but also that computerized randomness is not as connected to a work as a poet's internal, intentional efforts at randomness. In the end Morris argues essentially that computers and programming are incapable of capturing the nuances of poetry. Morris's outlook is extremely conservative, and in my view his perception that computer poems should strive to be (or even outdo) traditional poems is misguided.[58] Poetry *is* poetry, and computer poetry—though related to poetry—is computer poetry. To expect a machine, or a human-machine collaboration, to do the same thing that a human does not only squelches experimentation but also imposes impossible expectations on the work. Formally scrutinizing these poems is valuable, as is holding them to variable standards, but the conventional viewpoint expressed by Morris needs some adjustment and should

take the technological character of the work, as well as trends in postmodern poetry, into consideration.

Many early computer poets sought to establish a vernacular with humanistic sensibility; others were intent on machine processing. One can see the first characteristic in Balestrini's appropriation of Lao Tzu and *Hiroshima Diary,* in Auto-Beatnik's compassion or lack thereof, and in the overt naturalistic projections in most of the haiku programs; the second informs TRAVESTY, Cage, and PataLiterator. Yet digital poems that eschew human sensibilities are not as dehumanized as some critics would assert. In addition to the fact that a computer never acts alone to generate a poem, machine artifice can teach us about language (demonstrated by Kenner and O'Rourke's program).

The generation of a computer poem is a fusion between the software/algorithm and the interface. The materials transform a set of words in a database into contours of poetic expression. The production of serial texts and mutations and manipulations of the language in a database open the possibility of a continuous perpetuation of language and ideas. Writing a computer program that will generate captivating text involves multiple imaginative steps. As Masterman observes, "the ultimate creative act for the computer poet lies in writing the thesaurus and in filling in the semantic directives. Thus the human creative process is pushed one stage further back; and the poet composes a poetic system, which can produce for him any number of poems formed from a given frame, among which he then chooses, rather than himself straightforwardly writing one poem, and then altering it" (quoted in McCauley, *Computers and Creativity* 115).

Two approaches predominate text-generated poems. The initial method involves manipulating an extant text or phrase and re-presenting or rearranging the words, as Theo Lutz did when he created his "Stochastic Texts." The second, more pervasive, method involves creating a program to select words from a database comprising multiple "lists" and then forming them into lines or sentences. Programs either incorporate original texts (words, phrases, sentences) written by their authors (or by someone else) in the database, or they enable the viewer/reader to add text(s) to the database. The programs typically reveal words on the screen, without requiring the reader's input once the program is engaged; as with any other poem, "meaning" is open to interpretation, and the reader can, of course, edit the text. Milic, in his entry on "Computer Poetry" in *The New Princeton Encyclope-*

dia of Poetry and Poetics, describes problems with the nature of the language in these types of poems, including ill-formed syntax, inverted grammatical constructions, violation of semantic rules, nonsensical metaphors, and repetition. On the other hand, he states that advanced programs, which produce unexpected juxtapositions and poems that benefit from varying structures, have "fresh" and "outrageous" characteristics that "contribute to a more accurate notion of poetic language" (231).

A comparison between some of the more conventional works in *Computer Poems* and atypical productions by TRAVESTY, Mac Low, and Cage clearly reveals that some computer poetry, for better or worse, more closely resembles traditional forms. "There are several reasons for a maker of computer poems to aspire toward 'conventional' form," writes Stefans, "not the least of which is that the computer poem only becomes activated when it takes on a 'parasitic' relationship to a functioning, socially recognized host, in this case the publishing industry and academia" (*Fashionable Noise* 148). Stefans does not directly dismiss such work but likens it to a "virus" (148). Norwegian critic Espen Aarseth vehemently challenges traditional approaches in "The Cyborg Author: Problems of Automated Poetics," which identifies two problems with most models of computer poetry and poetics. The first involves the appropriation of traditional genres and formats as foundations for digital literature, which set up "unrealistic (and irrelevant) goals"; the other problem is the "uncritical use of traditional literary theory in the criticism of participatory literature," which impedes the investigation of how it differs from traditional narrative and media (141).[59] In slight contrast to Aarseth I see this adaptation of historical formats as a logical starting point for the exploration of digital poetry, though I agree that a one-to-one correspondence between past and present modes is largely ineffective (except perhaps as a springboard for future digital works).

Nonetheless, evidence of permutation and patterning is seen throughout the computer poems above, a characteristic connecting this work to the history of poetry. Japanese tankas (circa AD 800), medieval triolets, sonnets, and so many other forms of poetry consist of highly patterned language. Computer poetry has undergone much experiment and refinement over its brief course; however, it may be in a very early stage of development. Computer poems may be codified over time just like the tanka, triolet, and sonnet. So far, poet-programmers have forged many textual arrangements and developed fresh approaches to composition, without overtly shared central concerns or aesthetic uniformity. A new medium makes new demands and

raises expectations on the formulation of content, presenting problems that are gradually solved by developers. For instance, in the lineage of digital haiku, Masterman and Wood's model shares some traits with, but is primitive in comparison to, *Haiku Master.* Since intensive research by scholars/writers/programmers such as Morris occurred between the two productions, substantive development is not surprising.

The quantity of work and the depth of practical and theoretical investigation solidify text generation as a cornerstone form of digital poetry. Randomly generated, permuted texts (or texts with media files) will always be a component of digital poetry; Balpe, Glazier, and others continue their research in this area.[60] Digital poetry *began* with the advent of computer poems more than three decades prior to the WWW, and authors writing in the WWW environment extend the form into the present. Regardless of the early work's aesthetic strength or weakness, it proposes models for text that are evolving alongside computers.

Poetry has always involved both structural and randomized elements, imagery, and intertextual relations. In its public form a poem customarily presents language with stimulating elegance or lyricism. Any type of digital poetry, especially if it refers to itself as poetry, should be expected to embody these qualities. The subtextual programming code must possess its own elegance—information that exhibits unexpected qualities—for an output text to make an aesthetic impression. Text that fails to incorporate internal variation quickly becomes mundane, and while many computer poems are repetitive and monotonous, many are exciting and surprising.

Creating a poem with a computer program is a cyborgian endeavor. Whether generated by an author-programmer or initiated by a reader-participant, digital machines use human input to formulate language (and possibly other elements) on command. As Jean-Pierre Balpe comments in "E-Poetry: Time and Language Changes": "The texts of e-poetry aim then to be infinite, not eternal; they want to never cease speaking, not to remain in your memory as something unique and perfect" (7). This perspective on digital poetry calls attention to the process of the work, which may not result in the composition of an ideal text. In the same essay Balpe expresses a viewpoint that text generators do not create individual, autonomous poems but rather a single cumulative poem "which takes different forms and which is changing for you, in real time, speaking in various manners of your relation to time: real time and infinity of time. An e-poem is therefore something like a multidimensional text which changes in meaning

depending on the place and time of its reading and which can be apprehended in its totality only by great numbers of different readings" (6). Sustained attention to authorship and to reading text, encountering and overcoming problems over years, is the best way to judge the possibilities of any composition—digital or analog.

2
Visual and Kinetic Digital Poems

In the late 1960s digital poets began to focus on using computers to make graphical representations of and with language. This advancement—foregrounding the visual aspects of language at least as much as the verbal—marks several changes in the development of digital poetry. In contrast to works discussed in the previous chapter these visual and kinetic works largely employ *mutation* as opposed to permutation. As with text generation, these works use mechanized language expansively, although most deemphasize randomized output. Static and kinetic visual works introduced a poetry of sight, overtly conscious of its *look,* sited on and incited by computers; standard typefaces became a thing of the past. Digital poets (and those working with video and holography) began to work with poetry that was literally in motion.

When the technology became available, artists began to create digitally animated works and manipulate language to heighten visual properties. These digital poems participate in a larger poetic trend, for, as Perloff observed in *Radical Artifice,* "the speech-based poetics of mid-century has given way, more and more, to the foregrounding of the materiality of the written sign itself" (137–38). Digitally produced visual elements first emerged in randomly generated poems, then in two-dimensional static works and other manifestations. The initial works were, like text-generated poems, automatically spawned by viewers confronting a program in an installation setting. With the development of graphics software, subsequent works embodied visual methods that approximated concrete and visual poems rendered and fixed on the page. In contrast to the productions of the earliest visual poets (e.g., Marc Adrian and Carl Fernbach-Flarsheim), these

later works are not interactive. The computer became a convenient tool to manipulate the appearance and presentation of text. Some titles closely follow earlier manifestations of visual poetry; others (like videographic and hypermedia productions) venture further afield and do not aim simply to reconfigure the style of poems that are read and understood exclusively through alphabetic language. These visually modeled, seemingly wordless, poems (see André Vallias below) are, in many ways, artistically rendered statements on poetics rather than poems. Such presentations are unique and appropriate to include in a discussion regarding the pantheon of digital poetry, even if their graphical rendering overshadows their verbal qualities.

As hardware and graphical programs were developed in the 1960s, a few poets began to use digital tools to create visual poems. By the 1980s poets increasingly presented moving language on screens as a result of the development of PCs. These efforts foreshadow many later experiments in poetry that proliferated in animated, hypermedia (digital) formats. Kinetic poems long predated a style of digital poetic practice that erupted with the emergence of the WWW, typified by works such as Brian Kim Stefans's *the dreamlife of letters,* as well as those found archived on Komninos Zervos's *Cyberpoetry* site and elsewhere.[1] Groundwork for today's animated digital poems (e.g., those made with Macromedia Flash) was in fact underway by the mid-1970s in coded works such as Arthur Layzer's "textured animated poetry" (written in FORTRAN) that featured words "streaking" down the page (McCauley, *Computers and Creativity* 118).

With the advent of publishing projects such as Xexoxial Endarchy and dbqp (founded by visual poet Geof Huth), digital processes became overtly implemented in static visual poems. By the mid-1980s the influence of poststructural critical theories, such as deconstruction, spurred poets to challenge their imaginations and invent new appearances for poetry. While some artists, like André Vallias, eschewed the use of words on the surface of their works, most did not reject language but worshipped it more deeply, a spirit divulged boldly on the dbqp WWW site: "Once the religion of the sacred word became obsolete, the word itself became the object of our reverence." Bob Grumman's entry on "Visual Poetry" in *A Companion to 20th-Century American Poetry* reports that numerous visual poets were using digital methods in the 1990s, each of whom steadily published in alternative magazines, including Guy Beining, Crag Hill, Huth, Jonathan Brannen, Mike Basinski, Stephen-Paul Martin, Jake Berry, aND, Was, Grumman, John Byrum, and John M. Bennett.[2] The form ultimately grew, but—as with

text generators—it was not a consolidated movement. Though book artists such as Johanna Drucker and others have worked in vibrant fixed forms, a strong desire to move beyond static works was evident from the beginning, and poets began to explore the new material conditions that computers enabled.

Historical Forebears

Since the earliest analytical texts regarding digital poetry, concrete poetry—a literary movement that sprang from explorations of visual semiotics in Germany and Brazil in the 1950s—has been identified as a significant influence. This perceived influence is sensible given the concretist promotion of the visual presentation of intentionally placed verbal elements, graphical effects, sculptural interplay of letters and words through bold typography, coloration, and repetition, all of which can be found in various examples of digital poetry. Computers clearly enable and extend ideas invoked by concretist aesthetics; digital works reflect, if not expand, similarities, while also being something altogether different. Although I intend to explore examples of graphical digital poems as an advancement of concrete poetry, this discussion also identifies distinctions between graphical digital and concrete poems. The aesthetics and motivations of the computer artists embody and diverge from compositions displayed and discussed in anthologies of concrete poetry. A relationship between graphical digital poems and concrete works often exists on the surface but is not intrinsically supported with shared ideologies or methods, especially in contemporary forms where fewer (if any) elements are fixed onto a page.

As discussed in the introduction (and illustrated below), Mallarmé's influence on digital poems is considerable. Beyond its rejection of standard use of the page and syntax, as well as its promotion of randomness in events, the construction of "Un coup de dés" unquestionably plays a role in works of digital poetry that reflect a dispersal of language. Mallarmé successfully reconceived what a poet can do in the space of poetry in several ways, and in addition to its other rejuvenating aspects this poem's visual appearance gave authors permission to arrange poetry using inventive graphical methods. The work of e. e. cummings also presumably helped to liberate lines and formations of poetry from strict arrangement. Crafted visual and illuminated poetry, of which there are many examples, has a rich history that spans centuries and includes works such as "Calligrammes" and

"Easter Wings." These are just two of many models of verbal-visual artistry that can be marked as significant precursors of the form. As mentioned previously, Pound's interest in ideograms, or images that connote verbal information, is also pertinent to this form, as is the imagist inclination to put as much information into as few words as possible (in order to present, as Pound writes in the essay "A Retrospect," "an intellectual and emotional complex in an instant of time" [37]). Olson's concept of "composition by field," introduced in the essay "Projective Verse" (1950), which argues against inheriting the "line, stanza, over-all form" of "old" poems and emphasizes "kinetics" ("a high energy-construct and, at all points, an energy discharge"), "principle" ("right form, in any given poem, is the only and exclusively possible extension of content under hand"), and "process" ("how the principle can be made so to shape the energies that the form is accomplished") also indicates that poets sought to break away from tradition by establishing a different look for literary forms (148). Projective works, in Olson's view, use the "machine as a scoring to his composing, as a script to its vocalization" (154). Olson's perspectives on the use of the typewriter, which "sound a call for the scriptural imagination to engage the materiality under one's fingers," writes Glazier, suggest that "literary form can be revitalized" (*Digital Poetics* 24).

The 1970s and early 1980s were a bridge period, where most (but not all) visual poets still produced their work using analog methods, before common graphical software programs were refined and became available via personal computers. For instance, Richard Kostelanetz's *Visual Language* (1970) was composed using typewriters, stencils, and photostat technology. Concrete poets had used Letraset fonts and other means to sculpt poems with unusual, inventive typefaces. Such practices do not reflect a resistance to using digital media as much as a lack of access (Kostelanetz began to work rigorously with computers when they became available to him). Much of the creative output from the 1970s and 1980s—intended for print rather than for computer presentation—shows similar characteristics: letters or words using an array of fonts to indicate multiple dimensions of text, altered or repeated words on the space of the page, and some pictographic works.

In the period following concretism visual poetry appeared in a number of anthologies, though not all feature digitized works. Even some of the most notable books made little effort to distinguish digital from nondigital works or to discuss the impact of computers on visual poetry. Despite the

fact that in recent years the *Electronic Poetry Center* has begun to clearly distinguish digital poems from print-based works (and keeps a separate index for digital poets), few WWW sites, even those that have titles that would indicate a concentration in the area, such as *Arte Visual: Poesia Visual e Arte Digital* (created by Hugo Pontes and Victor Hugo Manata Pontes in 1995), Philadelpho Menezes's *Estudio de Poesia Experimental,* or *UbuWeb* make technologically based distinctions between works or address the proliferation of digital poems. These productions emphasize a sense of continuum between past and present methods. *UbuWeb* (developed by Kenneth Goldsmith in 1996) was a particularly concentrated effort to present both conventional and digital visual works within a compendium that unites kinetic, aural, and visual poetry.[3] *UbuWeb,* along with several other (less extensive) WWW sites, such as the *Light & Dust Anthology of Poetry,* centralized resources for both historical and contemporary visual poetry available in electronic form.[4]

Since the media and technology involved with producing these works involve kinetic elements, or moving parts, digital poetry of this type is an entirely new idiom of poetic expression. Though poets have often worked to incite movement and transformation through active, refined speech, it was not mechanically possible to sequence words before the twentieth century. We must turn to other genres to find ancestors for this type of work.

Artists who practiced in earlier movements such as Dadaism, surrealism, futurism, and constructivism experimented in the idiom of film, often, as Jack Burnham writes in "Art and Technology," to engage in a "systematic subversion of the machine as an artistic force" (232). Although these films make use of similar techniques that have been taken up by digital poets—particularly montage, the use of symbolic information, and the relation of one picture to another—the films produced during these periods almost exclusively favor moving images, or (human) characters physically and linguistically interacting with each other, rather than the visual reinscription of words. In some of the silent movies made by Vladimir Mayakovsky (e.g., *The Lady and the Hooligan,* 1918), the narrative is propelled by written passages that explain transitions, but otherwise the written word, superimposed onto film, is absent. A passage that appears in Ingmar Bergman's introduction to a collection of his screenplays ("Film Has Nothing to Do with Literature") offers some explanation of the differences between media (writing and film) that may have directed artists away from expecting audiences to "read" films:

> Film has nothing to do with literature; the character and substance of the two art forms are usually in conflict. This probably has something to do with the receptive process of the mind. The written word is read and assimilated by a conscious act of the will in alliance with the intellect; little by little it affects the imagination and the emotions. The process is different with a motion picture. When we experience a film, we consciously prime ourselves for illusion. Putting aside will and intellect, we make way for it in our imagination. (145)

Bergman provides a useful point of reference in terms of qualifying the task taken up by digital poets. The challenge confronted by authors involved with new media, who privilege the appearance of language rather than the development of characters and fictitious plot, is precisely that they do require audiences to read while otherwise having a cinematic experience. This predisposition toward the literal manifestation of languages is both direct and illusory, creating a confusion and modifying what we mean by "reading" and "viewing" narrative. Digital poems, in contrast to films, are thus a combination of forms that demand viewers react to text and immediately engage with it on an intellectual (rather than purely imaginative) level.

In the 1970s the visual materialization of language began to assert itself as a force in film, first as a spoken component and then as a visual one. The poet James Broughton, described by P. Adams Sitney in *Visionary Film* as the "undisputed master of the fusion of spoken poetry with images," made numerous short films (e.g., "Testament" [1974] and "Song of the Godbody" [1977]) in which his poems serve as accompanying narrative (436). Titles produced by George Landow and Hollis Frampton in the 1970s are among the first examples—since the silent film era—of "written" language itself becoming a profound element in film. These developments, in Sitney's view, represent the metamorphosis of "structural" film into "a participatory form which addressed itself to the decision-making and logical faculties of the viewer" (392). Landow—who later became a renowned hypertext theorist—produced *Remedial Reading Comprehension* (1971), which took form as "a film of short phrases in an ambiguously didactic sequence" (393). In this work the text of a found object (a speed-reading training film) is juxtaposed with contrived images and at points directly addresses the viewer (e.g., "This is a film about you") (393). Alternation of visual and verbal signs is also prominent in Frampton's *Zorns Lemma* (1970), although Frampton's film, by manipulating language on the level of the letter, advances the ac-

tivity to another level of complexity. *Zorns Lemma* begins with "a long series of silent shots, each one second of photographed signs edited to form one complete Latin alphabet"; a second type of ordering occurs in which "letters begin to drop out of the alphabet and their one-second pulse is replaced by an image without a sign" (394). Drawing viewers into the text, Frampton makes it a participatory experience because he "sets in action a guessing game and a timing device"; the method of alphabetic-pictographic substitution lures the audience in and challenges them to figure out if patterns are established (and if so, what they signify) (394). These works amplify reading by the superimposition of images. To encounter the appearance of text beyond that which appeared in a film's credits was unusual at the time, although now it is almost expected in filmic digital poems. Sitney observes that the works of Landow and Frampton "come about from an elaborate preconception of its form" (397); the artists had developed an advanced understanding of how the machinery could be used, which results in an expansion of a viewer's experience and encounter with the chosen texts. Possibilities inherent within the task at hand are clearly being reconsidered at this stage in the history of avant-garde film, and it is at this point that film most closely forecasts methods that digital poets would later explore.[5]

As David Antin observes in his essay "Video: The Distinctive Features of the Medium," videotape technology was developed in 1956 (153). Thus, the advent of avant-garde video must be acknowledged as also playing a role in the development of activated poetry, even if language was not always pronounced or set into motion as it would be later. John Baldessari's *Some Words I Mispronounce* (1971), which prominently features the presentation of language (this video is entirely composed of the artist writing a series of six words on a chalkboard), is just one example of a video that privileges language or allows its appearance to play a primary role. Numerous artists experimented with poetry and video. Philippe Bootz's essay "Poetic Machinations" mentions (but does not discuss) three videopoems that were produced in France between 1982 and 1985: *Deux mots* (Roger Laufer/Michel Bret, 1982), *Sécuritexte* (1980), and *Métro-police* (1985) by Paul Nagy, as well as Frédéric Develay's videogram "Lieu provisoire état du texte" (1985). Marc Adrian worked with video technology, as did Clemente Padín (e.g., "Aire," 1989). Video and poetry were combined by Vito Acconci, Tony Oursler, Joan Jonas, Gary Hill, Nam June Paik, and many others during the 1980s and 1990s. Richard Kostelanetz paid extensive attention to the form, producing

several videopoetry projects, including *Partitions* (1981), *Kinetic Writings* (1989), *Stringtwo,* and *Onomatopoeia* (1990).[6] Caterina Davinio's *Tecnopoesia e realtà virtuali* is the most useful catalog of videopoetry. Davinio, whose background is in electronic and video art rather than literature, documents and provides brief descriptions for works of nearly fifty artists whose videos foreground verbal elements. Many of the diagrams in her book show superimposition of text over video and signal processing (multidimensional distortion of image), which are the foremost elements enabled by the technology of the era. Several of the artists introduced by Davinio use work by established poets in their videopoems (e.g., Giorgio Longo interpolates poems by Fernando Pessoa, John Donne, Dylan Thomas, and others). The major difference between early avant-garde videos and most kinetic forms of digital poetry is the absence of what Rosalind Krauss has called the "aesthetics of narcissism" in digital works (Hanhardt 179). Whereas the vast majority of videos feature the artist as a subject, this trait—the image of the artist—is infrequently found in kinetic poems.

Technological Conditions

Software is the most integral computer element employed in the production of static visual poems. Visual works, though not yet common, began to appear after the invention of Computer Aided Design (CAD) technology in the early 1960s, although other (nongraphical) programs were used first. Other technological developments during the 1960s germane to the production of graphical works (although not commercially available at the time) included graphics systems like Sketchpad (1962), which allowed the user to "draw" (with a light-pen) on the screen. The most profound growth in the advancement of visual poems did not occur until the PC era of the 1980s and 1990s, when many GUI software programs were developed, such as Macintosh Paint (1980s) and Corel Draw and Adobe Photoshop (1990s).

Printed output has been possible since the development of dot matrix printers in 1957. Thermal printers (1966), digital typesetting (1968), laser printing (1980), and color laser printing (1988) all played a role in heightening the quality and aesthetics of visual works. Computers used cathode-ray tubes for display during the 1960s, 1970s, and 1980s, although not all computers made use of screens until the PC era. By 1958, Ted Nelson explains in *Computer Lib/Dream Machines,* color screens were available, although display terminals that could handle halftone colors and videographic informa-

tion cost $500,000 well into the 1970s (21, 32). "Keyscope" displays capable of conveying text were widely available at that time, and more versatile color screens, some capable of handling vector graphics, were also in production for less cost; systems designers cobbled together "Graphics Habitats" for localized use (41). In general, screens improved qualitatively (liquid crystal display instead of ray tube), as well as quantitatively (i.e., they became larger), although it is worth bearing in mind that with screens "the main thing to understand" is, as Nelson writes in *Computer Lib/Dream Machines,* "what they do is decided by human beings, not 'scientific principles' " (13).

As with static works, the development of animation software led to an increase in the quality and quantity of works produced, although the first animations (circa early and mid-1980s) were made with code languages like FORTRAN and Visual BASIC. Animation was possible by the early 1970s, and by the middle of that decade Lillian Schwartz and Ken Knowlton had begun to use a computer-controlled monitor and film with an animation camera to make "computer movies" with their collaboratively written EXPLOR language.[7] By the mid-1980s the development of the Minitel "videotext" system began to bring static and animated texts into homes via telephone lines, presaging later forms of network delivery like the Internet and WWW. At the same time (and into the 1990s), powerful multimedia scripting languages developed, specifically designed to integrate media like HyperCard and Macromedia Director, resulting in many dynamic works. Systems like the Commodore (CDTV), which integrated sound, imaging, and text processing components, were also developed; these had minimal impact on the genre proper but were a sure indication of future creative directions.

Typology

Graphical digital poems that do not inscribe hypertextual elements can be divided into two general categories: static and kinetic. Static works—or poems that do not move—are made from one of two distinct approaches: they are either shaped by an artist (presented to readers in print or in an exhibition setting) or built as viewer-activated work (viewed onscreen or printed out). Digitally rendered poems portray at least three different traits: words are arranged into literal shapes; words show patterns that represent dispersal or displacement of language; or words are combined with images (as in a collage). Viewer-activated (static) poems place words either randomly or

through preplotted designs that do not move on the screen (or require interactive manipulation but do not move on their own accord). In kinetic works optical mutation of words and letters is the operative principle; poems, by design, move and change before the viewer's eyes. Poems that inscribe kinetic language can also be divided into two general categories: projected and interactive. Projected works set poetry in motion in two distinct ways.[8] Words are plotted into motion (or letters themselves change shape or morph) or are presented as part of kinetic collages in which elements of language are combined with visual objects or symbols in single or multiple visual scenes/scenarios. In the few interactive works that are kinetic and do not involve overt hypertextual operations, viewers are invited to set some of the poem's parameters (used in the activation or appearance of words) or interact with a virtual object that is fixed in position on the screen (and may or may not inscribe words).

In both static and kinetic works mutation plays a primary role. In the first type letters are mutated into shapes either by manipulating the shape of the letter itself or by forming many letters or words into collective shapes. In works that request the same output each time, the only mutation is the transformation of computer language into visual language. In programs that do not request that every output of the poem be identical, the mutation happens from activation to activation—different activations of the program produce different results.

Static Works

The works developed at the outset, and at the end, of the historical period under investigation resulted from the program reacting to the viewer's activation of the poem. In the earliest poems a viewer would activate words or fragments output on the screen (randomly or through preplotted arrangements designed by the author); these poems did not move once generated. Later authors created poems, or poem-objects, that could be manipulated interactively on the screen but did not move on their own. In between these interactive poles, a number of static styles were also introduced. Authors created poems in which words formed literal shapes; poems that portrayed patterns, dispersal, or displacement of language; as well as collage works that combined language and image. My objective throughout the remainder of this chapter is to introduce and discuss examples of each

type of work in order to establish the basic foundations of visually oriented work based in computer operations.

Poems Re-active

Randomized and Plotted

Examples of graphical digital poems began to emerge in the late 1960s. Marc Adrian's "Computer Texts" (fig. 2.1) were featured in the Cybernetic Serendipity exhibition.[9] In this piece, documented in the exhibition catalog edited by Jasia Reichardt, the computer randomly assembles poems by using a database of eleven hundred alphabetic symbols to place twenty words at a time on the screen (53). Reviewing the output shown in the exhibition catalog, it appears that Adrian organized the interface using a grid system. The symbols retrieved from the database—which were letters or groupings of words—appear, at times in layers upon each other, in rows and columns on the screen.

Adrian partially disguises the grid element by varying the size of the font and not using every line or block. He adds a fluid aesthetic quality to the poem by diminishing rigid shaping via this technique. The rounded sans serif font also helps mask the *x* and *y* coordinates responsible for the symbols' arrangement, accentuating its visual properties. This example shows the piece to be verbally controlled, as only a single vowel, *o,* is used; this restriction does not impede the poem but rather imparts a design that reflects a particular technique and emphasis on both the language's appearance and sound. Furthermore, while some of the words are known (*cool, loco, old, do,* etc.), other combinations reveal the experimental essence of the poem (*colpo,* overlapped words). Neologism and graphical elements (overlapping words, smooth scattered lettering) were not new to poetry; futurist, constructivist, Dadaist, and concrete poets had already implemented such textual conditions without the benefit of computers. Yet Adrian's piece is important for several reasons. These "computer texts" are among the first examples of work presented with unconventional "syntax," permutation and aleatoric reordering of pieces of language by a computer, a technique profoundly exploited by Kenner, Cage, and others, in later years (see chapter 1). Fragments of words are combined by the programming and hardware to present abstract, artistic communication. Adrian uses the machinery to place and displace language and meaning; readers are thereby challenged to

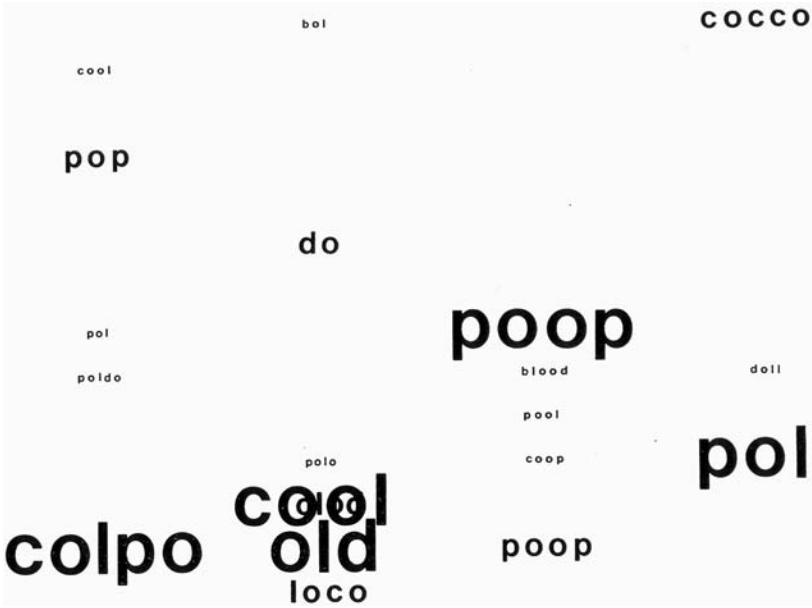

Fig. 2.1. Marc Adrian. Illustration from "Computer Texts," in Reichardt, *Cybernetic Serendipity: The Computer and the Arts* (London: Studio International, 1968), 53.

build an understanding of a text they have played a role in activating. A single example of the poem cannot amply illustrate the overall effect of the program. As the computer can perpetually reorganize the symbols, readers would normally see at least several screens; the poem would accumulate content along the way. The reader has the prerogative to walk away from the work at any time and would presumably do so when he or she is finished "reading" and thus co-composing.

This was not the only example of a filmic digital work structured with language made by Adrian in the 1960s. As he described in a 1970 interview, four different films that assimilate digital technology and language were gathered under the general title "FILMBLOCK" (1962–64):

> The films TEXT I and TEXT II are a mere permutation; TEXT I results from a memory program of a computer. The words were chosen by the challenge that they can be read in English and German alike with no change of meaning. GO is another theme of permutation. It shows clearly how meaning in the consciousness of the spectator gen-

> erates "by itself," based on a pure formalistic device. ORANGE, determined by a random generated scheme of free visual and verbal associations, is a montage that circulates round the idea and the picture of an orange.

In his 1963 film *Random* Adrian used a computer originally developed to record heart rates, which was connected to a cathode-ray terminal, to "write" directly onto the unexposed film material. His practice was extended, however, beyond a single idea or title. As Gerhard Rühm writes in "The Phenomenon of the 'Wiener Group' in the Vienna of the Fifties and Sixties," Adrian was instrumental in fostering a "methodical inventionism" that was developing at this time in Austria because "he referred to the usefulness of the fibonacci series for the permutative processing of the accidentally, intuitively or schematically created stock of words," an idea that everyone else involved with the group began to explore.[10] Adrian was one among several filmmakers who pursued the use of computer language and/or natural language and other mechanical fabrications that incorporated arbitrary functions and permutation algorithms, along with methods for the breakdown and sequential composition of images and text.[11]

Interactive Manipulation

In 1970 Carl Fernbach-Flarsheim created another unconventional poetry program, the Boolean Image/Conceptual Typewriter.[12] This interactive installation was loaded onto a computer with a built-in dynamic display called "The IDIIOM" (Information Displays, Inc.), which essentially became the "Conceptual Typewriter" that is shown in the exhibition's catalog, *SOFTWARE* (57). The output of the program presented alphanumeric information, though the letters and numbers were arranged as strings of text, or patterns, instead of being governed by rules of grammar and syntax. The "Boolean Image" is a "matrix" built on George Boole's idea that our causal reality is stabilized by making decisions (57). In this experiment those decisions involve presenting input, adding materials, or altering materials presented by the program. An example of this work included in the exhibition catalog shows that the output produced appears to stem from a central point (or a series of points) and radiate outward (fig. 2.2).

Because the program employs various sizes and formats of characters, a degree of depth and perspective gives the piece visual values in addition to literal and theoretical content. According to Fernbach-Flarsheim's notes,

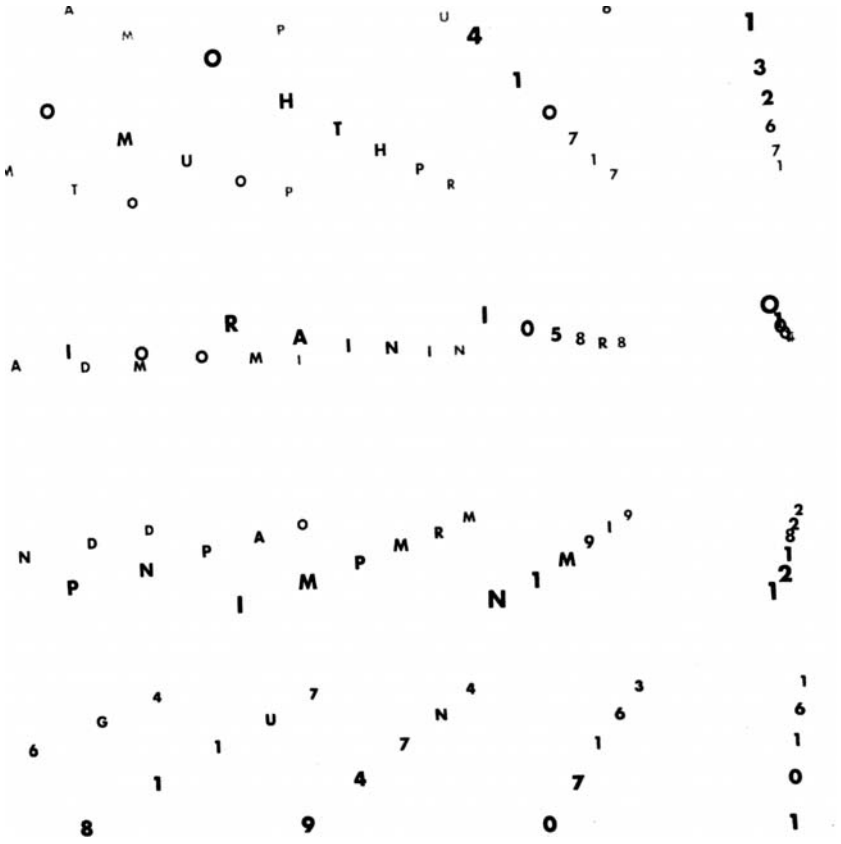

Fig. 2.2. Carl Fernbach-Flarsheim. The Boolean Image/Conceptual Typewriter. Detail of illustration in the *SOFTWARE* exhibition catalog (1970).

"Ten illuminated buttons on the [IDIIOM] control button-box represent ten concepts suggested by the *I Ching*. The viewer may add concepts or replace them with the buttons, or alter them with a light-pen" (57). The author's incorporation of concepts from the *I Ching* indicates the sense that random elements play a significant role in the piece, though since neither more details regarding the *I Ching* "concepts" nor more examples of output are presented, it cannot be determined exactly how the program performs. Fernbach-Flarsheim's note explains that the Conceptual Typewriter is "effectively table-driven from a scheduler (a virtual time-table), but packed into a curious list structure as well, for the handling of interactions and ani-

mations" (57). Clearly, rays of data were generated, but the amount of control that a user has over the initial output, as well as the relationship between the pieces of visual data in the presentation, is not clear. Both the output and purpose, while reasonably explained, are mysterious. The sample above shows letters and numbers that are seemingly randomly alternated (e.g., "1 U 7" and "7 N 4"), patterns in which only numbers are seen, and at one point a pattern of letters that is almost a word ("R A I N I N"). In this example the output data appear in units of six; whether "R A I N I N" was someone's replacement for randomized text is unknown (though presumably every variable could be customized). It is possible though unlikely that "R A I N I N" just happened to appear randomly; this particular replacement text thus would seem to acknowledge that the aesthetic produced by the Conceptual Typewriter at least partially resembles the design of Apollinaire's famous calligram, "Il pleut" ("It's Raining"), even though it largely eschews semantic content. The objective was to visually portray the idea that actions or decisions, writes Fernbach-Flarsheim, "occur in relational grouping or sets" that we have the ability to control, even though randomness is also a component of any situation; here "triggering devices" compose numbers and letters that invite (if not demand) a reaction and alteration from viewers (57).[13]

Poems Fixed in Space

Literal Shaping

Bailey's 1973 *Computer Poems* anthology, although consisting largely of standard text-based poetry, includes graphical poems from this era, such as Leslie Mezei's work (fig. 2.3). Bailey writes that in this type of "graphical" poem "concrete poetry is reflected with a computer mirror."[14] On a level of surface appearance this comment holds true, since a primary aspect of concrete works was to sculpt and project a visual poem. The strength of the connection between concrete poetry and this variety of graphical poetry is debatable and difficult to discern. Bailey's postulation, however, which is not supported by any other examples or commentary, proves to be at least superficially accurate (although it might be argued that concretism is a de facto influence on every subsequent visual poem).

Mezei's work employs a graphics program to combine the letters of the word *BABEL* into pictographic shape. The letters are not shaped into a tower but instead are twisted into a pretzel-like configuration. The letters

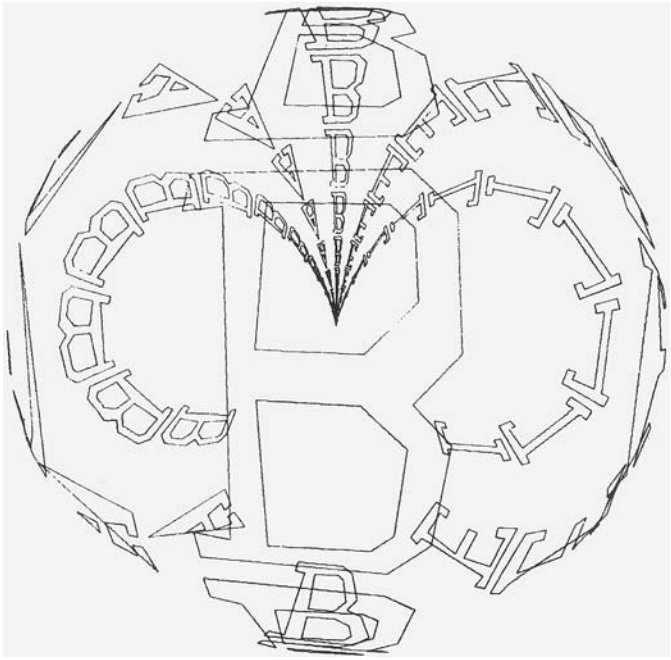

Fig. 2.3. Leslie Mezei. Untitled series. Illustration in Bailey, *Computer Poems* (Drummond Island, MI: Potagannissing, 1973), 36.

are manipulated both in size and proportion and appear to be spun around a configuration of curved lines, achieving a three-dimensional effect. The letters loop and curl in a circular pattern, feeding back into each other. The distortion and re-presentation of language has a startling effect—the piece could have been drawn by hand but would not show the textual uniformity of Mezei's piece (presumably the tool used to create this piece was a rudimentary CAD program). Significantly, the computer's graphical capabilities, using invisible subsurface grids, vectors, and other guidelines, clearly makes an impact on the composition of a poem that invokes contemplation yet only contains one word presented as fragments. A comparison to works presented in *An Anthology of Concrete Poetry* shows that concretists working a few years earlier, such as Edgard Braga ("Vocábulo," 1966), Henri Chopin ("La règle et les règles de ma femme," 1966), Ilse and Pierre Garnier ("Marie," 1965), and Maurizio Nannucci ("Nero," 1964), had all practiced

creating visual works employing a single word, and elements of that word, to shape a poem.

Noreen Greeno's "Wordworks," represented by two small pieces in *Computer Poems,* overtly adopts concrete aesthetics (texts in blocks) and other attributes, though the connection may be superficial, as the works are not graphically dynamic:

CANT RACE CORE ROPE CARE COAT
CART RATE COPE ROTE CAPE COLT
CONE ROLE CANE. (20)

The patterning is vertically oriented in both poems. The example above consists of a three-line grid of four-letter words. If approached conventionally (from left to right and top to bottom of the page), the poem is void of regular syntax. The main impulse is permutation, an effect that here obliterates standard grammatical principles. Words in each column are similar, as the third letter in each word on the top line is changed in each subsequent line. The shape and style of the poem emulates both Gysin's work (see chapter 1) and concrete poetry, though the content itself is not so self-referential or focused on the material purposes of the poem as are most concrete works. The second of Greeno's two pieces closely resembles one of the earliest concrete poems, Eugene Gomringer's "You blue . . . " (1953), in that the first word in each line of a short poem begins with the same word and is followed by just one other word (although Gomringer's work used different colored inks to pronounce and differentiate between the material aspects of the word). Concrete poems such as Haroldo de Campos's "Servidao de passagem," Gomringer's "Snow is . . . ," and other works also use this particular style of litany or cyclic technique. Greeno's poems feature repetition and permutation like many concrete and digital poems, and though these examples are not particularly expansive, they intone a rhythmic quality. Yet since the book provides no basis from which to understand the poem with regard to the programming methods in this piece, it is impossible to know what, besides the obvious intentions, was driving the composition. In "You blue . . . " the second word of each line was the name of a color, distinguishing between each "you." We do not know if Greeno's "Act alone . . . " is a fragment of a much larger work or how or why it was programmed. These facets make it difficult to understand the work beyond the surface.[15] As is, it

appears that a program orders a poem to be made as a set of vertical lists in which one letter of each word is randomly changed on each line.

Carole Spearin McCauley, author of the early critical study *Computers and Creativity* (1974), believed that computer-assisted literature was a method of extension for writing and created several graphical poems. Her first poem, discussed in *Computers and Creativity,* used APL to combine and recombine two lists of words and sentences (one each on sex and violence) so that poems appeared with specified line lengths and widths; she describes the process of the machine's inserting words and lines as resembling "a crochet pattern with varying row lengths and stitches" (121). The words generated in a "SEX" poem are programmed to vertically form the letters SEX; in the VIOLENCE series words are shaped into a gun firing bullets. These poems take on the shape of a particular object, as had works in *An Anthology of Concrete Poetry* such as Reinhard Döhl's Apple poem (1965), Jirí Kolár's poem for Brancusi, and Mary Ellen Solt's "Forsythia." Typically, however, concrete works embodied geometric shapes, as in Augusto de Campos's 1955 "Genesis" poem, in which placement of words creates four solid dots on the page, or Henri Chopin's "La règle et les règles de ma femme" (diamond shaped), as well as in multiple other compositions in anthologies of concrete poetry. Shapes invented by the concretists were in many cases more to provide a visual focus than to embody known shapes. This work, and others shown by McCauley, differs from the graphical approaches seen previously.[16] For instance, the shapes formed in Adrian's poems are accidental and unintentional, whereas McCauley, in the example described above, imposes a specific visual configuration.

Other artists who began to use a computer-facilitated neoconcretist style include Adele Aldridge (*Notpoems,* fig. 2.4) and Lillian Schwartz and Ken Knowlton in their cover for a book by Laurens Schwartz (fig. 2.5). Aldridge's piece is reminiscent of certain concrete poems in that it uses atypical and oversized lettering, but the connection here is closer in graphical philosophy to earlier approaches to shaped poems practiced by Apollinaire in some of his "Calligrammes" or Herbert in "Easter Wings," where the shaping of the poem is an embodiment of its content. Aldridge's mirror effects and distortions serve to exhibit the "play" (as in the exercise or amusement) indicated by the word, making a visual sign from a verbal signal, without much aesthetic interference. Apart from Döhl's "Apfel" and a few other examples, this approach was not especially common among the concretists, who tended to establish lexical keys in the form of graphical symbols and fragmentation

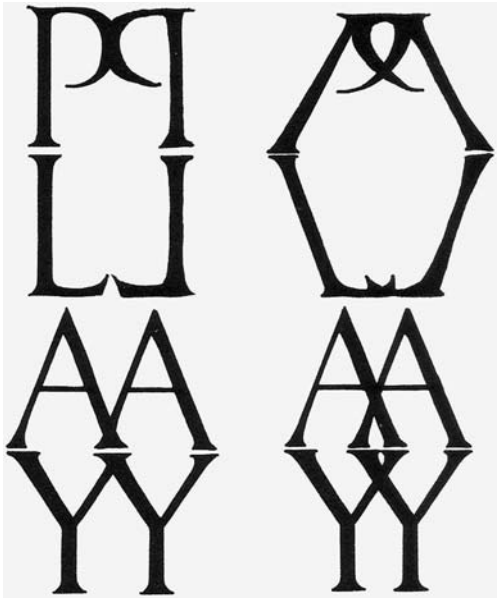

Fig. 2.4. Adele Aldridge. Illustration in McCauley, *Computers and Creativity* (New York: Praeger, 1974), 116.

rather than literally portray a word and its meaning. As previously mentioned, one of the theoretical and artistic objectives of concretism, stated by de Campos in the "Pilot Plan for Concrete Poetry," is the "tension of things-words in space-time" (Williams n.p.). Mentally, rather than visually, driven material that directly associates object and meaning does not foster the same level of "tension" in the reader as the more oblique communication of concretism. Distortion and manipulation of the words *play* and *BABEL,* as well as images such as McCauley's gun, and Schwartz and Knowlton's face (fig. 2.5), correlate image and content so that one is used either to diametrically explain or embody the other.

The distinction between calligraphic (literal) and ideogrammatic (symbolic) expression is illustrated in the variant presentations of language in these graphical poems. In the former, sight and thought work together to perform a one-to-one translation of the symbol; the process is in many ways direct and literal. When an image is embedded in the formatting of the language, as in the latter mode, the level of interpretation is at least doubled (i.e., symbols within symbols). The eye is more than a vehicle to deliver language to the brain; it is also responsible for determining a visual dynamic and defining its context. Computerizing text heightens an author's ability

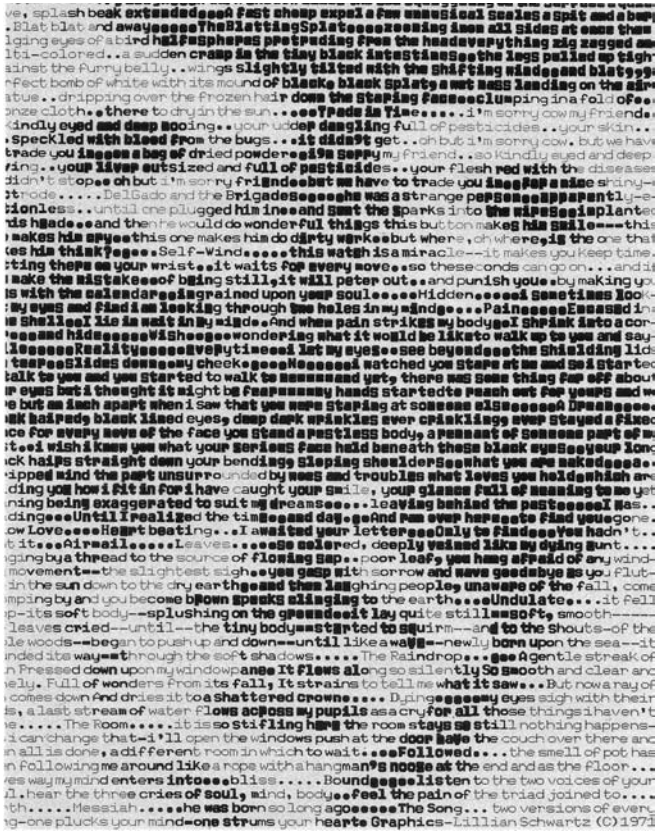

Fig. 2.5. Lillian F. Schwartz and Ken Knowlton. "Observances." © 1969 Lillian F. Schwartz. Courtesy of the Lillian Feldman Schwartz Collection, Ohio State University. Poems by Laurens R. Schwartz. © 1970–73 Laurens R. Schwartz. All rights reserved. Illustration in McCauley, *Computers and Creativity* (New York: Praeger, 1974), 61.

to manipulate and represent words as various kinds of images, thus suiting both approaches. Of course, translating calligraphic materials in a series (and words in any language) can be complicated, though typically the symbols are symbols that represent words, and the difficulty arises in composing a narrative. Ideogrammatic interpretation is typically more fragmentary and demanding. The face in the Schwartz and Knowlton piece that emerges through the mechanical alteration of the contrast of the letters exploits the advancements in graphical technology to extend the level of ideogram to

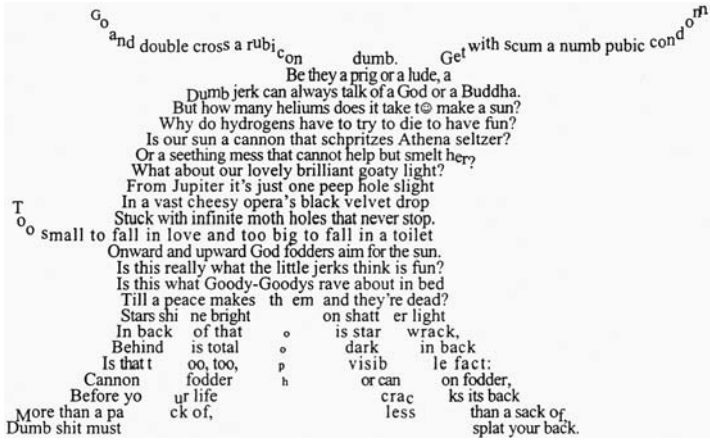

Fig. 2.6. David Daniels. "The Flying High Tail Longhorn Gate." Illustration in Daniels, *The Gates of Paradise* (Berkeley, CA: David Daniels, 2000), 25.

the realm of the pictographic.[17] Two significant layers of expression appear within the piece: the text of Laurens Schwartz's poetry appears in concert with his face and can be read as individual poems, or in portions, a method invited by the mode of presentation. Reading the embedded text is not as fluid an experience as reading it on a blank page without visual distraction. Readers are more likely to scan the compacted version, receiving the language in bits and pieces.

Text-based visual poet David Daniels, whose works did not become circulated in print until the publication of his mammoth volume *The Gates of Paradise* in 2000, began to produce his remarkable typographic visual poems using Microsoft Word in 1984. In these works Daniels uses software that allows him to precisely place and divide letters to represent the figures or subjects of the poem, which he states in an interview with Jorge Luiz Antonio and Regina Celia Pinto are "accurate images of what has taken over the inside of human beings." In the book each poem is a differently shaped "gate," as seen in figure 2.6.

Though he had been creating visual works since he was very young, Daniels divulged in the interview that the application of his ideas was not possible until he got a computer. As a means of addressing the context for his work, and establishing the centrality of software, he states: "Some people have tried to create shape poems with a typewriter. No one could

Fig 2.7. Erthos Albino de Souza. "Ninho de Metralhadoras." Illustration in Barbosa, *A ciberliteratura: Criação literária e computador* (Lisbon: Ediçoes Cosmos, 1996), 145.

write the shapes I write without a computer." The computer provides a set of tools that enables a pronounced and unique aesthetic, which, in their conversational play, bear little resemblance to works of concretism.[18] The gist of the poem is simply—yet with tedious technical precision—made literal by its visual component.

Dispersal of Language

Mallarmé's influence is strongest in poems that spread words and letters on the screen (or page), which can have the effect of presenting words as if they are in motion. Concrete poet Erthos Albino de Souza produced the first digital poetry in Brazil in 1972 by adapting a variation of FORTRAN that calculated industrial temperature distributions to produce visual poems. According to Arlindo Machado's *Máquina e imaginário: O desafio das poéticas tecnológicas* (Machine and Imaginary: The Challenge of Technological Poetics), Souza used the computer to literally monitor, assemble, and project letters (175).[19] A typical example, "Ninho de Metralhadoras" (1976), shown in figure 2.7, is presented as a series of computer printouts that clearly resemble concrete poetry, mirroring a sense of language shaped by heat (or lack thereof); Souza literally obtains the "informational temperature of the aesthetic text," a method proposed by Haroldo de Campos as one of the tasks of concretism in 1960 (Cirne 66).

The programmed density of random letters at the bottom (center) of the image indicates something packed together, a core of energy that explodes and dissipates. Even in this initial example, however, we begin to see elements that are *not* particularly concrete, such as the appearance of random text and the possibility of multiple iterations of the same text created by using different input data. Another digital, graphical poem by Souza, "Le

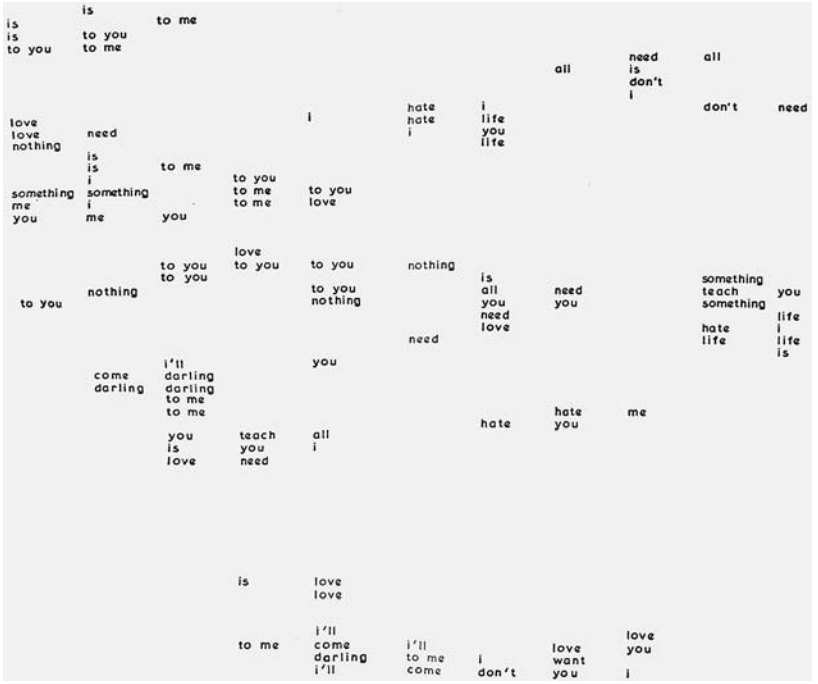

Fig. 2.8. Greta Monach. "Automatergon 72-1." Illustration in Bailey, *Computer Poems* (Drummond Island, MI: Potagannissing, 1973), 54–55.

tombeau de Mallarmé" (The Grave of Mallarmé), was a set of serialized visual poems that also explored this concept of textual temperature. "Erthos elaborated a program of distribution temperature," writes Machado, "and applied it to a fluid which when it is hot runs into a pipeline" (175). In this piece Souza codified the graphical scheme so that each "phase" of temperature corresponds to one of the letters in Mallarmé's name; according to Machado various graphical schemes and configurations were attained by heating the poetic "fluid" to different temperatures (175).

Greta Monach's "Automatergon 72-1" (fig. 2.8, as the poem appears across two pages of *Computer Poems*), resembles the constellational attributes of "Un coup de dés," and at the same time recalls works of concretism in its use of a grid to place short words in varied but spatially uniform conjunction. Text in each block is recycled within itself, again demonstrating the reverberating, permuted language in Greeno's work. Monach's poem can be read vertically and horizontally (row by row or column by column) or across

Fig. 2.9. Clemente Padín. "Stability" (1992). Illustration courtesy of the author. July 2004.

facing pages; the inscribed structure diversifies the possibilities for understanding and interpreting the poem.

The experience of—and perhaps meaning elicited from—the poem depends on the textual path that the reader follows, which will presumably shift as the program produces different versions of the poem. Monach's work, like Adrian's, has an echoic component. Short words are repeated, reconfigured, and placed in conjunction with each other at random. The columnar aspects of the work are more obvious with Monach, but the grid in this case serves to connect each word to others in multiple directions.

In the 1990s polyartist Clemente Padín, an accomplished and provocative visual poet (who established himself with the volume *Visual Poems, 1967–1970*), as well as a prolific mail artist and performer, began to use computer operations in his work.[20] Padín made his first digital works with the Corel Draw program in 1992. Though they were not kinetic, the graphical application implies activity on the page, as seen in figure 2.9, a version of the poem created in English.[21]

This piece is not aesthetically elaborate, but Padín manages to directly make a basic diagram of the postmodern condition of literature and exposes a material sense of artistic activity. The use of graphics here, as his use of video processing, is simple yet perfectly illustrative in black and white. In later works and communications Padín's use of computerized photocollage is elaborate. After creating a number of static pieces, he began

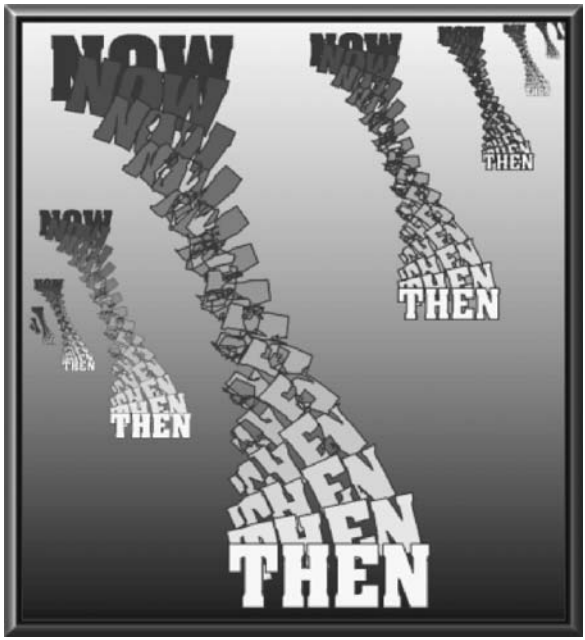

Fig. 2.10. Jim Andrews. "The Collected Sayings of Time." Illustration in *And Yet* (1992). Courtesy of the author.

to "move" his visual poems using video and was one of the first digital poets using Flash (1996); he has continued to practice both animated and static works since.

Jim Andrews, who now produces *Vispo* (a significant resource for visual poetry on the WWW), is a multimedia artist who began making digital poems at the same time as Padín.[22] Because he had access to "CorelDraw and Photoshop to make visual poems, and PageMaker and [Microsoft] Word for layout," Andrews was able to pioneer a new level of complexity in his visual works, which were first printed in *And Yet,* a literary arts publication he edited in 1990 (email 2005).

Poems like "The Collected Sayings of Time" (fig. 2.10) are slightly more stylized than the examples of PC-era works seen above and portray characteristics seen both in videopoems (e.g., E. M. de Melo e Castro and Kostelanetz's texts, which morph from one word into another) and in other kinetic works later produced, such as those by John Cayley, wherein phrases are transformed letter by letter from one language into another (e.g., "river-

Island"). The formation of words into shapes recalls concretist techniques, yet transforming letters by twisting them on the page rather then gradually replacing the letters with other letters or symbols—a technique enabled by the software—also signifies a fresh approach to the endeavor. This work most recalls Mezei's piece in *Computer Poems* (fig. 2.3) by using primitive digital technology to bend letters into a shape. In the first two decades of its existence, these formulations end up roughly in the same aesthetic condition in which they began. Computer poems projecting graphically stylized characteristics during the 1970s and 1980s largely shared aesthetic similarities, particularly the use of colors, typographic stylization, geometric and vector shaping, or otherwise formatting the placement of symbols and text. Instead of viewing these categories as a limitation, however, one can use them to ably chart the boundaries of this aspect of digital poetry both past and present.

Collage

With the availability of software that facilitated the incorporation of images in addition to manipulating language, collaged works—a form that also recalls Dadaist productions—became more common in the mid-1980s. Grumman cites Harry Polkinhorn as one of the first Americans to produce computer-based visual poems, in reference to Polkinhorn's 1986 collection *Bridges of Skin Money.* Polkinhorn used Macintosh software to make digital collages containing language and graphics. As shown in this example of a page from the book (fig. 2.11), they feature hand-drawn lines, geometric shapes, and distorted text that is impossible to read in a conventional way.

Small presses such as Xexoxial Endarchy, authors associated with Geof Huth's micropress, dbqp, and others working within a small-press network (offline, then online) became committed practitioners and promoters of digitally based work in the United States during the late 1980s.[23] Publications issued by these groups emphasized graphical elements in the form of symbolic and pictographic information, as well as in typographic experimentation. The computer undeniably facilitated such developments, a fact that is pronounced in a passage contained in the first chapter of Perloff's *Radical Artifice.* After referring to Richard Lanham's view that "electronic typography is both creator-controlled and reader-controlled," Perloff describes the ease with which she can now "use a wide variety of Greek and Roman styles, redesign the shapes of the letters, make them brighter or dimmer, alter the alphabetic-graphical ratio of conventional literacy, alter the 'normal' figure-ground relationships . . . illuminate the text in various ways,

Fig. 2.11. Harry Polkinhorn. Illustration in Polkinhorn, *Bridges of Skin Money* (La Farge, WI: Xexoxial Editions, 1986).

use different colors, reformat it in italics or capitals, and so on" (16). Although poets made elaborate visual works using typewriters and printing presses in the past, computers eased the manipulation of text.

Dynamic Works

Mutation (instead of permutation) is the operative principle in most dynamic works, as poems change in appearance before the viewer's eyes. Such poems are either projected onto (or at) the reader, or they are interactive. Projected works in the early era are usually linear animations or videos (produced to perform the same way every time) but could also contain random elements; some also contain interactive features. The most prevalent type of work involves words plotted into motion or letters themselves changing shape or appearance. Another type of work involves words or fragments of

language combined with visual objects or symbols (fixed or morphing), single or multiple visual scenes/scenarios (kinetic collage). In interactive works the viewer activates kinetic language/collage and is able to set some of the variables used in presentation or interacts with an object that moves in place.

Assessing the differences between printed and electronic text in his book *Of Two Minds: Hypertext Pedagogy and Poetics,* hypertext theorist Michael Joyce asserts that "print text stays itself, electronic text replaces itself" (236). This theory is fortified in works that many digital poets began to make during the 1980s. The earliest, somewhat generic, works advanced into a more complex, collagist realm in one of the earliest literary media publications, *Alire,* which was among the most significant developments in kinetic visual poetry.[24] In his book *Poética dos meios e arte high tech* (Media Poetics and High Tech Arts), Melo e Castro claims that such works propose "multiple inquiries" and enable both grammatical and expressive possibilities in the transformation of blank, neutral space into something enlivened by these potential attributes (64). Melo e Castro, in his practice and conception of videopoetry, does not refer to a form in which an image (or scene) is captured by a camera but one that is entirely produced or altered by computer hardware or software. Creating this and other types of kinetic work is a demanding activity that involves careful consideration and technological application, as well as working within the limitations of a computer interface. The endeavor of composing kinetic poetry is a creative act of the highest order.

Rather than employing random operations in their compositions, graphical elements that combine language and symbols produce a visual narrative. Works devised in the prehistoric era, despite their unconventional contents, were by definition as linear in form as books. Of course, what can be done with the medium itself, as a series of projected or displayed visual images, delivers a completely different type of reading experience. In later years, as interactive hypermedia programs such as Director and Flash were developed, some kinetic works became less linear and provided some authorial control or narrative options to the viewer.

Poems Projected

Words Sequenced in Motion

The most basic type of kinetic presentation involves words and letters plotted into motion. Several publications produced at the time, such as

bpNichol's *First Screening: Computer Poems* (1984) and *The Alchemist* (1984), are indicative of what transpired when poets began to use computer programs to produce kinetic poetry with prominent languages such as BASIC.[25] Despite their limitations and similarities, these poems represent the style of manipulated tactility that has come to define videopoems and that were subsequently extended by many works of digital poetry.

First Screening compiles ten poems that utilize capitalized block letters (except where noted), as did most early computer-generated poetry.[26] At the start of this title several *O*s revolve around another *O,* which, at the end of the introduction, is left alone on the screen. This brief display implies what will come in the title: many flickering letters put into motion and shaped into patterns before receding back into a blank screen. Eight of the ten poems, which run in succession, are fewer than thirty seconds in duration; if the viewer does not interrupt the program, the entire sequence can be viewed in about six minutes. The attributes found most commonly in this work are words that scroll (quickly, both horizontally and vertically) or appear to vibrate.

Nichol used several approaches to staging language in *First Screening.* In some works viewers encounter a transposition or interpretation of physical place on which the poetry is conducted. A graphical performance of activity is illustrated in this three-dimensional concept, using language as a visual descriptor as well as verbal data. For example, in "After the Storm" the simple statement of the poem gradually forms on successive lines, sometimes letter by letter, with words placed askew across the screen:

THIS
IS
THE
SENTENCE
THAT
THE
WIND
BLEW
HERE.

The space on the screen constructively represents a physical action. Letters come in from all directions to gradually form the readable text, often leaving a dissolving trail behind as they move; the word *blew,* once formed, also

vibrates on the screen.[27] The programmer has plotted the course of the visual activity, though it appears as spontaneous movement.

Repetitive, hypnotic traits are seen in other works by Nichol, in which words scroll quickly on the screen to activate an effect. In "Self-Reflexive No. 1" two phrases parallel to one another ("dream you lost" on the left and "toss all night" on the right) scroll up the screen in unison. In "Self-Reflexive No. 2" the phrase "the bottom line is where change is" scrolls down and fills the entire screen; as it continues to scroll, the only line that appears to be moving is the one at the bottom, flickering as it delivers the dual-message of the poem as a visual play on words, as well as a literal representation of the scene of the poem.

Another work by Nichol, "Letter," features the sliding horizontal permutation of seven words appearing on a line at the center of the screen. The poem begins, "sat down to write you this poem," then changes to, "down to write you this poem sat," and then reads, "to write you this poem sat down"; the poem cycles through every iteration of the phrase and ends, "poem sat down to write you this." This type of permutation is reminiscent of the works of Gysin, of whom Nichol would have been aware, and also emulates the shuffling characteristics of the poetic form known as "Proteus verse," which, according to Florian Cramer's essay "Combinatory Poetry and Literature in the Internet," was first labeled in 1561. The poem varies, however, from "I AM THAT I AM"—one line is shown at a time, and the words are reordered individually to achieve a Möbius strip–like effect. Nichol's design enables the piece to be both original and to hold particular meaning, instead of appearing as an overtly calculated experiment.

Nichol's work emphasizes the interplay between the words on the screen and how such play can establish meaning. The mingling of texts is crucial to making the statement of the poem, as illustrated in the second section of "Poem for My Father," where Nichol contrives yet another way for the action of words on the screen to embody the principles contained by the language. In this piece the words *train* (left) and *ghost* (right), positioned at the bottom of the screen, move in from each side, meet, and briefly melt in the middle, while crossing each others' path, and end up as "GHOSTTTTTTTTTTTTTTTTTTRAIN" on the bottom line.[28]

Nichol explored numerous ways of activating language. In "Any of Your Lip" (subtitled "A Silent Sound Poem for Sean O'Huigin") he uses stroboscopic effects: the word *Mouth* flickers at the center of the screen, alternating between upper- and lowercase. The lowercase text is then replaced by *myth,*

math, mate, Maze, and *amaze* (with *MOUTH* flashing in between each of these replacements). The sequence comes to a conclusion with the appearance of the words *ing, amaze, mouth,* programmed to read "amaze/ing/mouth," followed by several repetitions of the fragment *ing* (presumably to propel a sonic dimension).

The works presented in *First Screening* are often ingenious, while maintaining an appealing simplicity. Nichol's poems are lively, and they clearly influenced others who immediately followed.[29] His death in 1988 unfortunately prevented a second screening of computer poems plotted by Nichol from being developed; it would be interesting to see, hear, and experience what—if any—types of verbal-visual-vocal digital poems Nichol would be developing if he were alive.

During the 1980s a number of Brazilians—in part encouraged by the concretist model of passionately striving for innovation—were actively exploring the possibilities of kinetic poetry and inventing their own routines. Plaza's study *Processos criativos com os meios eletrônicos: Poéticas digitais* (Creative Processes with Electronic Media: Digital Poetics) documents several of these artistic works, which I will briefly introduce here. Alice Ruiz developed a simple, haikulike presentation, "acende apaga . . . apaga acende . . . vagalume" (lighting erasure / erasure of lighting / vaguelight), which, like Plaza's own videotext (also shown in *Processos criativos com os meios eletrônicos*), utilizes a basic interface (white text on dark background) to present in sequence the three brief verbal segments of the title in different locations on a line in the middle of the screen without graphical adornment (133).[30] The second segment in the piece is a linguistic inversion of the subject and object of the first. Kinetic qualities, easily enabled by the media and a simple program, accentuate the mechanical reversal of language in a slight yet clever manner to make a cause-and-effect statement devolve to a pronouncement of effect-and-cause, which is not resolved by the conclusion but made more indeterminate. Plaza suggests that the poem appears to be an analogy for the onset of night (132). The ambiguity of the language, however, also seems to momentarily suggest an uncertainty in the potential for language to be supported by light, given that an electricity-dependent computer terminal is the mode of presentation. Ruiz's "acende apaga . . . apaga acende . . . vagalume" is a revelatory, speculative poem that, despite its efficient production and delivery, holds multiple meanings. Whether it represents a view on the technology being used to present language is not as important as the fact that the viewer is presented language that mo-

mentarily projects ideas for her or him to contemplate. A different style of work is seen in another work featured in Plaza's study, Lenora de Barros's "Entes . . . Entes . . . " ("Beings . . . Beings . . . ," 1985). In this piece mirrored word forms are sequentially molded into different twenty-line patterns, becoming gradually compressed into blocks. At first, a minimalist ten-line poem appears twice: initially justified with the left margin and, on alternating lines, with the right margin. As the initially separate halves of the poem begin to merge, a type of activated concretism is enacted, causing the reader's perception to shift. The viewer is left to wonder what becomes of the poem—and why—as the line length compacts from eighteen characters to ten, then six, then two, leaving first fragments of words and then only syllables. The program squeezes the verbal information into a state beyond semantic recognition. The visual activity of the poem serves to enact the verbal content, as the poem in translation reads:

beings
are
between
crossing
and almost
near
hiding
kisses
that never
meet. (156)

The merging of the poem, which results in a breakdown of communication, digitally illustrates the sentiment expressed in the design of the program.

Plaza's study also chronicles Augusto de Campos's initial foray into digital writing, the 1982 realization of his 1955 poem "Pluvial . . . fluvial."[31] In de Campos's piece two six-line pairings of text derived from both words of the title are connected into a twelve-line belt of words and word fragments programmed to sweep horizontally across the screen and morph into different patterns and permutations of the root words. Plaza, in reviewing the piece, writes that the fluid movement of the programmed characters gives the sense of "creating two references: rain and river" (157). A movement is established that activates the natural conditions of the verbal and visual concept designated in the title, thereby representing a formation of elec-

tronic concretism, a pursuit that has been taken up (or otherwise responded to) by many artists since this early manifestation of such work.[32]

Eduardo Kac's earliest digital poem, "Não" (1982), presented on the *International Anthology of Digital Poetry* CD-ROM, was organized as a series of five blocks of text, each containing one nine-letter neologistic fragment: "OPOETAESS," "ECARASEMP," "REVAIDECA," "RACONTRAO," "CORODOSIM." The poem resembles a common LED screen (electronic lightboard), on which words consisting of red dots scroll from right to left in timed sequences, with a momentarily empty screen during the transition between words. Reflecting on this work, Kac explains in a "readme" file accompanying the work that "visual rhythm" is created that alternates "between appearance and disappearance of the fragmented verbal material, asking the reader to link them semantically as the letters go by." The poem combines programmed graphical cadence and the viewer's understanding—a cyborgian coupling. Another animated poem, "CAOS" (Chaos) (1985), was originally created using the French Minitel system, which enabled retrieval of data from remote locations via the telephone, and was meant to be read on public or private terminals or terminals installed in museums. Later recast as "Recaos" with the Macromedia Director software program, the poem is a brief, simple illustration of kinetic letters and the permutation of language through shifts in color; it is a rudimentary example of the type of work explored with great rigor by artists in this era. In his author's note Kac writes that his programming of the letter *c,* which is constantly in motion, intends to impart a "rhythmic behavior" and that the shaping of the letters represents both an hourglass ("slow passage of time") and an infinity symbol ("time beyond speed"); a second poetic implication of Kac's design involves the transformation of *c* into other letters to form words (e.g., "caos," "sos"), which leave "a mnemonic trace of other words, such as só (alone) and ossos (bones), in Portuguese." Kac, as so many digital poets before and since, manipulates the internal components of his poem to build new words from the old ones or to appear in fragments that the viewer uses to build a sense of meaning. Yet another animated poem, "Accident" (created with Director in 1994), shown on the *International Anthology of Digital Poetry,* engages a completely different approach; it is a ten-second loop (with soundtrack) that repeats until the viewer closes the program. Kac takes a passage of verse, which is converted from text into an image, with light-gray letters on black. During the loop, a graphical "punch" effect is applied to the image/text to make it appear to uncoil and recoil for the viewer; this static

text is put into motion as the soundtrack, comprising synthetic sounds, is also sonically manipulated:

> the words wont come out right.
> the words wont come out, right
> or w r
> on g
> t o n ight

The passage appears clearly, then distortedly, as if parts of it are inflated when processed. "Accident" is a statement about language on dual levels. If the "wont" is read as "won't" (the apostrophe is missing from Kac's text, though it appears in his commentary), the speaker of the first line in the poem cannot find a way to correctly express him- or herself; the next lines pronounce a more complex statement that could either mean that the voice is completely stifled or that what is voiced is neither right nor wrong (i.e., ambiguity instead of speechlessness). Given the computerized treatment of the work, one must also consider that the piece could be a statement about the open-ended permission one has in inventing digital poems (that a way of expression cannot be right or wrong in the new media environment). For Kac the movement, amplification, and distortion charge the text with emotions; he writes in a readme file that the fluctuations in the piece "suggest that antimonies based on language's precision or imprecision disappear in ecstatic encounters." "Accident" simply and effectively carries out this idea; the entire poem is made of a single brief loop and what the words transmit.

Kinetic Collage

Many poems present words or fragments of language combined with visual objects or symbols (fixed or morphing) as a kinetic collage featuring single or multiple visual scenes/scenarios. With a few exceptions content is fixed and linear; these are projected, noninteractive videographical digital poems.

Melo e Castro's 1969 videopoem *Roda Lume* (Wheel Light) is a two-minute, forty-three-second piece that is among the first to apply video technology to the presentation of poetry. The title indicates the role that "light" now plays in the production of text—that is, effusive light that comes from a projection bulb, cathode-ray tube, or another source. By using both empty space that fills with letters or lines, and shapes and letters that emerge in white from darkened backgrounds, Melo e Castro uses light (and dark) to

graphically create more than one scenario for the poem. In various writings on the subject Melo e Castro (who is Portuguese but has also lived in Brazil) names Stéphane Mallarmé as an inspiration; in *Poética dos meios e arte high tech* he celebrates the "substantive dynamism" that the French author had been able to achieve with a blank page (64), and his essay "Videopoetry" acknowledges "A Throw of the Dice Never Will Abolish Chance" for the concept of poetry as "a verbal galaxy of signs" (140). In video as a medium Melo e Castro saw an opportunity to test the dynamic possibilities for poetry, including the disappearance of language. Instead of working with tactile objects, such as wood, stone, and plastic, to produce visual poems, as he had previously done in his career, Melo e Castro recognized and pursued the idea that "the dematerialized virtual image was in itself a poetic image and therefore the poem could also be dematerialized" (144). In *Roda Lume* a combination of computer-animated letters and shapes propel an abstract narrative. The author's sketches, shown in *Antologia Efémera: 1950–2000* (2000), outline the sequencing of seventy different graphical schemes that were designed on storyboards; some examples of these sequences are shown in figure 2.12 and 2.13.

In "Videopoetry" Melo e Castro asserts that it is the duty of poets and poetry to challenge the limits of form and expression, break barriers, and offer new possibilities. The artistic approach, in *Roda Lume* and other works, involves the organization of a "metonymic" narrative in which substitutes or symbols are used to represent attributes of words instead of definitive language; Melo e Castro suggests that the character of images is more iconic than symbolic, meaning that in video words or concepts are demonstrated rather than directly stated (144). In contrast, panels in figure 2.13 show how letters presented on the screen are combined to form distinct words and portray a sense of movement among these elements (e.g., "rodalume"). Melo e Castro's "Videopoemography" states that the production for this initial work involved directly editing animation on the camera, "registering image after image with a time-based corrector," and adding a soundtrack that featured a phonetic reading of the images (145). Responses to the piece were negative, and the tape was destroyed by the television station that had aired it as part of a literary program (though Melo e Castro did manage to produce a second version in 1986).

Kinetic digital poems respond to the confrontation and possibility presented by new technology with which text and image could be produced. The technological value of the work is established by the text's ability to

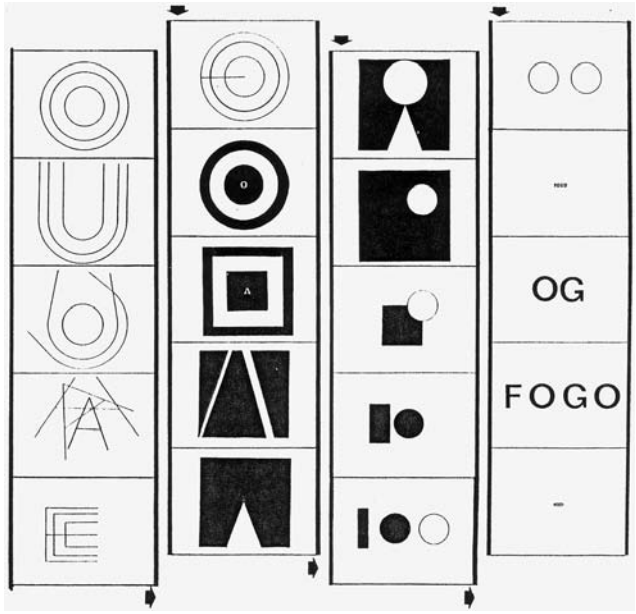

Fig. 2.12. E. M. Melo e Castro. Storyboard diagram for *Roda Lume.* Illustrated in Melo e Castro, *Antologia Efémera: 1950–2000* (Rio de Janeiro: Lacerda Ed., 2000), 283.

develop dynamics that surpass those of texts that feature simple repetitive and noncreative tasks. Melo e Castro refers to the experimental poetry of the 1960s ("iconized text," which would certainly include concrete poetry) as the most immediate reference point for videopoetry, though with new technical developments comes a renovated form of syntax in video, which is capable of sparking alternative and enjoyable textual presentations (142). Videopoems, with their "intimate relation of space and time, the rhythm of movement and the changing color," activate, writes Melo e Castro, a "poetics of transformation" with a grammar that integrates verbal and nonverbal signs (142). Sophisticated hardware allows the blending of alphabetic figures interlaced with links and moving images, which in some sense could be regarded as a type of activated constructivism as geometric symbols and shapings are so pronounced in the piece. The experience of reading in this kinetic textual environment is complicated and sensual. Borrowing and extending a phrase contained in the title of Marshall McLuhan's *Verbi-Voco-Visual Explorations,* Melo e Castro outlines the confluence of senses in electronic text: "On the whole," he writes, "a verbi-voco-sound-visual-

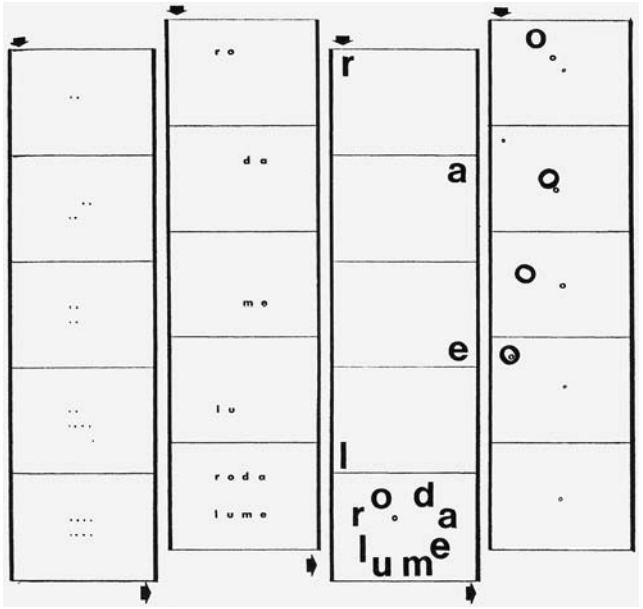

Fig. 2.13. E. M. Melo e Castro. *Roda Lume* diagrams. Illustrated in Melo e Castro, *Antologia Efémera: 1950–2000* (Rio de Janeiro: Lacerda Ed., 2000), 282.

color-movement complex and animated image is created calling for a total kinesthetic perception" (143).

In the mid-1980s Melo e Castro created eighteen videos in a series known as *Signagens;* seven of these works were eventually published on VHS tape under the title *Infopoemas: 1985–1989*. Each video features not only the movement of text, shape, and color but also theatrical type movements whereby the piece as a whole consists of a series of distinct scenes that employ different graphical treatments. Minimal amounts of text are combined with strategic use of color, pattern, and distortion to illustrate a larger point. For example, "Poética dos meios" (Poetics of Media, 1985) is a five-minute poem containing several different segments. In the narrative Melo e Castro indicates and illustrates some of the new dynamics of text, signified by the kinetic spelling of the phrase "formas voadoras" (flying forms), which is an apt description of Melo e Castro's work here, as are other phrases that appear in the video, such as "espaço elástico" (elastic space). In this video lines, dots, and circles appear and interact with each other to make kinetic patterns that revolve into visual chaos. A pulsating synthesizer soundtrack

plays throughout the work, a single repeated riff. In addition to establishing a visual continuity for the poem, the wavering shapes in "Poética dos meios" assert the lack of fixity that becomes not only a possibility but a probability of electronically presented poetry. This piece is an exercise that shows the capabilities of the technology and defines the parameters of videopoetry at the time. The poem demonstrates that an artist can manipulate any number of elements: character generators, shapes and symbols, colors, soundtracks, and so on. The poet's charge is to conceive of poetic ideas that the machine can effectively realize. Melo e Castro's work uses minimal verbal information in conjunction with visual patterning that establishes a correspondence between the two elements.

A shorter video, "Objectototem" (a neologism that combines the words *object* and *totem*) (1985), uses words constructed from the title, with a few added letters, to demonstrate the ways text can be instantly destroyed and reconstructed, thereby illustrating a process of how words are made. Short words (*teto* [ceiling or roof], *totem, acto* [act]) and repetitive fragments of words (*to, ta, a*) are patterned vertically on the screen (white on black); they accumulate and shift (offset with each other), and patches of words are shaded with color while rhythmic percussion and chanting of the words repeats on a soundtrack. An example of one segment of blocks of words that appears at the conclusion of the video:

TOTEM
TACTO
ACTO
ACTO.

This verbal sequence can be roughly translated:

TOTEM
TOUCH
ACT
ACT

The content is self-reflexive: the words shown are treated as totemic symbols, flexible by the nature of their construction, that can be (and are) purposefully manipulated in a series of actions contrived by the poet. From a literal perspective this declamation defines one series of roles or activities

for the writer who works with new media technology. The concern here, however, as in Melo e Castro's "Ideovídeo" (1987), is not necessarily to retain semantic value but to show how text can be constructed from bits of language, with an emphasis on the understanding of poetic concept through the process of viewing and absorbing active components of text in real time. The hypermediated effects in these works transform shapes into recognizable patterns in a series of shifts that represent new modes of expression. Melo e Castro plots a visually driven narrative that displays the malleability and flow of contemporary text. He illuminates how a combination of letters, symbols, and visual effects can be used to activate language, transmit imaginative ideas, and raise poetic questions.

Another of Melo e Castro's works, "Vibrações digitais dum protocubo perante seus espectadores" (Digital Vibrations with a Protocube in the Presence of Expectators, 1989), is devoid of verbal elements (besides its title). Poetic narrative is enabled by symbols, spiny skeletal geometric shapes—revealed as the interstitial line of a cube—presented in an aesthetic one might associate with black and white television. A flickering cube (skeletal, with only its edges defined) is the central figure of the poem. As the cube moves to different areas of the screen, the visual perspective of the cube slowly shifts to reveal a larger picture. Throughout the video, washes of color and other processes obstruct the images and ebb to reveal new views. The visual narrative presents both perfect and altered cubes in different dimensions. The central cube is reconstructed and duplicated on various parts of the screen; distorted, flashing cubes in motion compound the scene. This piece's continuous shifting of visual perspective, or display of multiple perspectives within a defined space, is significant, revealing a larger structure within which the materials subsist. Melo e Castro's effort here demonstrates that what we see—even in the confines of a monitor or terminal—can always be placed within a larger framework. Here the active framework is visual but also imaginative and conceptual. The viewer, without adjusting her or his vision, is presented with various scales of view within a single set of materials. Formally speaking, the poet shows that the image is not always what the viewer/reader expects it to be, nor is it always within the expected context. Subjects, ideas, and objects (the cube and its imperfect complement) are used instead of words to create a narrative that can be interpreted any number of ways, as in a poem. In one of his later collections of poetry, *Algorritmos* (1998), he entitles his introductory essay, "Uma poética do pixel" (Poetics of the Pixel) (7). Though technically Melo e Castro is not

composing with pixels at this juncture of his career, his works involve the inflation and transformation of pixels on a television screen. Melo e Castro has practiced this same idea—that every area of a given electronic "page," or page of a book, has dynamic capabilities—throughout his development as an artist.

Another documented example of this type is found in Silvestre Pestana's work of the early 1980s, discussed and described as an "Infopoem" in Melo e Castro's *Poética dos meios e arte high tech.*[33] In Povo-Ovo (People-Egg) (1981) Pestana created a program on a ZX81 machine that generated a series of abstract images using the words *POVO* and *OVO* in conjunction with black blocks. Melo e Castro's book shows the progression of five separate frames in sequence, as well as the coding for the poem (a genuine representation that was used to manufacture text), in a version prepared for the experimental poet Henri Chopin (fig. 2.14).

Presenting the poem and code together both documents the process and reflects the product of Pestana's work, which utilizes programming language to produce nonliteral images and recombinations of language and shapes. The first frame appears as a distinct but abstract shape constructed by stacking a combination of *POVO* followed by black blocks atop each other (and on one line the fragment *VO* appears); the second frame (read vertically) adds more *OVO* and *POVO* lines with blocks, and more fragments appear (94). Textual additions and deformations increase the amount of visual information presented through the next three frames. In the sequence of screenshots shown by Melo e Castro, the fourth and fifth "frames" appear to vertically blend into one another and double the size and shape of the image, whereas the three previous frames are discrete and, if anything, appear as a cumulative mutation of symbol and text. The work's status as printed documentation does not serve it well, as shifting sequences and motion were a feature of the original conditions of the text. In actuality, the frames shown by Melo e Castro replace one another, as demonstrated in a representation of the piece included on Kac's *International Anthology of Digital Poetry.* Kac recreates Povo-Ovo as a QuickTime movie based on stills reproduced from a collection coedited by Pestana entitled *Poemografias.*[34] In the movie, based on Kac's recollections of seeing the piece in 1987, a series of approximately six images are set in a loop on the screen; the images in Kac's version differ slightly in content but share the same style of visual representation. Both of these records show that the process of layering words and symbols, on the surface of a screen or page, is automated and crafted

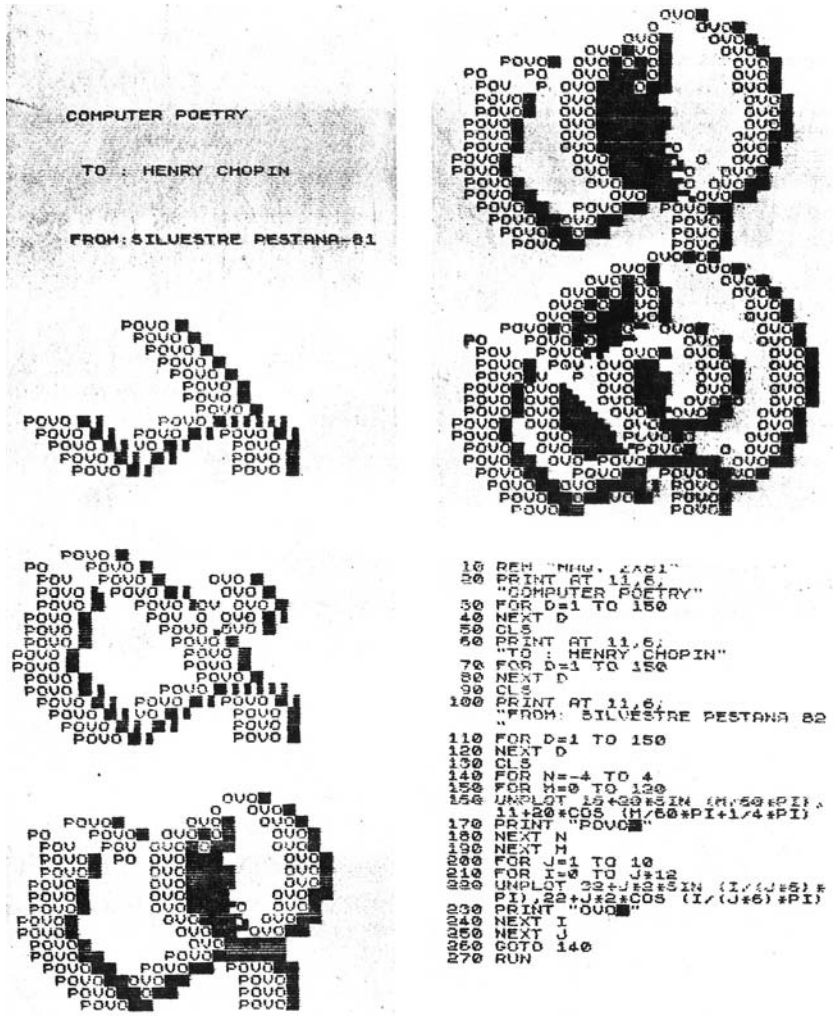

Fig. 2.14. Silvestre Pestana. Povo-Ovo. Illustration of output and program code in Melo e Castro, *Poetica dos meios e arte high tech* (Lisboa: Vega, 1988), 94.

via a computer program. An informal reading of the code suggests that the program specifies the placement of text on the page, sequencing two separate documents to appear on top of one another. The different iterations of the text demonstrate the multiple processes that inform Pestana's digital poem. Creating the code is a process involving writing commands to in-

struct the computer; the code in turn enacts the structural and presentational processes, which are also multiple but occur in a precisely plotted sequence.

Geof Huth began to make collaged kinetic poems ("with occasional aural embellishments") in 1986; according to a posting on his weblog titled "Digital Poetry Incunabula," he first produced a series entitled "Endemic Battle Collage" (1986–87), which was noncommercially produced on 5.25-inch floppy diskette and designed to run in an unending loop on the computer screen unless the reader intervened. Of these works, Huth judges "Havoc," which was intended as "a visual experience equivalent to the aural experience of listening to one of Conlon Nancarrow's complex and colliding pieces of music for the piano roll," to have been the most successful. "Havoc" was programmed so that words filled the screen more quickly than the text could be read. The work first appears as a field of unformed alphabetic characters and symbols, atop which words (e.g., *horse, façade, cursory, after, havoc*) rapidly appear in a dense block without spaces, black lettering highlighted atop a white background. When the screen fills with words, color contrasts shift so that new words are white atop black; then words from both sections blend on the screen, and gradually sections within the block are removed to create a checkerboard pattern, which dissolves to end the pieces; then slowly fragments are removed altogether. The entire encounter transpires very quickly. The pace is intentional, precisely enabling the work to embody the quality pronounced by its title. In another of Huth's early digital works, "Things Moving Constantly against Electric Current," layered visual poems are viewed on a computer, presented as a looping slideshow.[35] Unlike "Havoc," the words are shown as seven static linear screens; one screen replaces another static screen, each of which is a frame, according to "Digital Poetry Incunabula," "in a movie that was but a single poem." Figure 2.15 shows one type of unconventional textual presentation.

As in Polkinhorn's static poem (fig. 2.11), a rudimentary appearance, with collaged shapes and pixilated fonts, characterizes the work, as was the case in many of the productions from the 1980s. In this example most of the text is inverted; this technique brings the "readable" words to the fore (*Instance* and *Rain*). The distorted words become a visual texture, and one can imagine that a poem—perhaps even a Möbius-style poem—could emerge from the fragments of readable words in a revolving series. Textual arrangement on each screen varies; one screen seems to be nonverbal but is actually a distorted (and nontypographic) representation of letters that say "Cray

Fig. 2.15. Geof Huth. "INSTANCENCE" (1987). Screenshot from *Things Moving Constantly against Electric Current.* Courtesy of the author.

on Joyce." The piece's last screen is telling of the author's intent: "Construction | reproduction | reconduction" appear in a column atop a colorful background.[36]

This type of steady, regenerative stream of letters and symbols largely characterizes the digital poems that were featured in *Alire* and were presented by means of the Autodesk Animator program (which activated scripts programmed in BASIC by the authors). Programming these works was technologically daunting, a process Bootz describes in an email as "a work of Titan," because "the letters are constructed in real time by the program."[37] From the project's outset, works presented in *Alire* show profound perception and intent: authors strive to fuse visual content with the meaning of the verbal, an enactment that, as Claude Maillard writes in his editorial of *Alire* 1, "elaborates and transposes the history of the letter." *Alire* contains mostly animated text, the appearance of which depends on the capabilities of the computer on which the texts are viewed. Authors use words, lines, phrases, and even fragments of words, which flash and move in various directions to form different verbal and visual patterns,

some of which are more versatile than others. Words appear in numerous visual scenarios that slide into place, rotate on an axis, and flicker on the screen while text, typography, and language shift in a range of font sizes and styles; vivid processing makes words in some of the sections vibrate wildly. The backgrounds, as well as some of the words, are frequently stroboscopic and aggressively impress messages onto the viewer. Active text is the motif throughout most work: words are replaced by large geometric shapes (ovals; circles; thick, angled lines) in motions that cover and uncover bits of language that relate to the poems' themes. Distortions and disruptions occur during, and become part of, the transmissions; words or phrases that are clearly readable become obscure, then become something else. In the shifting of fragments words are presented in such a way as to invoke contemplation by virtue of their suggestive powers.

Bootz's "Amour" (Love), labeled as an "evolutionary poem 1977/1988" and published in *Alire* 1, is a kinetic piece that, like many of the works presented in hypermedia, bears attributes from several different art forms: poetry, film, drama, and even—if one is willing to stretch its definition into an analogy—dance. The poem is formed by words reorganizing in and around a series of verbal structures in different phases. At first, words and fragments of a single line are presented: the first word that appears on the screen is replaced by another. The lines fill out, through various mutations, to read, "La mer hourdit son [. . .] sable" (The sea churns her [. . .] sands). In this movement of letters—which in content represent the pace and heaviness of love—words are formed granularly and in different colors, leading viewers to peruse the language presented in various locations on the screen and pursue other connections that can be made within the verbal and visual information. Similarly styled ever-changing lines appear as flashing text that stretches and slides horizontally, vertically, and diagonally atop shifting backgrounds of colored blocks on gray that surround the words and are altered by the movement of the language, as illustrated in figure 2.16.

Though impossible to capture in a still image, the animated and filmic qualities are impressive; "Amour" resembles a movie in that a verbal drama unfolds as the poem progresses. Words (in ASCII text) and block shapes in various plain colors are characters; the empty spaces on the screen create a shape through which viewers encounter a depiction of the mindscape of the content.[38] The kinetic language, that shifts both appearance and meaning in the poem, has been strikingly programmed in a way that is reminiscent

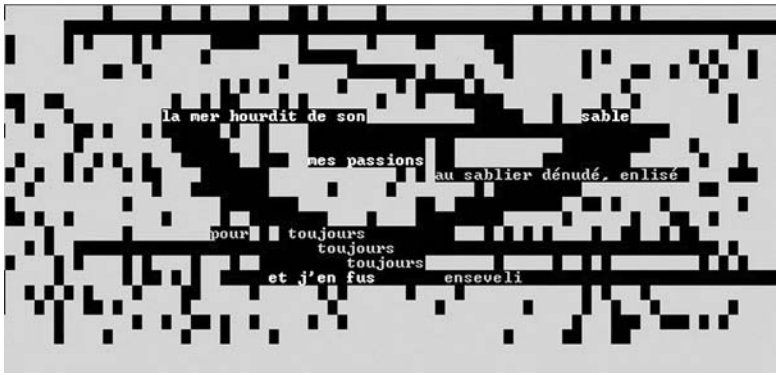

Fig. 2.16. Philippe Bootz. Screenshot from "Amour." Published in *Alire* 1; republished on *Alire 1989–1995*. CD-ROM. Villeneuve d'Ascq: Mots-Voir, 1995.

of the type of choreography associated with dance and with the movement of sand traveling across a windblown beach, which, as indicated in the bottom line seen in figure 2.16, always "entombs" the poet. The placement and use of the letters—as rudimentarily as they appear—is specific and elegant, something to be watched, enjoyed, and contemplated. The gravity of spirit reflected in Bootz's piece (the buried hourglass, etc.) is contradictory when compared to the lofty lyricism typical of romantic poetry, as is its mode of presentation.[39]

Jean Marie Dutey's "The Text-Eater," also published in *Alire* 1, uses a much more straightforward approach to design, even though it does present another sort of aesthetic challenge. A nine-by-eight-block grid is used to present eight pairs of words at a time; the words are also built on microgrids so as to appear to be made up of smaller blocks (fig. 2.17). The piece cycles through three different sets of texts, which are identical each time the program is run, and ends with a bright aqua-blue and pink image built using the same structure (pictographically, without language). In between each set of words, the text dissolves and then reforms. Distorted pixilated effects combine with harshly contrasting colors, making the words—in French and English—challenging to read.

The relationship between each pair of words and between each of the lines is unclear, yet the work reasonably performs as a blunt and abstract minimalist poem; the first example, typical of this lot, reads:

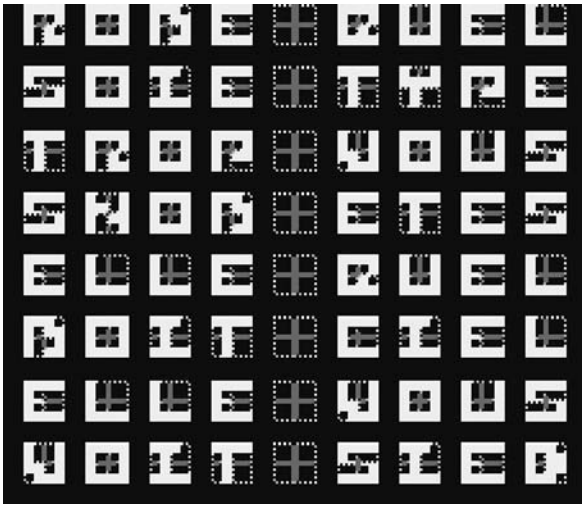

Fig. 2.17. Jean-Marie Dutey. Stills from "Le mange-texte [The Text Eater]." *Alire* 1.

robe what
silk type
too you
snob are
she what
drink sky
she you
see if you please

The bilingual, visually challenging, presentation and rapid dissolution and resolution of text present the viewer with an unconventional puzzle. Dutey's work is further evidence of how authors exploited distinctly electronic characteristics to warp language in projects that simultaneously explored and established new modes of reading; in the last section of this piece the words are replaced by bright but indistinct symbols. Reading in the new media environment can be difficult. Even viewers who had encountered stylistically variant visual and concrete poetry had difficulty with technological understanding, with aesthetics, and with learning to control the interface.[40]

The Little Magazine, vol. 21, CD-ROM (1995) is a less-sophisticated publication, whose projected aesthetics present a notable counterpoint to those

shown on *Alire.* This volume, which I coedited with Belle Gironda and Ben Henry, was the first digital multimedia literary journal to be produced in the United States. This collection included animated versions of poems that were first created for the printed page, although several hypertexts and sound poems are also presented.[41] In many ways the publication adapts the structural qualities of a print journal into an elementary hypermedia format in which the authors' voices can be heard, in addition to being read, and are complemented with graphical imagery. The software used to program the project, Asymetrix Multimedia Toolbook, requires that all the materials be set up on "pages," which are essentially advanced forms of HyperCard stacks. As is, the contents remain textually parallel to each other, connected not by interlinkage but by the viewer's selective readings through the material. Several artists contribute in multiple ways. For instance, Mark Chaney designed and programmed an index of thirteen Dadaist sound poems by Bill Luoma, contributed a screen saver he built, and created animations for Douglas Rothchild's short, fragmentary poems. Most of the pieces include integrated sound or video/animation and text and proceed to a terminal point. About one-fifth of the pieces on the magazine include nonlinear visual features, since Multimedia Toolbook easily enables randomizing effects. The visual counterparts to vocalizations by Trudy Morse (images by Don Archer), Lee Ann Brown (images by Lee Ann Brown), Katie Yates (images by Lisa Kaplan), H. D. Moe (images by Marty McCutcheon), and Purkinge (images from an unspecified source) are the strongest examples of spoken works being accompanied by graphical animation.

Works by Robert Grenier, by Lee Ann Brown, and by Joyce Hinnefeld and Jim Hauser, my collaboration with Nathaniel Tarn, and other pieces on the CD-ROM employ a "slide-show" approach. Grenier's work, because it has been presented in recent years as colorized Xerox copies, has confounded many editors. The pages are almost perfectly reproduced, however, in *The Little Magazine,* augmented by an edited narration of a slide presentation given by Grenier in 1994. In his review of the CD-ROM Eugene Garber comments that the "rapid changes of imagery" in Brown's post–New York School poetry are well served by the computer's ability to actualize the fire of the language of the poem (27). The movement of the language in the poem is materialized by randomizing the scripted images of the author's photographs of urban and rural landscapes. Geographically based writing by Hinnefeld and Tarn is accentuated by color images of the landscape presented in the written poetry. The appearance of *The Little Magazine*

represents an extension of what printed poetry publications were in the pretechnological era. At this juncture, as Bolter wrote in the first volume of *Writing Space: The Computer, Hypertext, and the History of Writing*, "Publishers are simply using the computer to enhance the older technology" (5). To a large degree the work appearing on *The Little Magazine* CD repurposes written forms to take on the appearance of emerging kinetic and multimedia works. Texts composed for the page are programmed to appear kinetically, becoming a sort of poetry video, wherein the poem is accompanied by computerized animation.

Poems Interactive

Setting Parameters

The most typical type of kinetic *interactive* works that did not employ hypertext in the prehistoric period enabled the viewer to set some of the aesthetic parameters of the work prior to activating the kinetic language or collages programmed by the author.

In Develay's "En toutes letters" (In All Letters [*Alire* 5]) this transaction appears with such subtlety, and so simply, that viewers may not even recognize what transpires.[42] One of the many interesting aspects of programmed work is that neither the viewer (especially one who is trying to access works more than a decade old) nor the programmer can be sure that a program is running the way it was initially intended to; this is but one of many reasons that the genre of digital poetry remains unsettled. Develay's piece shows the subtitle "La fatigue du papier" while a counter beside it quickly scrolls from one to one hundred. The viewer is presented with a screen where he or she is asked to make a choice: "Before this work is set up you are in a situation: of collecting or of co-reading?" Seemingly, it is an interactive text to which the viewer replies by typing either an *a* or *z*. However, the next screen always appears in the same formatting: showing the information about the piece (author, title, year, etc.), and, if the viewer has chosen *a,* "coproduction" appears in the last line of information; if the viewer chooses *z,* "co-editing" appears. In either case the viewer is then directed to type his or her name (less than seventeen characters) and then press the enter key. After this occurs, the phrase "installation alire" appears in place of "coproduction" or "co-editing," and the piece closes. Beyond the minor shift in presentation, nothing else happens. Develay has programmed an essentially empty work that presents minimal interactive qualities; the same sequence of events oc-

curs no matter what variables are presented by the viewer. Rather than programming a poem per se, Develay has created a device or interactive installation to illustrate a point (as does Vallias's "IO" using different methods). Develay's piece, however, a game of a certain sort, is not to be read as an exposition on the weakness of digital poetry, the limitations of which are neither technical nor imaginative but, as shown in the abrupt ending here, can be impotent in terms of transporting the reader to another place. While the construction indicates that the reader can now participate in the creation of a common or collaborative text, Develay shows that such transformations do not always occur.

Only minor input is enabled in works found on *Alire.* One of the first works that allows viewers to give input, Bootz's "Voeux" (Wishes [*Alire* 2]) is an enigmatic piece that requires viewers to investigate the basic structure presented on the screen but only allows them to accomplish one of two tasks: to either erase characters that they have typed or to erase part of a phrase that the program presents. The piece begins with the words "that your hand will make sense" in white letters vibrating against a brightly colored screen. As soon as any key on the keyboard is touched, the phrase "being waiting for your action" appears three lines above the other phrase. The viewer can use the keyboard to type anything between the two lines and can use the spacebar and tab keys to move the cursor and erase "that your hand" from the original line, leaving "make sense" (which is fixed and cannot be removed, as is the upper line). The only other key that produces action is the enter key; when this is engaged, another line, "on this day," appears, followed by sequential numbers each time the key is pressed. No temporal component exists in this piece; "Voeux" ends either when the count of days reaches the number 365 or when the viewer presses the *q* key to quit. The viewer is not offered an abundance of content but experiences a confrontation with an interface that requires superficial action in order to proceed and to become completed.

Bootz's "Hymne à la femme et au hasard" (Hymn to the Woman and to Chance [*Alire* 7]) is a multilayered piece in which the viewer has some control over the ordering of the materials. The program also controls what the viewer sees by not making important components of the text available until other areas have been previously encountered, and it should be emphasized that, in fact, little viewer input is possible beyond selecting the sequence in which Bootz's kinetic stanzas appear. The initial interface informs the viewer that "the poem is starting with three matrices making a short poem

where the stanzas follow the mode of chosen reading"; certain letters in the phrase are filled in so that a second statement also emerges: "The art of the poem or of its readers." Two selections are available on the screen: to view the matrices of the poem on the screen or to print them. Selecting the first link, the viewer is brought to a screen that instructs him or her to establish an order of reading three words ("nothingness," "chance," "woman"). The viewer designates the order in which the words will appear by clicking on them with a large round cursor that is a ball made of hundreds of multicolored dots. After the selections are made, the program runs three different kinetic poems, each explicitly associated with one of the words. These presentations feature the same type of graphical processing seen in many previous works. Each segment is a vignette related to its topic (woman, nothingness, chance) that implies a blend of dream, fantasy, sex, and the inevitability of randomness and uncertainty. At the completion of this section viewers are invited to see the "sur-texte" (over-text), which activates an entirely different type of kinetic presentation (with minimal interactive attributes). A white screen serves as background for a large round cursor, which can be moved around the upper-left quadrant. Clicking anywhere in this area activates the language. A negative image of the screen is formed, below which four or five lines—taken from the texts viewed previously—begin to appear in various areas and in different colors. As in other pieces, new lines multiply and lead into new segments of dense imagery and language. No matter which part of the screen the viewer clicks at the beginning, the same type of processes applied to various (randomly) inserted texts are encountered. This is another example in which the author breaks a text apart and then provides the viewer a structure with which it can be variously reassembled. In his "Notes" on the piece, included on *Alire* 7, Bootz discusses this programmed writing as matrix poetry, which proposes to insert an exterior text (with its own dynamics) into the primary text. He discusses how informatics enables this and even makes programming through inscription seem normal. This notion of reading as not a simple taking possession of the text, but as a session of effective realization of text performed simultaneously by the reader, is a major aspect inherent in the writing of this work. The text written by the author is not, finally, the one read by the reader, who is required to invest effort before obtaining anything from the experience. Bootz proclaims his approach to the construction of text and reading as a literary, and not an informatic (computer), project because it does not necessarily need a computer. In the matrix, information

(verbal images) that is foreign (but may be familiar to the reader) is imported into the sur-texte, introducing information/imagery that contains similar themes or subjects different from those contained in the sur-texte. The reader has access to independent texts positioned in matrices, and the reading of the sur-texte is only possible after the reading of the matrix. In other words, the sur-texte is the part of the program from which variables within the matrix are derived.[43] Bootz discusses how programming technology was primitive when this piece was first realized and how he feels it is necessary to identify the base text used to form the output but not the modality (i.e., method) of processing the text. By importing an image from a given context, the reader absorbs multiple meanings or contexts in what Bootz refers to as a "dead memory" ("Notes").

Jacques Donguy's "Tag-Surfusion" (*Alire* 8) uses the program SuperCard (an advanced version of HyperCard) to create kinetic poems (in multiple languages, though mostly in English) that, when published in printed form in 1996, became "the first book of computer poetry in France," according to a biography posted at the Centre Internationale de Poésie Marseille. On activating the program, the viewer confronts a blank screen and a pull-down menu that contains four options: "to unfasten, or start," "slow," "medium," "fast." The first selection sets the piece in motion; the last three options allow the viewer to establish the speed at which the texts appear. In his essay on this work, "Tag-Surfusion: En 'traitment de texte' à l'ordinateur," also included in *Alire* 8, Donguy explains that the pace of the poem depends on the processing strength of the computer, that each segment will last less than a minute and "end on an object," and that it is "work made from blocks according to chance procedure beginning with predefined zones." Pictographic and other graphical images are absent from the poem, though the many words that appear do so kinetically, both vertically in columns on the left and right edges of the screen, and are arranged into shapes (word clusters) in a wider, central vertical column of the window. The program formats information with much attention to establishing graphical qualities, which appear in roughly the same manner each time the work is "unfastened." A fair description of the graphical texture of this work is challenging because so much visual activity occurs. Several groups of words (e.g., "computer," "bacteria," "Monica") or alphanumeric fragments (that resemble geographical coordinates or other such data), some appearing in larger typeface, begin to move at once, cascading in columns at the right and around the upper middle section of the screen. Several columns of text (for-

matted into phrases) flash at random on the screen, and verbal phrases multiply and disappear. Each time "Tag-Surfusion" is activated, the result is different; the same phrases, from which some of the single words are derived, reappear, though their verbal counterparts elsewhere on the screen always vary. Fragmented phrases remaining at the conclusion of the piece are essentially nonsensical and removed from any perceivable context other than randomness. Some examples of vertical texts that serve as end points to viewings include "Quark Strange Gemutlic," "Split Infinities Amok," and "Domestic Arrangement 2"; the corresponding horizontal remains associated with these viewings were "Karai," "Opening," and "Kings" (July 15, 2004). These samples portray disassociation, as do the juxtapositions seen in earlier points of the presentation. To view this work at a gradual pace heightens both its aesthetic qualities and overall reading experience. The title of the work, "Tag-Surfusion," along with the previously acknowledged instruction for the viewer to "unfasten" is literal and can be taken at face value here. Words and phrases of the piece are locked together in databases on various "stacks." When a viewer engages the program, words and arrangements of verbal texts are let loose in various, random patterns. "Tag-Surfusion" acknowledges the presence of coding (i.e., a "tag" is a symbol used by a programmer to denote an action to be taken by the program), and the fusion or synthesis that happens on (i.e., "sur") the outward appearance of the text.[44]

A few other poems that use minimal techniques for user input were also contrived in the 1980s. For instance, Richard M. O'Donnell (who believed that "each letter or word can quite literally become a performer and be visually exciting") created linear works such as "Electronic Creative Writing"—which appeared on a diskette publication titled *The Alchemist*—that enabled readers to change the speed of the text. Other works presented on *The Alchemist* allow the reader to establish the number of lines that appear on the screen but do not enable viewers to establish other parameters.

In the early 1990s Robert Kendall produced two kinetic visual works he called "SoftPoems," programmed with an IBM application called "Storyboard Live!" and run in DOS. These titles, "The Clue: A MiniMystery" (1991) and "It All Comes Down to _____" (1990), explore the dynamism of the screen and the nature of electronic poetic communication in modes similar to those found in *Alire*.[45] In a readme file that accompanied Kendall's work on the *International Anthology of Digital Poetry,* titled "Welcome to a New Dimension in Literature," SoftPoems are described as works of "inter-

active video poetry," meaning that the intent of the work is to perform as poetry that moves, with graphical effects (not made with a camera); neither piece contains audio components. Interactive elements are present, though somewhat minimally. "The Clue" very closely recalls the style of work presented in *Alire;* Kendall was exploring textual experimentation in a manner similar to Bootz, Dutey, and Maillard and Papp by using a hypermedia narrative that combines linear words and phrases in various fonts, sizes, and colors. Several passages appear that establish the work as visual and verbal pastiche and introduce the realm of subject matter, which in this example is a deliberation regarding what one sees and what one is shown. For instance, the first phrase that appears (as if sliding from an envelope) reads, "Reliable sources indicate that though events sometimes speak for themselves," and is immediately covered by the diagonally presented phrase, "they're better off keeping quiet." A statement, "Just what was the story doing there, anyway?" follows with a dialogue, each portion of which casts suspicion on "the story." At the conclusion of this sequence the viewer encounters a screen titled, "Digitdoubt: Digital Suspicion Generator," which is set up in a four-row-by-four-column grid. The viewer is prompted to press any key to proceed; when she or he does so, a cycle of words begins to appear (and disappear) one at a time within various cells of the grid, reading: "all / is / not / what / it / means." After the phrase passes through two cycles, the viewer may deactivate the device, which initiates a much longer animated segment that picks up the previous narrative; a dozen different kinetic verbal and visual vignettes continue to ruminate on reading, seeing, and believing. One example of a passage that is indicative of the continuing dialogue reads as follows ("//" indicates new screen):

But by the time
the tough-eyed
witnesses
were called in
//
to wrestle
appearance
to the front page
//
the site had been
completely seen

//
and the page had turned
//
nothing
to grab
hold of
anymore.

Kendall's piece is a playful, colorful projection that at the very least questions reliance on mass media for important information, so much so that he presents this cultural tendency as a mystery. The narrative here suggests that people must use their own eyes and sensibilities to determine what is real, even if it is not something one is used to (like reading on a computer screen).

For Kendall, working with the computer provides the opportunity to utilize a uniquely contemporary set of tools to amplify a poetic voice specific to the spirit of our times. "SoftPoetry" is, he writes in the readme file, "an update to the ancient traditions of the word as art object—the traditions of calligraphy, illuminated manuscripts, visual and pattern poetry." Kendall believed that his off-the-page works had pedagogical value, that "SoftPoetry" could be a "secret weapon for teachers." "By making serious poetry more tangible and just plain fun," Kendall writes, "it can serve as a great introduction for students. Again and again it has captured the imagination of young people and those who 'don't like poetry.'" While this possibility has not been widely explored, one cannot discount Kendall's viewpoint, idealism, or what his experience has proven.

Interaction with Virtual Objects

The other type of moving work required viewers to interact with a virtual object that moved in place on the screen.

In 1970 Alan Sondheim, using a program that reproduced three-dimensional graphics on a mainframe computer, began to explore the effects of 3-D graphics on language (his experimentation would be taken up by other practitioners of three-dimensional forms when the technology later became available). Sondheim's videotape "4320" documents (with video and audio) two users' experiences while they interacted with a graphical computer program (following a set of instructions to achieve specific configurations).[46] The program starts with an image of a projection of a hypercube into three-dimensional space, which is flattened by the (vector graphics) screen. By

turning the hypercube on its four dimensional axes, it could be made orthogonal to three-dimensional space, appearing as a projection of a wire-framed cube. Turning the cube orthogonally on the screen, the projection became a square. "By collapsing the square," Sondheim wrote in response to my follow-up questions to our interview, "a point was achieved" (email). The viewer's experience with a visual object appearing on a computer terminal is driven by sensorial perception, using an early joystick, rather than explicit language. As such, Sondheim's work here proposes a model for a digital poetics rather than presenting a digital poem per se; it is a conceptual piece involving an intuition of dimension rather than semantic translation. As illustrated, however, in both the video and in a pamphlet Sondheim produced in conjunction with the piece, working with the program leads intrinsically to dialogue by provoking mental and physical activity for the user. The process involved using vector graphics to output slices of a "hypercube" in two dimensions; in other words, objects conceived to appear in a multidimensional space were transferred into something a user could experience on a computer terminal. The title refers to the different spatial dimensions the author establishes within the program's parameters, as illustrated in an example of output presented in the pamphlet (fig. 2.18).[47]

When output is requested, and is presented as in figure 2.18, the multidimensional experience is greatly reduced and unfairly represents the piece. When a user was viewing the piece, she or he was able to manipulate the object in various ways and change its shape. The stimulating aspect of the work was interacting with the virtual object. Sondheim describes the experience of encountering the text/program as "learning to drive through hyperspace" (interview). The texts that accompany these images in the *Meta* pamphlet represent examples of dialogue, in the reflection thoughts and verbalized incidents shared by users of the program who articulate both the technical and visceral experience of the program. Sondheim notes that "feedback of a totally new sort" occurs: the "humanization of space" is a by-product of "learning a new perception" (b). The text that accompanies figure 2.18 contains a type of engineering drama—transcribed voices of users as they navigated and attempted to understand their actions—which resembles a multivoiced poem:

"Ok, drive that back into three space now.
Wait, it's still moving in four."
"I'm losing control, there's a bending—-"
"Try the lower console." (a)

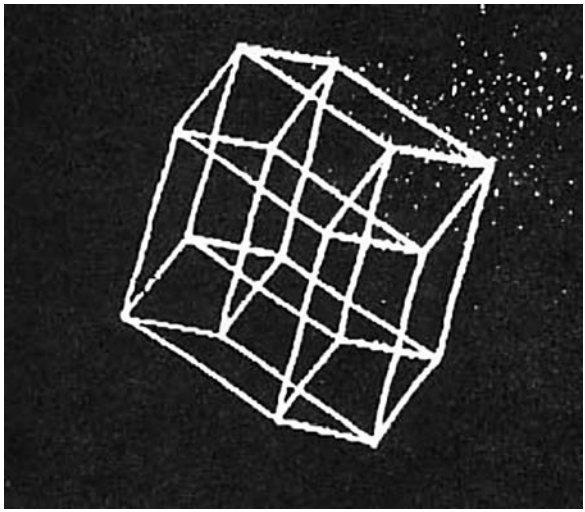

Fig. 2.18. Alan Sondheim. Illustration from "4320." *Meta* pamphlet (Providence, RI, 1971), a.

The text that accompanies another of *Meta*'s illustrations shows a more didactic type of instruction:

> "Now take it from there to the maximum
> extension—Petrie projection of the cube first.
> (Try for the hexagon.) Like driving lessons."
> "Just a second, how much have we got here . . . "
> "Wow, you're wildly fourspacing it. Lower console
> again."
> "Wait. ."
> "Ok, now shade i." (c)

The texts illustrate that though the piece is superficially devoid of language, the experience of working with the object invokes language as an intrinsic response. The active, cooperative perceptions of the user(s) generate one form of text or another. An internal dialogue occurs for users of any ability, which can be externalized, as in the records shown here. A new lexicon, largely related to the technology or technological experience, emerges from the exploration of an unknown object. The digital model becomes the

springboard for almost any type of writing, though as a visual device it does not emit language in any way. The "writing" here is about the experience of "reading" the piece, which is a possible exchange in communications in media of any sort. Yet other interpretations and manifestations are possible, as shown by the short story "His Angle," which is also included in the pamphlet. This piece of prose, also prompted by the program, is vastly different, as it describes a father's experience observing his son's study of history. The renderings that are instigated by "4320" are not as easily produced as texts automatically generated by a program; they are, rather, remarkably cyborgian efforts in which human-computer interaction is an inextricable aspect. Such an approach to working creatively with computers was unique at the time: most works were coded so as to produce programmatic texts rather than producing an immersive experience that could lead to verbal responses.

Jean-Marie Dutey's "Voies de faits" ("Ways of Making" [*Alire* 2]) groups short words or phrases (up to five characters limit) in a grid formation.[48] Instead of watching the piece proceed on its own, the viewer uses arrow keys to explore the larger grid made up of blocks of five lines of five characters each. When the piece opens, only two of twenty-five blocks of five-line text are seen, appearing as abstract lettering (modern-looking letters made out of smooth squares and rectangles). An image in the center represents an aerial view of a body of a figure inside the text, which moves its arms and legs in response to the arrow key commands. The viewer becomes this figure, looking down on the sets of words presented, as seen in figure 2.19.

The blocks of words present brief semantic statements, as in the examples "city / punished / scratched / from the / map" and "like / if the / future / was / banished." Viewing the piece through the legal orientation of the title, it is as if the figure on the screen is purposefully walking atop or away from these words. Dutey presents a map with which the viewer makes her or his own connections while traveling through the piece. If the starting place of the figure is considered as the upper-left-hand corner of the grid, then the viewer finds, directly at the center of this five-by-five grid a five-line block:

to live
to obey
to this
order
finally

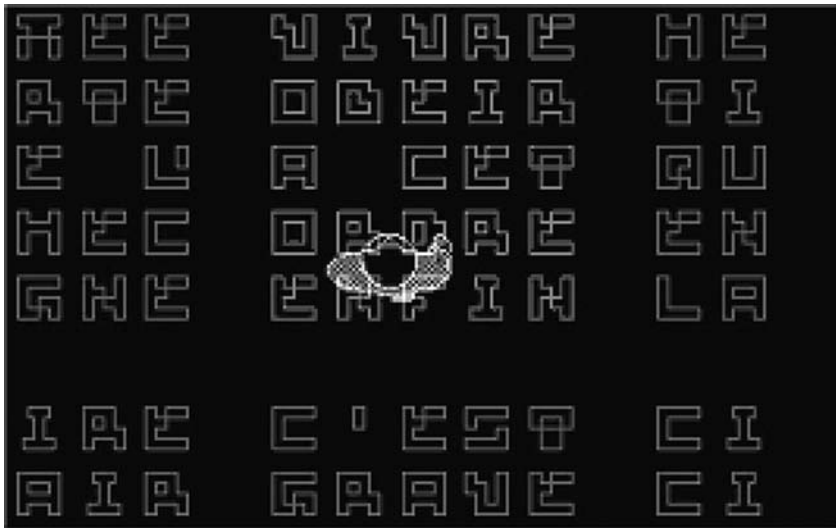

Fig. 2.19. Jean-Marie Dutey. Still from "Voies de faits." *Alire* 2.

This section of text is presented in a different color from the surrounding the texts, and the viewer cannot help but read this and also "walk" away from it. Until the entire interface is traversed, and every set of texts has been absorbed, the viewer continues to seek more content. "Voies de faits" displays a different proposal of interactivity from what was previously seen. Using a graphically based interface that is manually navigated, Dutey has made the consumption of words on a grid a more engaging activity.[49]

In the 1990s Brazilian André Vallias began to use animation and other techniques in his poems, a redirection indicative of the inclination to incorporate kinetic elements that had been gradually happening in several areas of digital poetry (e.g., in coded works, videopoems, and holography). As in static works he has produced (e.g., "Nous n'avons pas compris Descartes"; see appendix A), Vallias's early interactive works minimize the role of language altogether. His first piece, "IO" (1994), is an intriguing visual poem that first appears on the screen (accompanied by a pulsating electronic soundtrack) in high resolution as a rough, round, brown object with a hole that has smooth edges. Arrows in the cardinal directions provide a means to pivot the floating object around an axis in the virtual space; activating the arrows layers new sounds into the aural mix. Eventually the surface of the

stone becomes translucent, looking like an opaque orange balloon with a test tube stuck in it (see fig. 2.20 for model). As the circumference of the shape is explored, its lucid, realistic form is revealed. When the object gets to a certain position, the letters *I* and *O* emerge clearly as visual verbal data. Messages that appear in the margins of the poem include the phrase "Input/Output," indicating the idea of the primacy of cybernetic engagement in the digital poem. At first, "IO" looks like a picture, which becomes a visual poem with the user's sustained participation with the materials; it is activated, revealed, and explored by moving and clicking with the mouse on the arrows at the perimeter of the image. The internal and external structures that the artist has built to support the shape are both exhibited, as the viewer shifts between solid and transparent views. The other invisible aspect of this (and most) work(s) is the algorithmic/programmatic information; despite the "coded" information that is being presented, the computer code used to produce "IO" is completely absent from view. In manipulating the surface, viewers are given a sense of virtual tactility, and a transformation in form takes place with every movement. This dimension is not adequately emulated via static images (as here in figure 2.20 and alternatively represented on his WWW site).[50]

Vallias creates a poem that does not operate independently; it is a structure set up by the author for individuals to engage with, before and during any interpretive activity. As with many works in the area of text generation, the user's input ignites the output of the poem, albeit in completely different ways. The most obvious artistic forebear to this work, though it would have been unknown to Vallias at the time, is Alan Sondheim's 1971 video piece "4320," in which the viewer is presented with only an object to interact with and no language. Vallias continues to be among the leading designers of interactive, multimedia, symbolic poetry in hybrid forms, though numerous other artists have since profoundly styled visual language and imagery into interactive works (not always together).

"Continuous mutation," proclaims Vallias in "We Have Not Understood Descartes," "is perhaps the only constant distinguishing mark of digital media" (152). This statement can be read both as a commentary on the material values of digital poems and as a description of the artist's own creative trajectory. The challenging, shifting, ephemeral status of works in digital media are acknowledged, a process Vallias views as "a permanent process of making and remaking, of endless 'work in progress' " (152). Vallias, who be-

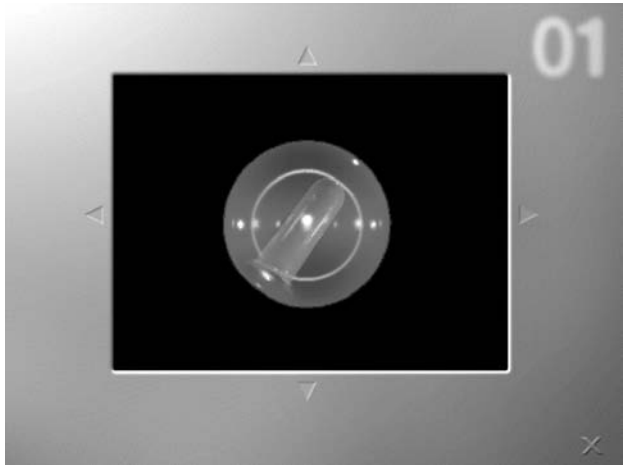

Fig. 2.20. André Vallias. Illustration from "IO." Screenshot courtesy of the author.

gan working with computers in 1988 to make three-dimensional art, has rarely used the same approach to composition for more than a single series of works.

Argentinian Fabio Doctorovich also picked up on this idea, producing "Chatgattcat (o rotaciones)" (Chatgattcat [or Rotations]) as an interactive poetic object in 1995. "Chattgattcat," included on the *International Anthology of Digital Poetry* as a QuickTime video demonstration, starts as a screen full of lines of rhyming verbal formations (e.g., "night tight bite byte / site kite light night yt") in yellow, green, and orange. While many of the words are in familiar English (e.g., "bogus hocus humus"), Spanish and neologisms are also present (e.g., "baratattac," "taluegomatracacaca"). The words are presented clearly, but the background has an undistinguishable visual texture. A close look shows that one set of words is set inside a frame made from an enlarged picture of the same set of words. That is, the active part of the screen is surrounded by a copy of itself, though only the top and bottom lines and a few letters at the left and right edges of the frame are readable. Words inside the frame darken so that only words in the center remain colored, becoming a three-dimensional sphere that rotates on its vertical and horizontal axes; words are visually distorted everywhere except in the middle, where they conform to the shape of the sphere. The fact that words share similar aural roots and can easily blend into each other is emphasized in the graphical presentation of the verbal script.[51] "Chatgattcat" is another

digital poem in which the viewer encounters a virtual structure with which to interact with intangible yet content-laden objects. While these works are not expansive, they are nonetheless compellingly expressive. They are graphical, and obviously begin to show kinetic qualities, though they do not move from place to place but rather, as in holographic works, move while in place. Their development indicates the beginning of new possibilities for the form, if not a trend, which was fortified by the development of software that capably enables the presentation of three-dimensional words and images.

Observations

In this chapter an array of visual poems (some animated, some not) share one common trait: portraying a sense of language in motion. Some poems take form as sculptural and fixed objects; others are literally moving. Digital poetry's emphasis on cultivating active language added overtly kinetic language to its canon of generated and graphical texts. Static works, such as Erthos Albino de Souza's poems, mutate from activation to activation but do not move in any given iteration. Andrews's poetry, also static, graphically mutates the letters so that a word morphs—before the viewer's eyes—into another word. In kinetic works poets find dozens of ways to portray poetic text as gradually shifting, vibrant verse. Palimpsest is used powerfully; images can be a mélange of fragments of words complemented or replaced by imagistic forms. These poems show that many different expressive elements can be plotted at once, or in a short period of time, layered on top of one another. Putting phrases in motion as sliding, spinning objects and otherwise synthesizing words, lines, and symbols are the techniques established as typical of all visual works.

The inclination to display poetic work in such ways developed alongside the technology capable of accomplishing the task. Directions taken by these pioneering artists became paths that have been followed by many others since, and they have only increased with the technical developments in the WWW era. Experiments by those who made activated or interactive works represent an important and fascinating step in the production of poetry. Using computers to make visually charged language and programming it to move were novel applications of technology that foreshadowed contemporary visual works.

These attributes would be expected from an idiom of digital poetry that inspired a publication entitled *Alire.* Though a neologism, built as a compound of the French verb *lire* (to read) and the (misrepresented) preposition *à* (to, at, in, into, on, by, for, from), the title clearly indicates that the presentations involve reading. These works require a heightened level of attention in the act of reading to contend with visual imagery and mutating textual elements, manipulating objects on unfamiliar surfaces using interfaces that activate language and visual poetry. In *Alire,* the first intensive display of concerted hypermedia (poetry) research, we witness the progress of several individual artists and serial works over a five-year period that immediately precedes the dawning of the WWW; the trajectory of the form at this time is divulged in this publication. The emphasis is clearly on kinetic and filmic treatments of language. Reviewing issues of *Alire* is akin to watching artists discover ways in which to process text on computer screens, practicing then projecting what they have learned to do. An absence of sonic elements is one of many puzzling surprises one finds in this particular multimedia environment, though Bootz's essay "Poetic Machinations" mentions that *Alire* includes an audio cassette for the sound texts (124). That no sonic material is included on the *Le salon de lecture électronique* CD-ROM, which is practically devoid of audio materials, is, according to Bootz, intentional; in a personal correspondence he writes, "Today, everybody knows how to read animation and attends sound in a multimedia archetype. In these years, it was not at all the case! Many people didn't know how to read the moving text! One said, 'I have seen everything but I couldn't read nothing.' Because the reading of moving text is not compatible with the reading of a book; there was always silence during the projections and people sometimes said 'chut' (silence) though there was not sound to hear!" (email). Nevertheless, this omission is glaring by contemporary standards. The soundless presentation of text was a conscious choice but cannot be considered a flaw, especially since it was a trait common to the practice of several prolific artists working in this period, namely Jim Rosenberg and John Cayley (who early in his career promoted the preservation of the act of silent reading; see chapter 3n36). In any case kinetic elements are the intensively promoted key focus of these works. Motion projected in the work leads to a type of excitement or energy in the poem, an enlivening that cannot be truly materialized on the page.

Dynamics apparent in these poems are portrayed in the styles of digital poems that have blossomed and gained recognition on the WWW, either in

static form or in forms comprising kinetic verbal and visual elements synthesized by software. Spectacular works made with Flash (or other programs) are in fact an extension and refinement of an approach to digital expression that had been previously, if remotely, intellectually and artistically explored. This is a fact that is not widely known. Yet the pieces reviewed above are solid proof that before the network existed, digital poets pursued concerted interests, as Eduardo Kac writes in his comments on his pieces "Storms" in *Alire* 8, "for the model of the network, for the readerly activity, and for giving up pretense of authorial control."

In the 1960s and early 1970s, digital poetry expanded from its formal conception as a programmed and automated process to involve visually structured and calculated work. Several authors who produced works proclaimed the influence of concrete poetry, and the lineage of concretism has remained a touchstone for artists and critics ever since. However, while Haroldo de Campos, in his essay "Ruptura dos generos na literature latinoamericana," described concrete poetry as a "critical mediation of forms" that "takes nourishment from this intermixing of 'media,'" concretism largely emphasized the graphical aspects of printed language and words (45–46). "Verbivoco-visual" techniques are deployed as a vehicle for static verbal configurations; while direct, the method often requires readers to take time and decipher the poetry (46). Décio Pignatari and Luiz Angelo Pinto's "semiotic poetry manifesto" of 1965, cited in *An Anthology of Concrete Poetry,* describes the necessity of forming signs that successfully determine the syntax in order to create "new communications possibilities" (n.p.). Texts had to be "dynamic . . . manageable, changeable, according to the needs of each text," and contain a conceptual synthesis of phonetic (verbal) and visual (nonverbal) elements (even though cinepoemic or logogrammatic elements are at the outset fixed in place). All of these concepts—verbal, vocal, and visual—are heightened and redefined in new media works. Not only do digital poems have the freedom to take on any imaginable form; they may be interactive and can change according to the needs of each user; they can be self-regulating or be regulated by participating viewers.

McCauley acknowledged in *Computers and Creativity,* as Bailey before her, that computerized graphical poetry "resembles, or perhaps grew from . . . 'concrete poetry'" (115). These initial connections by Bailey and McCauley (circa 1973 and 1974), associating digital poetry with concretism, acknowledge the challenging and expressive qualities of computerized work, and much has since been written of the historical connection between digital

poetry and concretism. Thirty years later, concrete poetry remains an obvious and hallowed precursor of digital poetry. At the 2003 E-Poetry Festival concretism was a steady touchstone invoked in many presentations and discussions.[52] Since multidimensional textuality is one of the major areas of exploration at present, this historical forebear seems logical when considering that the computer clearly enhances or extends possibilities inspired by concretist aesthetics.

The "Pilot Plan for Concrete Poetry," also cited in *An Anthology of Concrete Poetry,* asserts the "tension of things-words in space-time" as a major objective of form (n.p.). Furthermore, concrete poetry is qualified by Cesar Espinosa in *Corrosive Signs* as a "spatial-temporal structure, in place of merely temporal-linear development" (16).[53] Traditional (linear) and logically presented works that directly associate object and meaning foster less "tension" in a reader than materials presented with multiple components. This quality of concretism is complicated in new media works because digital conditions enable nonlinear, polymedia structures; virtual works can be logical or illogical, can shift quickly (or not), and can contain elements of chance. If the digital text contains algorithmic, mathematically and/or randomly designated variables, from which it can produce many different versions of the same text, how "concrete" can it be? Further degrees of uncertainty and difficulty arise because digital poems not only have a surface but an interface, often with transparent depths to explore; a viewer usually has to learn how to interact with digital works and discern their boundaries. Without any instruction or experience such reading conditions can create immense challenge and trepidation.

Another noteworthy aspect of the graphical poems explored here is that they largely deemphasize the element of randomness. Artists continue to work in collaboration with hardware, programming, and software but have generally retaken compositional control over the output. In some senses this mode of static presentation represents a reversion to typical artistic practice, where a work is prepared for presentation in advance rather than generated instantaneously with randomized elements at its consumer's request. Instead of the painter using a brush, or the poet operating within the powerful yet contained conditions of a typewriter, advanced graphical tools enable digital renderings of language. The digital productions by Adrian, Schwartz and Knowlton, Kac, or Vallias, artists who are working with the poem as a visual object, do not resemble works previously seen anywhere, but in other respects most computerized works serve to recondition historical forms of

visual poetry. At the same time, another technology was being developed that enabled words and letters to be put into motion. The tendency toward retaining authorial direction of expression continued to formally develop as these kinetic graphical works were gradually conceived and constructed during subsequent years, including videopoems.

In the visually oriented works of digital poetry reviewed above, technology intended for the creation of graphical artwork is used to process language instead of images or language as images. The style of text used by Schwartz and Knowlton (using characters and symbols with various degrees of shading when printed onto paper) had been developed by Knowlton and others in a corporate environment and was then appropriated to serve poetic purposes, giving what is already textured language further texture through the presentation and layering of visual information. Nonetheless, despite the drastic variations in approach to composition, each reasonably coexists within the scope of digital poetry (which, somewhat ironically, has never achieved commercial success despite the corporate roots of its tools). While certain approaches, such as holopoetry (see appendix B), can be seen as flexible (multiperspectival) texts, the programs are typically devised to repeatedly produce the same text unless the input variables are changed (in which case different versions of the poems—alternative displays of the information—become possible). For many years writers and artists have used computers, software, and fonts to do more than make shapes on the page. Graphical poems as such are not new to literature, though the tools for producing them alter, accelerate, amplify, and, ultimately, animate the process. Contributing to a trend that fosters changes in the act of reading, an increase of poetry containing graphical elements has intensified in recent years because both the software and publishing medium of the WWW enables (and encourages) the incorporation of visual elements.

3
Hypertext and Hypermedia

In the essay "Opening Hypertext: A Memoir" Theodor Nelson explains that in the 1960s hypertext was proposed as a practical proposition: using computer storage and display mechanisms, writers could create multiple "branching" and alternative structures in their work and allow viewers to navigate through them (46). Believing that the structures of ideas were not sequential, Nelson defined the form in his book *Computer Lib/Dream Machines:* "By 'hypertext' I mean non-sequential writing" (44). At its roots, in Nelson's schema, hypertext is encompassed by hypermedia, a presentational media system that presents pictures (moving and static) and sounds (spoken and instrumental) including "hyperfilms," "branching audio, music," and "branching slide-shows" (44).[1] A formal expansion of hypertext, hypermedia consists of visual, alphabetic, and audio components and performs in dimensions that printed formats do not allow. In the 1980s programmers developed tools that facilitated such nonlinear writing, enabling authors to create links within and between texts while simultaneously incorporating visual, kinetic, sonic, and static verbal texts. In these forms a number of different files (comprising various media) are programmed into arrangement with each other, presenting poems in segments through a series of links (which can be simple and obvious or complex and veiled), or may be otherwise conceived, as Bolter observes in the second edition of *Writing Space,* as "visual objects with which the reader interacts" (156).

Michael Joyce proclaims in *Of Two Minds,* "Hypertext is, before anything else, a visual form" (19). By this he means that hypertext "embodies information and communications, artistic and affective constructs, and conceptual abstractions alike into symbolic structures made visible on a

computer-controlled display" (19). Joyce is committed to the principle that the visual overview of a text provides readers with key insights, enabling them to read where connections are made and to locate themselves amongst a myriad of nodes. Visualizing the symbolic structures of texts through "maps" or charts is privileged over navigation through the use of visual images (e.g., photographs or drawings). Joyce considers hypertext as "a visual form" from another angle: "The text becomes a present tense palimpsest where what shines through are not past versions but potential, alternate views" (3). While satisfying hypertext's potential as a combinable form—a reading and response tool enabling the creation of integrated documents—Joyce expands the circumstances of composition. The palimpsest, a text that has been written or inscribed upon multiple times, not only suggests process (and possibly collaboration) but also that parts of each text remain partially visible. Hypermedia allows one to differentiate and isolate each textual layer. In contrast to the analog model of collage, where texts are tiered but firmly fixed atop one another, a viewer can digitally "peel" back layers of a montage to reveal an undiminished mantle. Whole texts thus become unified fragments. The palimpsest, with its tactile roots, offers a useful model for hypertext on both an individual and grand scale in that it is precisely, and on more than one level, signifying the importance of visuality. In digital poetry the reader can often uncover multiple, yet individual, layers of text.

Joyce's concept of hypertext does not always extensively address or explore how "visual" aspects of "writing" have become a predominant feature of digitally interconnected texts.[2] Joyce's basic sense of the visual is limited to addressing visuality's effect on the organization of the text. It allows for a diagrammatic (topographic) representation of the structure of the text on the screen but does not account for the new materialization of language, where images are literalized (or confounded) through digital means. Alternative critical discourses—based in the visual arts—are as relevant to digital poetry as computer science and other forms of communication technology.

Once hyperworks were developed, all the principal possibilities of contemporary digital poetry were already available, and the genre has proliferated in the past twenty years by synthesizing and cultivating each of its modes. We can identify distinct characteristics in every digital poem, but the accumulation of styles confounds any single critical definition of artistic works that merge poetry with digital technology. Accordingly, I have formulated a typology below.

Historical Forebears

Although Joyce claims that "hypertexts can never be adequately represented in print," several books are often referred to as precursors to hypertext (21). Among the printed texts first cited by Nelson as being hypertextual are Laurence Sterne's *Tristram Shandy,* Julio Cortázar's *Hopscotch,* and Edgar Lee Masters's *Spoon River Anthology* (*Computer Lib/Dream Machines* 45). Charles Bernstein, in a passage cited in Glazier's *Digital Poetics,* suggests that hypertextual dynamics are found in "Buchner's *Woyzek,* or Blake's *Four Zoas,* Dickinson's fragments or fascicles, or in Reznikoff or Zukofsky or Oppen or Spicer or Stein; or in Grenier's great poem, *Sentences*" (46). Works by James Joyce, Italo Calvino, Jorge Luis Borges, Marc Saporta, and the "Choose Your Own Adventure" children's books have also been cited as hypertext prototypes (Bolter, 2nd ed. 140, 148; Joyce 137).

Printed volumes prepared as companions to works such as Olson's *The Maximus Poems* (*Guide to "The Maximus Poems" of Charles Olson,* George Butterick), Pound's *The Cantos* (*A Companion to the Cantos of Ezra Pound,* Carroll F. Terrell), and Ginsberg's *HOWL* (ed. Barry Miles), to name just three examples, are an indication of intertextuality (and/or transculturalism) and hypertextualism in printed formats. These companion volumes speak to the high level of intertextual connections inscribed in these poems. At the very least the number of obscure references embedded in the poems prompted scholars to explicate and unravel these complexities in separate publications, as Eliot had done in his "Notes" in *The Waste Land.*[3]

Technological Conditions

Nelson's idea of hypertext appeared long before any actual hypertexts, which were not mechanically possible until the development of the appropriate technology. The first "hypertext system," "Augment," was developed by Doug Englebart in 1968.[4] Nelson attempted to realize his vision mechanically through the development of a complex system called Xanadu, which came together in the 1980s, and according to Nelson's *Literary Machines* was acquired by the software company Autodesk in 1988. By the mid-1980s other hypertext programs, such as GUIDE (for OWL systems), were developed. The advent of micro- and personal computers equipped with software capable of interconnecting disparate bodies of data, particularly Apple's in-

troduction of HyperCard in 1987, was a significant advancement.[5] HyperCard was a versatile and convenient program (as are many programs that have succeeded it), enabling authors to invent a range of approaches to creating work; thus, hypertext developed much further—first offline, then on the Internet—as more people became familiar with it. Not coincidentally, the first international conference dedicated to the topic took place in 1987.

As Thomas Swiss reports in "Music and Noise: Marketing Hypertexts," Eastgate Systems, based in Watertown, Massachusetts, "is a pioneering publishing company which has managed to create a kind of 'local' scene for hypertext writers" (par. 3). Since the early 1990s Eastgate has published (thus preserved) numerous titles of hypertext literature, including the electronic journal the *Eastgate Quarterly Review of Hypertext.* Eastgate regularly published hypertext poetry when few other publishers in the United States were willing or able to produce literature that required viewers to load files onto computers. It was the first explicitly electronic publishing company to promote digital literature and remains one of the few publishers that does so.[6] Several important digital poets, introduced below, published their work through this publisher/software development group.[7]

Individuals associated with Eastgate developed various pieces of software, but the hypertext program Storyspace is probably the best known. Storyspace, devised as a "writing environment" in which to read and write hypertext prose works, was written and developed by Bolter, Joyce, John B. Smith, and Mark Bernstein and produced by Eastgate beginning in the early 1990s. In the guidebook *Getting Started with Storyspace* the authors celebrate the fact that "hypertext writers can create documents that respond to individual reader needs and interests, offering readers a range of choices instead of imposing a single, fixed approach" (1). The engineer's objectives, when put into perspective, were immense: imagine James Joyce not only having to write but to invent the mechanism that allowed this work to be presented and read. Storyspace succeeds in its efforts to offer a variety of methods through which digital texts can be explored, read, and written. When the program is fully applied, readers can choose between three ways of reading through a Storyspace document: tree map, chart view, or Storyspace map.[8] The Storyspace map is an important invention, allowing viewers to have a visual overview of the texts they are "reading." As software it provides suitable ways for authors to directly or loosely organize electronic texts by virtue of its ability to draw links between blocks of text. Titles pro-

duced using Storyspace were written (alphanumeric) texts, with links to other texts (lexia) within the same title; some included static visual images melded with words.

Early titles were published on diskette and transferred to the hard drive of the user's computer. On the Internet hypertext was first seen in Gopher systems, which were used for information retrieval, but it soon became the lingua franca of the WWW, which operates using a language called HTML (HyperText Markup Language), enabling programmers to interlink pages and incorporate all types of media files.

Digital music compositions began in the 1960s, but the common user terminals that could respond with sound were not available until the 1970s, at which point voice-input devices and voice-recognition software had also been developed. Even so, they were implemented in few hypertext works during this period.

Typology

Joyce classifies presentational modes used by hypertext authors into two distinct categories: "constructive" and "exploratory" (41). Although their utility has been questioned by critics such as Espen Aarseth, I adopt these models as the broadest useful codification of hypertextual literature. Within these established parameters nearly all works at this juncture are recognized as explorative, and within this vein of production various forms emerge that pertain to the media inscribed and methods of navigation, as outlined below.

As defined by Joyce, exploratory hypertexts reflect the author's sense of structure but allow their audience to guide themselves through a text as interest, engagement, and curiosity dictate. This mode, according to Joyce, ideally allows the audience the ability "to create, change, and recover particular encounters with the body of knowledge, maintaining these encounters as versions of the material, i.e. trails, paths, webs, notebooks, etc." (41). Readers explore a body of work that has been set before them on the computer. Constructive hypertexts, on the other hand, are steadily built by their audience, as part of a process of transforming the knowledge previously presented; Joyce has described dynamics of such texts as "versions of what they are becoming, a structure for what does not yet exist" (179), and "serial thought" (189).[9]

Within the exploratory hypertexts introduced in this chapter, a structure (that cannot be altered) is projected, through which a user navigates. Four

types of poems were designed: those which feature only text presented as a series of nodes that are directly interlinked (sometimes with some sort of "map" that can be used as guidance); those that feature significant graphical and kinetic components (i.e., hypermedia), also based on the 1:1 link-node premise; those that present a virtual object that the user negotiates (without having to constantly "click" on links to traverse that text); and those that are formed through methods of aleatoric progression.

Exploratory Poems

Text-Based Works

Since hypertext is a visual form, graphical information, sometimes in the form of collage, is almost always present (though sometimes only in the form of maps).[10] Thus, only a few strictly textual works are on record. Rod Willmot produced a hypertext poem titled "Everglade" (1989), which successively interconnects each stanza of one of his nongraphical poems.[11] A hypertext version of Queneau's famous *Cent mille milliards de poèmes,* programmed by Tibor Papp and included in *Alire* 1, is among the most versatile of such works. Papp creates an interactive version of the poem, in which the viewer is able to transpose lines from any of Queneau's original ten sonnets and easily create her or his own sonnets with them. The program also quickly generates new aleatoric sonnets, which qualifies this work as a matrix poem as well. The interface is easy to use and understand; a brief technical guide is provided, as is a programmer's note that explains the rules of Queneau's poem, and the surrealist practice of the "cadavre exquis" (exquisite corpse) technique, in which authors contributed individual lines to compose collaborative poetry, was also an inspiration. Material attributes of Queneau's prehypertext poem, ripe grounds for hypertext representation, are well treated by Papp. The only minor inconvenience in this piece might be that the poems cocomposed by the program and viewer cannot be automatically printed out from within the program itself. As Papp's intention is to make an electronic version of the poem, this facet is not a flaw but rather a fact of the experience (although results can be transcribed by hand or photographed).

In the early 1990s Eduardo Kac made a hypertext poem with HyperCard entitled "Storms" that first appeared in *Alire* 8 (1994).[12] Although basic in technical comparison to his work with holography (see appendix B), "Storms" does contain a fundamental similarity: if the viewer does not do

anything (i.e., click on a link in the hypertext, move around the holograph) nothing new happens on the screen. A series of eighteen words and brief phrases (in cursive white lettering on a black background) are contained on nineteen individual stacks (one word, *ALL,* appears with two different linking configurations). Stacks are interconnected through each letter that appears (and sometimes in the space around the words) on the screen. The words Kac has chosen to link poetically match up with each other in any order of viewing. To show two samples that reflect the poem's vocabulary and overall content, this passage, which was made by clicking on the first letter of each word that appeared, reads like a minimalist poem:

ALL
ENDS
MAIN
STORIES
RESURFACE
LIKE
A FACE
A SCENT
ALL
BLENDS.

This sentiment, that has a "one world" aspect to it, or at least suggests that ultimately everything becomes synthesized, is extended in another rendering of the words:

ALL
MELTS
SOME
STORIES
RESURFACE
LIKE
A FACE
A TRACE
OR
ELSE
ENDS
MAIN

MEMORIES
REMAIN
LIKE
A SCENE
A SCENT
ALL
BLENDS.

Kac writes in the readme file that the linking structure "originates in vocalic and consonantal bifurcation," which presumably involves finding a way to arrange or map words in series so that they complement rather than disrupt each other. An example of such a flaw (if it is a flaw) might be the case if word-letter combinations *LIKE* and *ELSE* or *ELSE* and *ELSE* were juxtaposed. This never happens in "Storms" because Kac has identified how the voice, or word, can and will split. The application of bifurcation is one of the interesting—and somewhat mysterious—contexts Kac builds for the work. He cites the Sefirotic system of the kabbalah as an analogy and influence, borrowing a linking structure from this metaphysical document (i.e., the bifurcations present in the kabbalistic tree) to organize the poem. Contrasting his work to printed presentations, Kac claims that the poem has no end, and he writes that the "reader is now presented not with one narrowed-down selection of words in strings or in graphic layouts, but with an electronic field that is a complex network with no final form." He has chosen and arranged the language and phrases so that the viewer is never faced with awkward juxtapositions. Since there are fewer than two dozen stacks involved, however, words themselves begin to repeat, though often in different patterns.

Hypermedia

The vast majority of hypertext poems inscribe some other medium (or media) along with text, a textual condition known as hypermedia. Pictures, animation, and sonic elements become part of the interlinked poem. Compounding the text with an image is not only pictographic but a textural device in which graphics provide texture to the visual scenario, which may or may not literally relate to topical information presented elsewhere. Though the text can sometimes be absorbed by way of several organizational schemes that contain visual aspects (like maps or features that enable the viewer to view a listing of links available and the history of links

taken), the graphical interface is the one that is often most pronounced and readable.

One of the earliest HyperCard publications, Amendent Hardiker's *Zaum Gadget* (1987) is the most extreme example of such work. The editorial information contained in the files describes it as an "interactive cyber event" with "many possible hyper-coordinates." *Zaum Gadget* is divided into three sections (Zaum Bother, Zaum Wound, and Zaum Sound), and numerous subsections. Links are made with graphical cues, and when activated the (black-and-white) screen becomes filled with static and kinetic images. Sound effects (both automatic and interactive mechanisms as mouseover activation) complement the various manifestations of rudimentary and clip art–style images and fragments of language that are presented. At certain moments viewers are prompted to enter information in a dialog box, and pop-up boxes are used to convey direct messages, such as, "Learning to conduct the noises of our surroundings is an essential strategy for future survival & well-being. Noise is to be considered [a] profound form & source of neuro-psychical energy." *Zaum Gadget* honors the radical branch of Russian futurism that operated using "transrational" language, that sought to be indeterminate by using phonemes and morphemes instead of words (at the same time building meaning through phonetic translation, accumulation of sound, and the roots of language). Hardiker's project would not be considered poetry by certain historical standards (in fact, it uses as its base text excerpts from the manifesto "The Letter as Such," by Velimir Khlebnikov and Alexei Kruchonykh), although its use of thoughtful hypertext and poetic language models a poetics that makes a statement about life and artistry in a mode that shares expressive techniques with Kruchonykh and Khlebnikov (i.e., elements of surprise, atypical typography, exaggerated sounds). The work is a set of interlinked documents designed to draw the viewer into the text via words, sounds, and visual imagery. A year later William Dickey began to use similar techniques in crafting a series of poems ("Fours," "Heresy," "Zenobia, Queen of Palmayra"), that reflect aesthetics comparable to *Zaum Gadget.*[13]

In a more colorful presentation called "Les mots et les images" (The Words and the Images [*Alire* 5 (1991)]), Jean-Marie Dutey uses hypertext to investigate René Magritte's views on the ambiguity between signifier and signified. Here the viewer is initially presented with a grid of three columns and seven rows that takes up much of the screen; the topics shown include "proposition," "word(s)," "representation," "signification," and so on, as

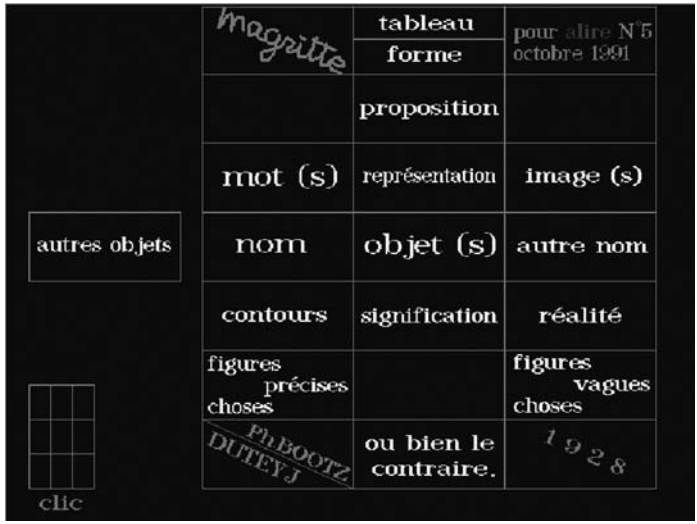

Fig. 3.1. Jean-Marie Dutey. Screenshot of main interface from "Les mots et les images." *Alire* 5.

shown in figure 3.1. In the empty space on the left the phrase "other objects" appears above a smaller, empty three-by-three squared box labeled "click."

When a viewer clicks on one of the boxes, a graphical drawing plots the connection between words by visual means as illustrated in figure 3.2, a screen capture illustrating what happened when I selected the "autres objets" (other objects) box.

On some links words are circled and interconnected by colored lines; on others words are circled and shown with new background colors (in one of the iterations, even the empty box is circled, though it leads to a nonfunctioning link). The color of each of the lines (or text bubble) appears in one of the nine squares at the lower left. A viewer activates links by clicking on one of the squares and is led to a series of screens that contain statements regarding the relationship between text and image (pages about Magritte and *Alire* are also included). The verbal exhortations are accompanied by a hand-drawn illustration. The text and pictures revivify a series of eighteen paintings and an article written by Magritte in 1928. These subpages are not end points; clicking on a picture will lead the viewer either to another picture or back to the main interface to pursue another topic. Each verbi-visual page is a separate component of Magritte's ideas. The non-

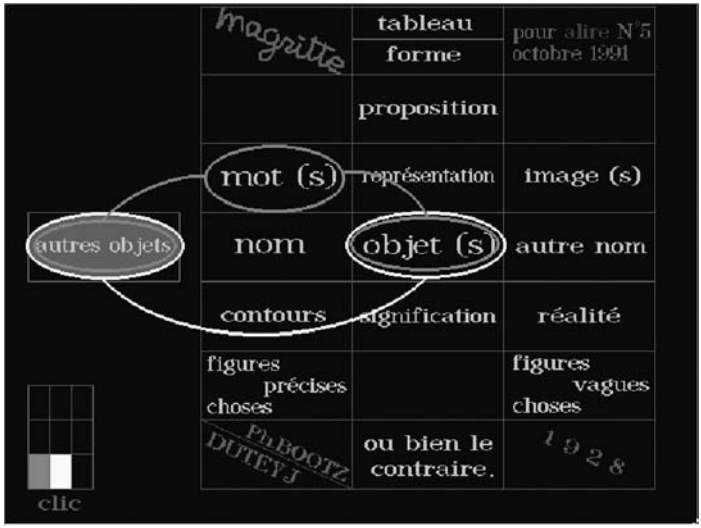

Fig. 3.2. Jean-Marie Dutey. Detail of screenshot of graphical overlay from "Les mots et les images." *Alire* 5.

linearity of the piece does not present any problems, and because its interface is easy to understand, "Les mots et les images" invites a compelling hypertextual exploration and reconsideration of Magritte's ideas in poetic fragments.

Moving away from using texts by other writers as the basis for a hypertext poem, Jean-Pierre Balpe, using Hypercard, built an original work out of his own poetic fragments called "Autobiographie" (1994), which, because of its complex programming scale, functions as if it were being automatically generated. The left side of the opening interface shows the title of the piece, along with the present date and time, and lists the number of "journeys of an ordinary life" the user has taken. A graphic on the right is a line drawing of a half-naked man with a startled expression who is apparently being kicked out of a building; words emitted from his mouth read "Help! Que faire?" and are a link that opens a pop-up box that explains that viewers should click anywhere they choose to produce diverse poems. Interaction with this poem produces many kinds of results. In some areas clicking on the screen brings the viewer to a single poem of roughly sixty lines or to several such poems at once (as in fig. 3.3). Every link leads to a page titled by the designation of a date (presumably, though not necessarily, of a life) with

Fig. 3.3. Jean-Pierre Balpe. Screenshot from "Autobiographie."

a corresponding number (e.g., "14025th day," "1831st day"). Typically, the poem conveys a dreamlike narrative, which loosely coheres through various thematic words (e.g., "night" and "moon" or "herds cross the prairie" and "wavy fertile plains" in "8316th day"). In one section two long, scrollable pieces, one that has a traditional look and one that does not, are interconnected so that when the viewer scrolls down one piece, the accompanying poem also shifts location in its narrative. In a similar section of "Autobiographie" the presentation of multiple texts begins with the appearance of a graphical image that is replaced with four vertically oriented (i.e., scrollable), randomly generated texts, as partially seen in 7569th day" (fig. 3.3).

These texts contain various dynamics: when a word is clicked in the column on the right, a new set of words is produced in another column. Clicking in other columns can replace a section of the screen with a portion of the image that appeared earlier. In addition to being interactively arranged, the design encourages viewers to consider a horizontal reading of the poems (as did Mallarmé's "Un coup de dés").

Balpe uses a combination of static images and text, though some sections are text-only, as in figure 3.4. When a viewer clicks on one of the boxes, the phrase changes (sometimes changing fonts as well). This type of presentation is more fragmentary, requiring the viewer to assemble the pieces. In this example the three sections form what can be read as a single statement

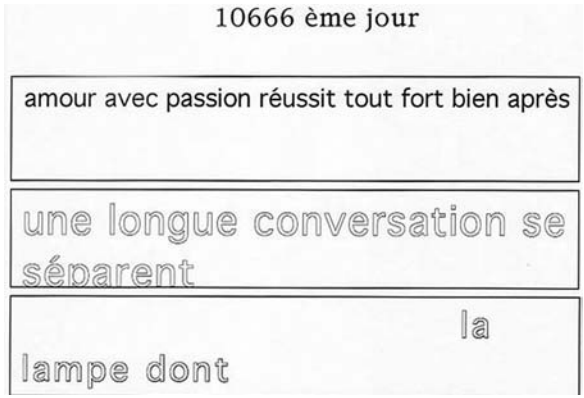

Fig. 3.4. Jean-Pierre Balpe. Screenshot from "Autobiographie."

love with passion succeed all strong well after
a long conversation separates
the lamp from.

Here the viewer can produce an endless number of short, abstract poems in conjunction with the phrases Balpe has inserted into the program, which can be printed or transcribed. Balpe has also programmed kinetic sections, in which several short phrases or passages appear (sometimes overlapping) in different fonts, in random sequence, for just a few seconds. By alternating the presentation of language across various parts of the screen—as did authors whose works appeared in *Alire*—Balpe promotes the idea that there is always more that can be added to any form of communication than what is initially or directly stated. The kinetic work passes quickly; its rapid pace may frustrate the viewer who desires a complete reading. This objective is not the point, however. In creating a shifting body of language that demands so much attention, Balpe practically invites viewers to devote only as much attention as they desire and to use the program as a tool to receive brief fragments. The idea behind this work, writes Balpe in "E-Poetry: Time and Language Changes," was to make an "ever changing" autobiography; the sense of autobiography here is not literal but fantastic, as the author proposes multiple selves, or at least multiple possibilities for oneself (which has been a theme of interest from, at the very least, Walt Whitman) (7).

Another model of link-node hypermedia is presented in *A Life Set for Two,* a poem Robert Kendall created using Visual Basic programming that was published by Eastgate as part of the *Eastgate Quarterly Review of Hypertext* (1996).[14] In comparison to other Eastgate authors, Kendall presents a different approach to presentation of the digital poem; his work in general is akin to the hypermedia productions presented in *Alire,* and in certain respects it can be viewed as an advancement of that style of work in that the interactivity within the hypermedia environment is more developed. Kendall successfully resists and alters what he refers to in the essay "Hypertextual Dynamics in *A Life Set for Two*" as the "static structure" of hypertext, where "the nodes themselves remain as fixed as pages of print" (74). The narrative of *A Life Set for Two* is arranged as a poetic conversation at an imaginary café ("Café Passé"); different layers of text are items on a menu, and each includes multiple threads that are framed in the piece as variant "moods" that can be changed after any point in a viewing. The menu selections and moods are programmed to change on a second viewing. To this end Kendall implements a type of slot system in which various words can be used in a particular portion of a line. What transpires in this dialogue between two people (represented by "me" and "her") is an exchange of poetry, ordered and activated by the viewer, which kinetically forms on the screen atop a design that depicts a placemat on a table (with spoon, knife, fork, etc.), as shown in figure 3.5.

Each segment of poetry shown appears along with a small window below (not shown in fig. 3.5), which gives the viewer an opportunity to "Reread" (the text of prior screens), to set "Options" (such as returning to the main screen, changing mechanical variables like the speed of presentation and pause time at line breaks, or exiting the program), or to proceed "Onward." According to Kendall *A Life Set for Two* changes "dynamically in response to the different situations in which the reader places it"; this means that the text customizes itself according to settings (or "states") selected by the reader ("Hypertextual Dynamics" 74). Animated words then spill into their order on the screen, their color and order reflecting the reader's choices; in his introduction on the *Life Set for Two* diskette Kendall describes this method of assembly as a "three-dimensional piece of writing—a complex verbal object with many surfaces." The patterns the words take are programmed to allow hundreds of combinations to appear. The poetry itself is narrative in formation and does not show any inclination toward avant-garde aesthetics, as exhibited in this sample:

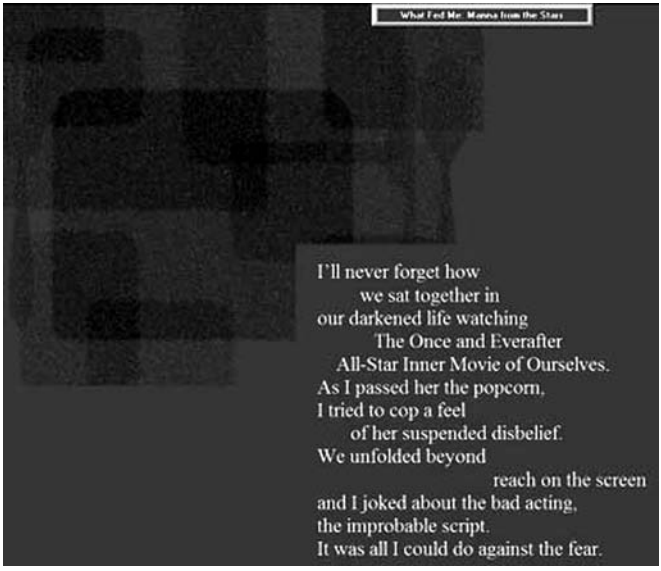

Fig. 3.5. Robert Kendall. Screenshot from *A Life Set for Two. Eastgate Quarterly Review of Hypertext* 2.4. (1996).

She kept her true pain
in a private room of her loneliness
with the shades pulled down.
She didn't know
I could see her naked
silhouette
swaying behind those shades,
swaying piteously with a glass in hand
until the lights went out.
She didn't know I had
hidden the dignity
she planned to slip back into
afterward.

The writing that Kendall has input and programmed to perform has lyrical quality and contains clever sensibilities, particularly in its unique programmatic transmission. It is a stand-alone text, with no sonic dimension, that relies heavily on graphical energy and kinetic words. *A Life Set for Two* has

the feel of being one of the first chapbooks of animated digital poetry. Using the computer, Kendall writes in the readme file for his "SoftPoems," "turns literature into visual art, words into theater. Graphics and animation bring the text to life on your monitor in choreography of color, motion, and meaning. You, the viewer, become a participant in the drama as you control the poem from the keyboard of your PC." In *A Life Set for Two* Kendall again produces an example of work that provides ample proof that such an ideal can be set and met in digital poetry.[15]

Several hypermedia poems appear on *The Little Magazine* CD-ROM, including works by Eugene Thacker, Glazier, and Sandy Baldwin (a.k.a. "Gully Foyle"); these works mix hypertextual elements with linear structuring. Several pieces on the magazine CD contribute to broadening the concept of what can be done in the hypertextual presentation of a digital poem. Benjamin Friedlander's "Home" unveils the archaeology of a short poem. Beginning with the initial screen, which shows the poem's original handwritten version, a viewer moves to three subsequent typescripts of the poem while listening to a soundtrack of the poem being typed. The "final" version of "Home" is delivered in the form of Friedlander's voice reading a draft of the poem that never appears on the screen. Friedlander's work reveals a poem in process; such multimedia techniques hold obvious advantages in the preparation of scholarly writing or in any situation where multiple layers of the same text are engaged simultaneously.

Virtual Objects

Intergrams was the first digital poetry publication by Jim Rosenberg.[16] This HyperCard work shows a most unique application of multilayered hypermedia, described by Rosenberg in his introduction as "interactive poems in a diagrammatic format" presenting alphabetic texts programmed to layer atop one another in "word clusters" that are connected by diagram notations (fig. 3.6). Rosenberg's internal syntactical symbols enable author and reader to navigate through the various word clusters (fig. 3.7). On the viewer's cue the dense layers dissipate to show a single text, which has already been processed (as described by the author below).

A single stanzalike form emerges from a mass of unreadable text. Passing the cursor beneath the center of the bottom box brings up the following:

connection child seeing first flying helm spokes
as madness feather floe knives

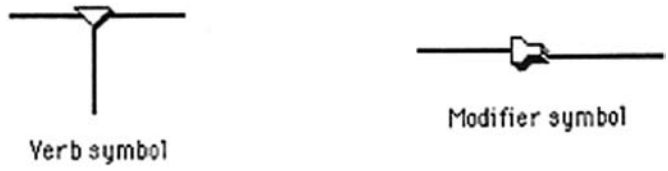

Fig. 3.6. Jim Rosenberg. Detail, frame from introduction to *Intergrams. Eastgate Quarterly Review of Hypertext* 1.1 (1993).

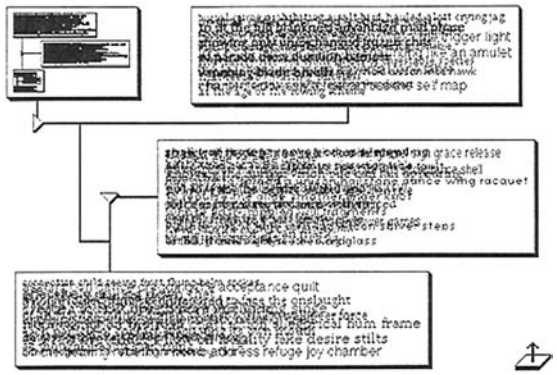

Fig. 3.7. Jim Rosenberg. Screenshot from "Intergram 10," in *Intergrams. Eastgate Quarterly Review of Hypertext* 1.1 (1993).

owing us a smoother stunt haphazard other world
safe enough without the stacked
dimness peddler tether flight totem scrapings
blown together for starting a memory fire.

Each cluster, as previously mentioned, contains four distinct texts, which a viewer may or may not unveil. Each passage is an abstract yet flowing fragment, if not a short poem itself. From this point a reader chooses whether to pursue a narrative within the word cluster or move to a new cluster or layer. In this example I backtrack, using the verb symbol, to see what sort of (potential) relationship exists between the interconnected clusters. Passing the cursor to the center of the middle box reveals the following:

arranger of the audience scratch face hull gravel sign grace release
dressing down the member dirge's sedative act acceptance shell

with any random volunteer's tired mouth history
still pulsing tangle rhymes and never finding
where the sting walk uses lift inflated bower games
to interfere with sunlight.

Reading in this manner gives the first text a sense of prologue. Both passages are discursive verbal structures without punctuation that construct a poetic landscape as viewers navigate through the documents. Though random, this unpremeditated entry point, with its "first flying helm" and "arranger of the audience," sets the stage for whatever text comes next. The viewer participates in a serialized construction process, guided by impulse and curiosity if not by some other formal strategy. Clicking on the inner complex box in the upper left corner brings word clusters from a second level of "Intergram 10" to the foreground.

In addition to the possibilities of interactively reading at this level or proceeding to another inner complex, an interstitial poem emerges (without any further effort by the reader) from words clearly visible in the margins. In the top cluster of figure 3.8, for example, we can read:

. . . tangle dive
. . . disease
. . . multiplicity shells
. . . voice
. . . resignation

And the other cluster contains

. . . the wander point
. . . drowners
. . . minder
. . . windings.

Registering these accidental elements could make an impact on navigation. At the very least, imagery related to voyages or aquatic activity (e.g., "tangle dive," "drowners") propels a possible strain of text.

This particular, if loose-knit, theme greets the reader at any entry point of the document—one's method of approach to the files makes minimal difference in terms of verbally riding through the text. The opening page of "Intergram 1" presents an "inner complex" at upper left, which is ver-

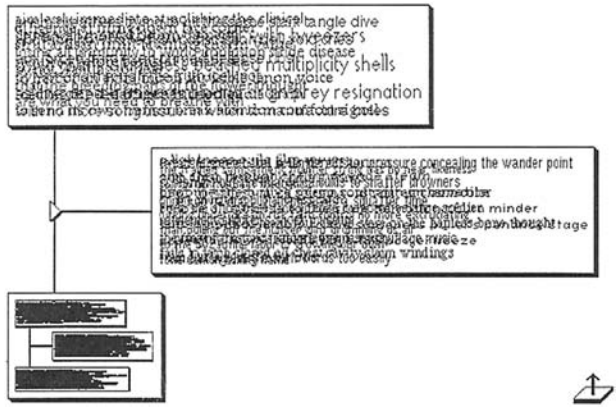

Fig. 3.8. Jim Rosenberg. Screenshot from "Intergram 10," in *Intergrams. Eastgate Quarterly Review of Hypertext* 1.1 (1993).

bally connected to a text cluster to its right and a text cluster at the bottom; this configuration is connected to a second "inner complex" located in the middle of the screen between the two text clusters, as seen in figure 3.9.

If the viewer examines the text on the upper right, four two- or three-line passages emerge, two of which involve oblique references to movement in physical space or between psychic locations (i.e., "the keeper of the ice tunnel / too obviously wanting to look crazy" and "to dive behind the mental cost / of tracking where the cooked emotion ledge / is inches off the flat space on the arc"). The other passages address emotional and psychological conditions that are specific but open enough to remain unattached to any particular subject. The structure provides multiple entry points, each of which leads the viewer onward at her or his own discretion. A viewer that opts to view the word cluster at upper right in "Intergram 1" can unveil a sequence of passages (in different fonts), hewn fragments denoting journey, landscape, and emotional conditions:

a flight squandered quivering bow
hobbled by its root coherence

acquires only
a badly cradled verse catastrophe

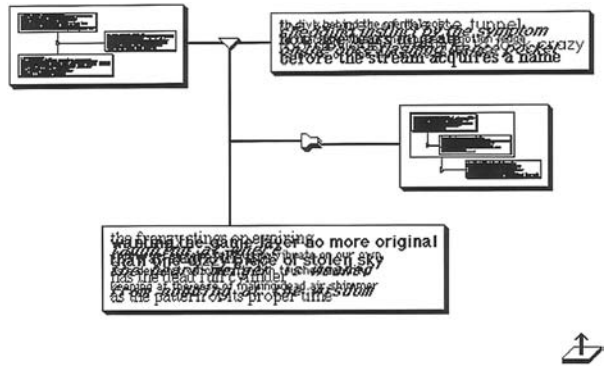

Fig. 3.9. Jim Rosenberg. Screenshot of frame from "Intergram 10," in *Intergrams. Eastgate Quarterly Review of Hypertext* 1.1 (1993).

a moon circle no less violent
for the smallness of its tongue image
telling the words where to drag
the deformed echo pulse
to make the storm a less managed relapse

the song rind darkening because
that personal bird pocket
refuses to contract.

This most linear reading (starting with the upper left section and reading from left to right) produces an antilinear aesthetic: "Flight" is "squandered" by "root coherence" that tells "words where to drag." The poet, using crafted language, creates an atmosphere in which the viewer's senses are uniquely transformed by the accumulation of nonlinear juxtapositions used to build the narrative. Clearly, Rosenberg's approaches to both syntactic and structural composition are unconventional. Because he disregards convention in many ways, his texts need to—and do—establish a style and flow within themselves that do not require punctuation and order. The overall impact of the expanse of language is more important than a systematic reading of narrative.

All of Rosenberg's texts feature subtle yet noticeable amounts of recycled text (where unique words or phrases appear in more than one place).[17] In "A

Conversation with Jim Rosenberg," the poet discussed his method of deriving and arranging the phrases:

> I maintain what I call "reservoirs" (Jackson Mac Low calls them "vocabularies") which are precompositional groupings of phrases. At each step I take the existing generation of reservoir, chop it up, permute it using chance operations, and use the resulting "prompt sheet" to write—by hand, so to speak—the next-layer reservoir. At the end of this process I am writing finished phrases from the last-layer reservoir. I will typically do quite a number of pieces from a given reservoir.
>
> Somewhere about the middle of *Intergrams* I began doing an "edit phase" that has become very important to me. When I have the first draft of finished phrases, I cull these. A few—I would guess typically no more than about 10%—are good enough to go into the finished work mostly intact, with just minor editing. The rest go into a "metamorphosis soup." (When those insects that undergo complete metamorphosis enter the pupal phase, their bodies literally dissolve into a soup of cells. Many of these cells migrate to completely different places in what will be the adult insect, and a whole new kind of organism is assembled from the cells. That's not unlike how my edit phase works.) I pick out the pieces that still work, and then pull in words or pieces from "sacrificed" phrases reassembling new phrases. I do "cheat" occasionally—putting in a word that didn't come from the first finished phrase draft—but this is pretty rare.
>
> From the result of all this, I pick the final phrases for the finished work. My wastage percentage here has gone down quite a bit; it used to be that I would throw out about 2/3 of the final phrases, but in the work I'm doing now, *The Barrier Frames,* the percentage of kept phrases is pretty high. At this stage I move the phrases about letting them attract one another into clusters, with the structure emerging from the words. (Rosenberg, "A Conversation with Jim Rosenberg")

This design demands that the reader's concentration and memory derive meaning by fusing their interaction (construction) and experience (response) with the text. Rosenberg builds his reservoirs from innumerable sources and laboriously processes them to establish vocabulary for what is,

essentially, a visual database. He explains the process in an email correspondence:

> The "base level" reservoir consists of phrases that were simply written by hand . . . and go back directly to material I wrote in notebooks in Berkeley in the early 70's. . . . Based on the file dates I have on my machine at the moment, it looks like this base reservoir goes back to 1984. . . . I take a section from the reservoir, chop it up into very small fragments (the fragment size is typically roughly a measure in the sense I've written about concerning prosody, but can vary somewhat). The fragments are permuted randomly, and the resulting document used as a prompt sheet to write the next level reservoir. Those phrases are written by hand, in some cases only loosely based on the prompt sheet; I don't have rigorous rules e.g., the words "have to" come from the prompt sheet, etc. Then the process is repeated: these phrases are chopped up, permuted, and used as prompt sheets for the actual words that will appear in the finished piece. When I'm writing words that will go into the finished piece, I'm much more likely to use only words that appear in the prompt sheet, but I don't enforce that strictly; in fact I usually like it when I find myself departing from the words on the sheet. I don't make any effort to make the phrases in the second level reservoir writing that could be publishable as-is and stand artistic scrutiny "on its own"; in fact in some cases I do run-on paragraphs that would be terrible if published, because I know I'm only going to chop the phrases up and permute the results, so there's no reason to make them "finished." The goal in writing these phrases is to produce a "productive vocabulary". In this phase I use free association quite a lot. Free association has a bad name in some circles; there are many people who believe that free association is incompatible with discipline. I disagree, of course. The incompatibility is resolved by the reservoir method, wherein the *products* of an association are kept, but not the association itself. The axiom I use here is this: in freely associating from A to B, keep A, keep B, do *not* keep the link from A to B. Free association gets a bad name among people who assume one will be using it to produce "finished works." All of this relates to another whole issue, of course, which is how uncommon precompositional methods are in writing compared to (say) music. You wouldn't

> imagine how it was *possible* to keep A, keep B, but discard the link between A and B if you didn't have an understanding of precompositional methods. (email 1997)

Rosenberg has given himself permission to design texts and textual structures that are, by their own nature, never completed by the viewer in the way that one finishes reading a book. Even a viewer who reads every screen of *Intergrams* has only finished a single reading of the work. This viewer may or may not return to the work, but alternative readings are obviously possible. By forgoing narrative that obeys grammatical rules and instead applying creative ones, Rosenberg, among others who pursue aleatoric practices, frees himself to concentrate on the construction of both the verbal phrases and the intricate structures within the clusters.

The multiple files that make up Rosenberg's digital poetry (at the commands of the viewer's mouse) work together to transmit a singular form of highly processed language. Rosenberg's work is precious and unique among the many uniquely contrived computerized poetry productions. Though they are nonlinear hypertexts, they do not link *to* anything; the link instead reveals different layers of veiled language within the poem. Rosenberg shows simulations from these works on the WWW, so they are now positioned within a larger body of texts. The reader must click on the area below the clusters in order to access them, however, disrupting the flow of the original materials.[18]

Since computing technology became portable in the mid-1990s, I have seen numerous authors (including Rosenberg) present their work in public. In performances Rosenberg recites from a screen projection of his work. When no projector was available at a 1997 gathering in London, he read from the screen of his laptop and raised the fingers of his left hand to mark which layer of a particular text he was reading from (as the other hand guided the mouse across the screen). In live presentation Rosenberg lingers on pages and phrases, adding a dramatic aspect to the performance.[19] Seeing Rosenberg perform his work helped me understand its inimitable and alterable dynamics—there is no fixed approach to reading the text. Though the screens (stacks) are static and determined by the author, the viewer chooses how to experience them, working over the text at will. Links between texts—the way bodies of text open into one another—is fluid. The texts are both interpretive and exploratory, although they cannot be altered by the reader (thus removing them from the "textonic" or "constructive"

realm).[20] Rosenberg's application of hypertext ranges far from the typical approaches, which, as in Kac's "Storms," deliver nonlinearity by offering the viewer choices of links that bring a new text to the screen. The mouseover technique, unveiling layers of text, achieves much the same effect. The ways in which the texts are mapped both in "Master View" and in the text clusters, as well as the presence of diagrammatic and symbolic syntax, however, separate Rosenberg's work from everything else being produced.

Ladislao Pablo Györi's concept of "virtual poetry" is of utmost significance in advancing literature as sculptural object in electronic space. Virtual poetry is generated through software or routines that confer diverse possibilities for manipulation, navigation, behavior, and alternative properties of text. Györi began working with digital materials in 1984, "making experiences with computer programming and digital sound, and designing mechanical pieces, with the aid of a primitive software named VU-3D" (email 2004). These investigations inspired him to further explore sound technology, experimental poetry, and three-dimensional imagery and ultimately led to the production of virtual poetry, which first appeared in 1995, created with VRML (Virtual Reality Markup Language) modeling. Györi's work presents three-dimensional interactive digital entities, interlinked words and phrases that appear as though floating in galactic formation atop a dark background. His poems are architectural, constellational models of interactivity, unique data streams of expression, as seen in figures 3.10 and 3.11.

Animated, hyperlinked poetic formations had already emerged, but few authors had yet explored three-dimensionality. Kac's holopoetry, Sondheim's "4320," and Andre Vallias's works are exceptions, though Györi's works differ considerably, as they are composed of a predetermined structure of verbal information that conforms to the physical input and interaction of the viewer.

A video demonstration of virtual poetry titled "Dominio de poesía virtual" (Dominion of Virtual Poetry), containing the text from "Virtual Poetry 12," appears in the *International Anthology of Digital Poetry*. This simulation provides the best illustration of how Györi's virtual poetry functions much differently from any other title seen to this point, and the opening credits indicate that the production includes "VMÚSICA > lenguaje sonoro 3D" (VMUSIC > 3D sonorous language) although sound is not presented in this iteration. As with other kinetic works, the piece begins (in Spanish) with single words and word fragments appearing on the screen in timed

Fig. 3.10. Ladislao Pablo Györi. Virtual Poem 12. Screenshot (Aug. 12, 2004) from <http://www.lpgyori.50G.com>.

Fig. 3.11. Ladislao Pablo Györi. Virtual Poem 12. Screenshot (Aug. 12, 2004) from <http://www.lpgyori.50G.com>.

sequence: "que" (that) is followed by "es" (is) which becomes "que esparza" (that scatter) and incrementally becomes the phrase, "que esparza retahíla en territorio" (that scatter challenges on territory). The fragment *torio* breaks away from the sentence by horizontally pivoting ninety degrees and becomes a link to the symbol for, and information about, "Torio" (i.e., Thorium, a radioactive element) from the Periodic Table of Elements, which appears above (and without visually removing) "torio." Instead of further exploring the element, the demo returns the viewpoint to the text that had previously appeared, which continues to grow when reactivated. The poem proceeds in this manner—where one section of text fluidly leads into another—by a variety of mechanisms. In the demonstration, lines fill the screen while pivoting in motion. When a passage is complete a ">>>>{nexo}" (nexus) button appears and flashes. A mouse, joystick, or data glove can be used to traverse the materials, enabling the viewer to move forward or backward within the piece, and pause to read it.[21] Virtual poetry only concludes when viewers think they have exhausted its possibilities.

Works such as this are leading to the manufacture of new forms of creative expression and fostering international dialogue on contemporary aesthetics.[22] Among many important achievements, Györi's works, which further the type of kinetic exploration that had already occurred in France (e.g., *Alire*), fortify the concept that programming languages are a creative force. Györi's expansive productions establish previously unexamined correlations between objects and subjects in virtual space. Digital media mechanically handle literature in unique ways, and Györi's synthetic mode provocatively exceeds the usual conditions under which a poem is experienced. Györi has thoroughly considered the range of possibility available for digital poems, and in several strongly argued essays, he shows unflinching confidence in the progress of creative processes enabled by digital systems.[23]

Aleatoric Progression

In *Alire* 3 Jean-Marie Dutey's "Les trois petits cochons" ("The Three Little Pigs") uses a grid to present visual hypertext poems. Viewers have to figure out how to interact with the interface and have to work more than usual to actually read what the letters say. A brief introductory note explains that the poem consists of sixteen texts of sixteen letters each; the letters are formed into four lines, each containing a four-letter word (mainly in French, though a few are in English; no obvious connection exists between the language presented and the famous children's story). A viewer essentially navigates by

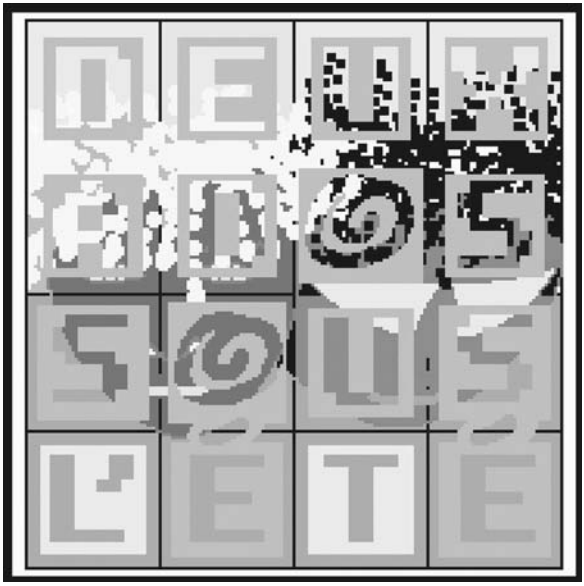

Fig. 3.12. Jean-Marie Dutey. Screenshot from "Les trois petits cochons." *Alire* 3.

clicking on the letters in the grid, moving through a series of minimalist poems. The first poem shown is always the same:

two
teenagers
under
the summer

These lines, visually rendered in figure 3.12, appear in color. Each of the sixteen screens has a unique graphical design, and in some the letters are handwritten, which, as in figure 3.13, initiates movement away from the grid design.

The interesting difficulty that arises in reviewing this piece, which makes it an aleatoric work, is the lack of a cursor to assist with the navigation; a viewer uses the mouse to move the cursor on the screen without being able to see it. The links to subsequent sections are thus made randomly; a viewer can only guess his or her coordinates on the screen, stepping outside the (invisible) boundaries causes the program to close and return to the main

Fig. 3.13. Jean-Marie Dutey. Screenshot from "Les trois petits cochons." *Alire* 3.

menu to begin again. Whether this aspect of the piece is the result of the use of a newer operating system or whether it was the author's intention is unknown. In either case the viewer creates a nonlinear narrative using the structure that Dutey has built. The tone in each of the fragments is light, playful, and easy to follow, as in these examples:

iris
green
iris
blue

hitchhiking
towards
Nice

As with other works presented in *Alire,* the viewer must put mechanical effort into thoroughly engaging with and discovering the content of the poem, requiring both interest and patience.[24]

Poet and Chinese translator John Cayley created HyperCard innovations that—like Rosenberg's work—suspend the use of traditional link-node components.[25] Cayley's work, like Balpe's, blends several areas of digital poetry. In hypertextual terms he creates virtual objects for exploration, while simultaneously programming a kinetic body of work that contains randomized elements. His instigations of "machine modulated" poetry began in 1988 and are gathered under the general title *Indra's Net* (or *Hologography*).[26] Works included in this self-published compendium have become increasingly refined, visually innovative, and complex over time. Cayley's conceptual interests in the digital presentation of poetic material involve a few general approaches—e.g., "machine modulated poetry | books unbound | plastic literary objects | POtential LIterary OUtlawry"—outlined on the *Indra's Net* WWW page, which also includes expansive theoretical essays. These categories announce Cayley's interest in computational, flexible, and equational textuality (note the reference to OULIPO in "POtential LIterary OUtlawry"). Cayley produced seven installments of *Indra's Net* prior to the emergence of the WWW, which were initially published on diskette by Cayley's Wellsweep Press (five of them are also included on Kac's *International Anthology of Digital Poetry,* and some of the stacks are available for download on the WWW).[27] Although each of these pieces contributes to an overall understanding of Cayley's inventive project, and some of the significant motivations of digital poetry in general, it is impossible for me to address each of the titles in detail. Below I introduce his general procedures, briefly discuss early works that establish his complex processes, and elaborate on works that explore alternative approaches to composition.

Before introducing Cayley's works themselves, I will introduce collocation, a technique that plays a significant role in each title. Cayley's collocation process actively produces content through generative algorithms embedded within the program that shuffle language using a formula to determine word placement. Describing some of the details of collocational mechanics in the introductory section of *Moods & Conjunctions,* Cayley writes that the "transformation can proceed with any word in the given text, which we then may call 'the last word chosen.' Any other word—occurring at any point in the given text—which follows (collocates with) the last word chosen may then follow it and so become in turn the word last chosen." In some examples of this work one visual "level" of text appears, forming a stanza drawn word by word from the database. Another variation of the process, that has a startling effect, involves two levels of text being presented. These methodologies have obvious forebears in the mesostic and "diastic" work of

Cage and Mac Low (with Hartman), as well in Williams's "IBM Poem." Cayley's process also recalls visual works that were being done with computers in Fred Truck's "ArtEngine" project from the mid-1980s to the early 1990s.[28] Cayley's approach differs from previous examples, however, in that the texts are not static.

"Hologography," an invented concept built on the model of holography, is another metaphor Cayley uses to describe the mechanical output of the work. According to Cayley, a hologogram is "a pattern of language produced when the words of a given text are glossed, paraphrased, etymologized, acrostically or otherwise transformed, and such transformations are allowed to interfere with the given text; a set of rule, a machine or a computer program which defines or displays such a pattern" (*Moods & Conjunctions*). Like TRAVESTY, the work represents an ordered juxtaposition of words within a continuous string of verbal information. In other words, instead of the angle of light impacting the projections of the work, it is the presence of another text that shapes what the viewer sees. This example from *Golden Lion* illustrates the characteristics of a two-level text described above:

mu**l**tiplying **e**verything c**a**sting
e**v**erything **e**xistence in fro**m** on**e**
moment **t**o anot**h**er infinitud**e** and
so **p**roduces gre**a**ter
perfe**c**tion
everything is su**b**stance **e**ndlessly
mul**t**iplying **w**ith cont**e**nt
int**e**gral
lio**n** the

Leave me the space between.

In this particular example the Zenlike message of the lower text serves as an affirmative follow-up to the expansive, abstract, chaotic view presented directly above it, into which its letters are sequentially embedded in bold typeface. "What you see now," Cayley writes in the introductory section of *Moods & Conjunctions,* is "an irregular solid, a constellation of words in three dimensional space associated and structured by two very different criteria: through their membership of the set of words which composes a particular text, and because they share a particular literary/graphic element."

Cayley's programs mutate before the viewer's eyes, using "given" texts

and kinetic processing. Nine different kinetic variations on a set of themes are presented in *Moods & Conjunctions* (Indra's Net III, 1993–94). Collocational procedures drawing from three different sets of source materials generate the output. These base texts include the author's own poems and statements in poetic form, which he refers to as "modal elements," previously generated collocational work, and an essay titled "Critical Theory." Besides indexing the constructions, the opening screen provides useful information, such as links to "Introductory & Explanatory" materials, an index, the "Given Texts," and instructions on how to use "this book."

The introductory materials introduce hologography, the Indra's Net project, and describe the contents of the publication. Here Cayley discusses the constraints he has imposed, properties he sees manifest, and other detailed aspects of the work, such as several possible variations of hologograms, and an elaborate description of "the SINGLE-SENTENCE OR TWENTY-SIX-WORD-STORY ABCEDARIAN OR HEAD-ACROSTIC" and other such ornately titled productions.[29] Cayley provides instructions informing the viewer how to change the course of the reading (by clicking on words) and how to alter the ways in which texts are generated. This latter feature involves a clever and crucial mechanism contrived by Cayley that, most important, gives some input on the manifestation of text to the viewer. As the text is being generated, the position of the mouse determines the likelihood of a collocational jump occurring in the text.

The title piece of *Moods & Conjunctions* operates as described above: base texts are recombined to generate an incessant series of stanzaic texts that are themselves somewhat fragmented but programmed so that speculative—if not plausibly introspective—values emerge in a series of six-line poems with varying line lengths and syntax. In these two samples I requested a medium degree of collocation:

if I use
or rather we avoid
language
as if I could
why don't we
all

of our bodies
particular shapes of my

own another's sculpted
corporality
or to your own
and. (July 18, 2004)

These expressions, drawn from given texts on language and sex, address physical and sensual relationships. Issues involving a person's ultimate detachment from others, the potential for language to be ineffective, and the difference between reading about, or being with, someone else's body become acutely pronounced in these cyborgian utterances.

As previously demonstrated by Kenner, the structures and themes that emerge reflect those of the input text. These fragments made of fragments are an alternative dialogue enabled by the program. Essentially, they represent the text(s) having a programmed yet variable discourse between themselves that is directly conducted by the viewer. "Modal Element 2" makes texts that are composed of the "fragmentary clauses" and phrases prepared by Cayley and shown in the Given Texts (e.g., "couldn't you then you would until you do"). These short phrases are combined in collocational arrangements (as in the previous example) to make nonsensical texts (again, with a medium degree of collocation):

we will
much as you used to
may I
could
because you have
because we how

could we
couldn't we
when can we
while we how I could
why don't we
shouldn't. (July 19, 2004)

Essentially, the output re-presents the given text(s), endowing them with a programmed yet variable discourse—if not intercourse—between themselves that is directly conducted by the viewer. Because the given text is pre-

sented as multiple fragments, it is not a surprise that the output text is wildly disconnected. A reconnection of language occurs in the shuffling of words, which almost communicate something in the compilation of lines but are not able to make a complete articulation before a new line, or form, of thought is presented.[30]

In reading Cayley's texts a viewer may migrate between the nonlinear and linear at his or her own discretion. Alternating between the two, balancing sense and (what is close to) nonsense, is perhaps the most effective way to use the program, as it modulates the surprising utterances with ordinary articulations asserted by the core text. The sense of surprise—not knowing what formations of language the program is going to issue next—is one of the great strengths of this work. While all of the words are simple, they are able to reflect and portray a range of meanings in their perpetually shifting context. Cayley's program presents an entirely different sensibility of text altogether. Unlike the simpler, slotted configurations used in many text generators, the appearance of words and phrases—though sometimes quite close to the original—are extremely variable and do not follow a preset pathway on each activation. Basic words, in their reconfiguration, have the ability to present unexpected and complementary additions as they arise in the perpetuation of language, as they do above.

The four presentations in *Moods & Conjunctions* that feature two visual planes all appear in a similar manner, with a single word first appearing at the bottom of the screen, followed by a stanzaic text that uses the letters of the initial word (in order, one letter per word) to establish its vocabulary. Occasionally, an abstract line drawing is inserted that appears as if it has been scratched onto the screen. These highly performative texts challenge the viewer to establish a method of reading the effusive output. In the sample below, single words that appear at the bottom can be read as a type of metatext that encapsulates the passages that the program is producing and also becomes a part of the running narrative:

approac**h** forg**e**t
unde**r**lying d**e**eper

here

realization**s** **u**nderlying
app**r**oach **e**xpress
sma**l**l underl**y**ing

surely

v**i**sions intimacie**s**

is

re**a**lizations

a

resolve dr**e**ams
re**f**ashion br**i**lliancies
u**n**derlying r**e**solve
intim**a**cies dr**e**ams
co**n**scious forge**t**

refinement

realizat**i**o**n**s **f**orget

of

bri**l**liancies **a**pproach
refashio**n** nothin**g**
unique w**a**king
underlyin**g** **e**verything

language

refash**i**on **f**orget

if

which **e**verything

we

brillia**n**cies uniqu**e**
visions und**e**rlying
d**r**eams

never

waking d**r**eams wak**i**ng
realiza**t**ions d**r**eams

write

t**r**a**c**es e**n**joy
ever**y**thing silen**t**
approac**h** b**r**i**l**liancies
wak**i**n**g** nothin**g**

anything. (July 19, 2004)

The single words that appear first, at the bottom of the screen, are drawn sequentially from one of the given texts; they appear both to proceed (by coming into view first) and follow (remaining at bottom after the collocation has transpired), a condition that highlights their dual role in the formation of expression. Successive screens can be read either as individual units of poetry or as a serial text. Themes of the given text are presented in condensed, abstract, and oblique form as the collocations transform the language into a kinetic doppelganger of its original formulation. The dualistic works presented in *Moods & Conjunctions* explore, as did earlier exhortations of the program, the strictures and constraints associated with the themes of sex and language established in the given texts. Although it may appear that the viewer is getting a diluted version of these texts, they are, in fact, enlivened and extended, always changing (even as they revolve around the same axis) and represented anew. The random insertion of graphical images into the collocations at unpredictable moments also serves to impart alternative, unexpected information. In the introductory materials Cayley acknowledges that the hologographic process is "unlikely to produce anything like natural English" (*Moods & Conjunctions*). His statement is correct, although the abstract expressions produced sometimes compare syntactically with Dada and other experimental forms such as Language poetry, whose deviations from traditional modes of language serve to provide a reasonable poetic context for the work. Cayley indirectly asserts his perspective on innovative forms of expression by inserting a quote from Ezra Pound's "Canto XCVI" as the epigraph to "Critical Theory": "If we never

write anything save what is already understood, the field of understanding will never be extended. One demands the right, now and again, to write for a few people with special interests and whose curiosity reaches into greater detail."

Later titles by Cayley, "*Leaving the City:* Indra's Net V" (1995), *Golden Lion:* Indra's Net IV (1994), and *Book Unbound* (1995) employ similar collocational techniques and produce results similar to those found in *Moods & Conjunctions,* with slight differences.[31] All of Cayley's titles in this era utilize similar methods, processing given texts into a synthesized expression that effectively blends them into one verbal unit. Each project involves identifying individual documents that are of a kind with each other and then combining them together—via the calculations of a computer program—into a new text.

Unlike the generic interfaces Cayley works with in other titles, *The Speaking Clock* has a more visually complex scheme and, unlike the other titles, uses the time of day (as well as the month) on the computer's clock to arrange the language in motion at the center of the screen. To achieve this effect, Cayley devises a system that establishes a correlation between the numbers one through ten and the most common letters in his 365-word given text. The given text is broken into four sections of about ninety words each that, according to the author's notes, represent "seasonal" quarters of the year; it appears around the circumference of the clock at the edges of the screen. Each of the sections is further broken into three segments (separated by Roman numerals), which are read across the screen (i.e., on both sides of the active "clock" mechanism). The writing is inventive, discursive, without punctuation, and often has a serious tone; most of the segments directly mention time or clocks, as in this sample:

I each shaped breath tells real time is concealed
beneath the cyclical behaviour of clock and time
piece lost warmth true cold spelt out
and no breath like this last
even as.

Sections of the poem often refer to these subjects indirectly, by referring to cycles and the passage of life, as in the ninth segment ("July–September" screen):

IX would she
become more conscious of mortality if she were denied
the sense that she constantly returns
to a previous state of existence
with the same name in the cycle.

Section IX uses the concept of "entropy" as a symbol that indicates passage of time. It is possible to read the given texts vertically, though viewers who do so will encounter an increased level of fragmentation. For example section IX, read vertically, becomes:

IX would she
conscious
if she were denied
she constantly returns
of existence
in the cycle.

In some respects this text actually resembles some of the output from Cayley's earlier programs; viewers who are tolerant of such abstraction will find many ways to approach reading *The Speaking Clock.*

The program selects words from these texts that contain the letter that corresponds with the momentary time and date; the word is placed in sequence in the area in the middle of the "clock," with the signifying letter emboldened.[32] At the center the words do not change at once (i.e., one word does not instantly replace another word); instead, the letters that form the words are perpetually transformed letter by letter as time passes until the new word appears. Figure 3.14 shows an example of text generated from springtime (month IV on the calendar).

The outer rim of text is also a text; thus there are two layers of language to absorb; one is static, and the other is kinetic. The most difficult thing for an uninitiated viewer, who has not been given instructions, would be establishing the relationship between the bold letters and the representation of time. This of course is ultimately not very important, as it is unlikely that anyone will use the poem to tell time. Instead, the viewer absorbs continuously generated output made using "quasi-aleatory" procedures (Cayley, email 1996). Cayley, according to a 1996 email, explains that his motivation for creating the piece arose from two questions, which are contained in *The*

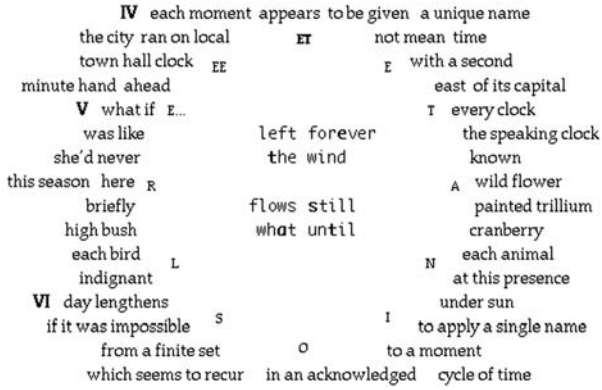

Fig. 3.14. John Cayley. Screenshot from *The Speaking Clock*. Courtesy of the author.

Speaking Clock as part of the given texts: "What if it was impossible to apply a single name from a finite set to a moment which seems to recur in an acknowledged cycle of time? What if it was impossible to apply the word 'dawn' to more than one single instant at the beginning of some one particular day?" (email 1996).

Given the persistent regenerative aspects of Cayley and Rosenberg's work, where content is determined from "given" texts, or pools of text, their electronic poetry is not so different from the initial processes in written or even oral poetry. In both digital and nonelectronic work, selecting the words and arranging them in a textual field remains primary. The digital poet then has the opportunity to program the selected and arranged words to achieve new poetic effects. From selection to arrangement to programming, Cayley's work embodies an inherent beauty. He is adept at providing groupings of words—sometimes original work, sometimes translations and adaptations of other writings—which represent themselves in remarkably poetic and sensitive ways. The text, while sometimes asyntactic, is never nonsense; it is inventive in terms of its expression, a combination of fresh words and phrases appearing in conjunction with recycled text. Technically speaking, the HyperCard stacks of words are set up in an order, which is then subverted by the programmer by making links from an index and by the collocational or randomizing device that algorithmically establishes the succession of words that appear based on their alphabetic structure. Multiple texts are spliced together, and the words themselves do not change; the reader's order of reading them does. The hologographic transformation creates mar-

velous text recycling the given texts, recycling the words anew with each reading. The linking systems employed in the generative sections of *Indra's Net,* or the interactive areas of Rosenberg's work, are conceptually and practically unique and unconventional. Cayley's works "run" on their own, generating texts for the reader who can interact with the program but does not choose pathways between words directly in the way that she or he might choose a pathway through the disparate areas of a WWW site or a work of hypertext fiction. Cayley's work from this era self-consciously springs from several contemporary poetics movements, including Fluxus, Oulipo, experimental "cut-up" and machine-generated work, and Language poetry. To provide his metastructures, however, Cayley has turned to an Eastern cosmology to establish his foundation. He explains this theoretical orientation in the introductory and explanatory materials in *Golden Lion:* "Indra's Net is 'a network of jewels that not only reflect the images in every other jewel, but also the multiple images in the others.' In Hindu mythology, this net hung in Indra's palace and had the power to bring anything into being. In Chinese Buddhist thought, and especially in the teaching of the Huayan school, it was used as a metaphor for universal structure and exemplified the 'interpenetration and mutual identification' of underlying substance and specific form." This approach to conceiving his grouping of works does not suggest that they are interchangeable, or that they function in the same manner, but that they complement each other. Cayley's description of the processes involved with creating *Golden Lion,* in the essay "Machine Modulated Poetry by Potential Literary Outlaws," illustrates the general constructive principles that are used to unify and support his initiative: "Indra's Net pieces employ generative algorithms and semi-aleatory processes and the composition of the algorithm is seen as an integral if normally invisible part of the composition of the piece. One of the unique facilities offered by the computer in this context is the ability to set up a feed-back loop. 'Experimental' texts can be generated and the results reviewed quickly and painlessly enough to allow the processes to be modified and improved." Cayley's works—in operational mode—project kinetic dynamics. In many of the titles an alterable element allows viewers to control certain variables by engaging with the text. Cayley's works portray a strong degree of indeterminability, and though it is clear that he has shaped his own poetics, he directly refers to artists who have previously engaged with such methods, including Burroughs and Gysin. Transience and intransigence alternate through his projects; texts steadily perpetuate themselves after being acti-

vated by the reader, who, by engaging the program, reorganizes multiple fixed texts into a series of fleeting formations. The output, if transitory, is not superficial; output texts are sophisticated, if imperfect, and command careful perusal as Cayley sets up a series of operations that make the links fluid, almost transparent.

Constructive Models

By definition, constructive hypertexts are collaborative. Although a few collective efforts were made, poems that can be considered constructive hypertexts (in Joyce's sense) are not a predominant force in prehistoric works. This is surprising, since digital poetry has unquestionably shown the capacity to promote collaboration: Brion Gysin's permutation poems exist in digital form because of the intervention of a programmer; Margaret Masterman and Robin McKinnon Wood pooled their knowledge to create automated haiku, and graphical poems emerged as a result of collaborations between Lillian Schwartz and Ken Knowlton. The *Alire* and *Little Magazine* editions present multiple joint efforts; the *Internalational Dictionary of Neologisms* was the product of dozens of contributors. Artists, writers, and programmers working together to conceive and produce digital poetry is not a novel approach to composition, though this mode of implementation has, finally, been less than profuse. Because of the complexity and aesthetic density enabled by new media technology, digital poetics almost inherently calls for a collaborative methodology: ideally, artists with expertise in particular areas would work together to formulate digital works programmatically. Frequently, however, individuals produce compositions. Further considerations of the potential for collaboration are especially relevant at present, as constructive tools such as wiki, bulletin boards, and chat rooms are convenient mechanisms that enable artistic collaboration despite geographical separation. For now only a brief report on constructive hypertexts can be offered.

Dictionary Mode

Dictionaries of various types are a component in many works of digital poetry, but the *Internalational Dictionary of Neologisms,* organized by mIEKAL aND, is a different type of interactive literary publication altogether. In this production, which began as a "mail-art" concept in 1985 (first HyperCard version, 1987), authors collaborated to create a database of invented words

that were indexed so they could be accessed and selectively compiled by other users. The dictionary itself did not generate words or definitions; contributors from around the world provided these elements, which were assembled into hypertext format. The opening interface presents several choices. A "wordmation" button on the opening screen activates a preproduced morphing text made with neologisms that are visually stitched and cyclically blended into each other. Other buttons lead users to the index of the words in the dictionary, contact information for the authors, and a "MultiFont info" page that provides instructions on how to program special characters into words (as a way of inviting international, multilanguage contributions). The "alphixation" button leads viewers to an interface with the words contained in the dictionary (fig. 3.15).

The dictionary entry and definition are shown, as are the name of the word's contributor and date of contribution. This screen also contains several other interactive mechanisms: the interface enables users to move between definitions using arrow keys or write comments about the word; a "TextCatch" button copies selected definitions into a separate file; a "namepopper" button compiles individual neologisms (without definition) in a separate file for later use; and a pronunciation button provides a key for phonetically sounding out international characters and typographic accents. According to aND the scissors icon that appears on the left is actually a utility that he, as the programmer, included in order to facilitate entering multiple entries by the same author (i.e., it is not used by the viewer to cut text, as it might appear) (interview). An early version of the program available on the WWW for download via *TextWorx Toolshed,* circa 1995, features 425 words. A random section of the index includes words such as *autonascimortalis, spermatasthenos, thalamophobia, umbradermis, semiocrasis,* and *somapathy.* A later online version of the piece, a feature of aND's *Joglars* site housed by the University of Minnesota, contains 1,936 words as of a 2004 reading. The project now has its own WWW site (<http://www.neologisms.us>), and as of August 2004 contained more than two thousand words. Mark Palmer comments about the work included on the *Internalational Dictionary of Neologisms* diskette: "This kind of wordparticle-concatenation neatly emphasizes and affirms within itself the non-centralized nature of the activity overall." aND has included words produced by his PataLiterator program in the dictionary and has collected contributions from around the world (via mail, email, in classrooms, and by other methods). Words in this dictionary can be used as a language with which to write

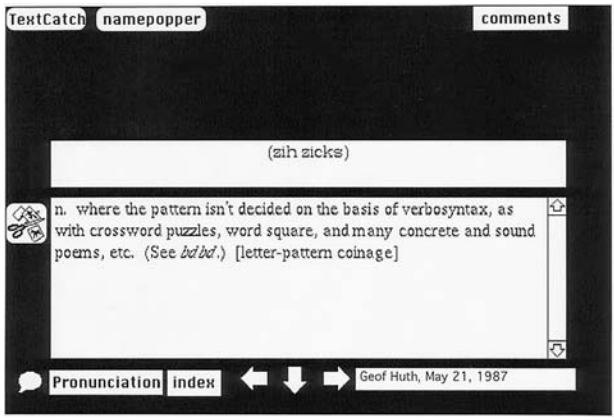

Fig. 3.15. Geof Huth. Definition for "xyzxyx." Contribution to *Internalational Dictionary of Neologisms* (Xexoxial Editions, 1987).

new poems, though perhaps the next step in furthering this human/digital work could be to enter its words into a text-generator database. The program is specified as, and performs singularly as, an interactive dictionary of invented language, though its contents could be used to generate poems. This model builds a communal knowledge through original expression, as multiple contributors insert their own content within a preexisting formal architecture.

Multivocal Participation

Deena Larsen's *Marble Springs* (1993), illustrated by Kathleen Turner-Suarez, uses a combination of HyperCard and Storyspace to map, link, and display histories, genealogies, and relationships of a fictional town (Marble Springs, Utah) and its citizenry.[33] The project is based on Larsen's research on a North American mining town that thrived for about fifty years beginning in 1870 but has since vanished completely. In the prologue the narrative is posited as being "old journals from the Ladies Aid" found in "an ancient traveller's trunk." The author ("writer within these writings") of the "secret webbing of words" found on "crumbling scraps of paper" lived in the town during its heyday. In fact, Larsen has derived the verbal material from actual documents written by the women of Marble Springs. Because "only sensational or rare doings of the fairer sex were recorded in newspapers and in the annuls of history," Larsen writes that she conjured the lives of the women

in Marble Springs by turning "to the diaries and letters the quiet sex left behind." Verbal remnants left by the women are presented in poetic form; each of these poems concerns one of the residents, and Larsen has added her own adornments (including occasional sound clips of gunfire, saloon music, etc.). She also leaves room for the viewer to add his or her own connections. To this end the viewer is informed, "On any poem card, you can add your notes in the margins and in the bibliography. On blank poem cards where stories have not yet been told, you can add your story to the text page and relate the biography of the character in the title page"; the instructions on how to do so are provided by a "How to Write" screen, which proclaims, "*Marble Springs* lies like half-empty promises, wanting to be written."

Despite Larsen's intricate blend of methods and the fact that her project layers the text with different types of information, learning how to use or navigate through *Marble Springs* is not difficult. When *Marble Springs* is activated, a pop-up box immediately instructs the viewer to "Click on any box, graphic, or underlined word to uncover what is there"; a prologue page—which links to "Author," "History," and "Help" sections—appears. Buttons appear in the margins of every screen; different icons facilitate the exploration of more than 160 screens of text and imagery. A key is provided, and every screen is clearly marked. Besides making links to instructions, or allowing viewers to link to the previous or next card in the stack, buttons also appear that enable the direct viewing of indices of characters, their connections, or a directory of the poems. The viewer has several options on every screen, including adding her or his own connections and content to the work. Most screens feature hand-rendered line drawings. Some emulate genealogical charts; others are maps of the Crystal River Valley (fig. 3.16), of the town of Marble Springs, or of the Marble Springs graveyard. Viewers can use any of these visual devices to navigate the materials. The rudimentary quality of the graphics adds to the "folk" nature of the piece and is an appropriate aesthetic for the representation of a rustic town during western expansion.

Clicking on Marble Springs brings a map of the town, houses that "reflect the memories of those who lived there." Each screen primarily contains verbal materials in a fanciful frame (not shown in illustration). The poems are each accompanied by a drawing, which is also a button that calls a new page to the screen. *Marble Springs* can be read by clicking through the images that appear to the right of the poem, though they are often programmed as a self-contained cycle; screens that contain poems often con-

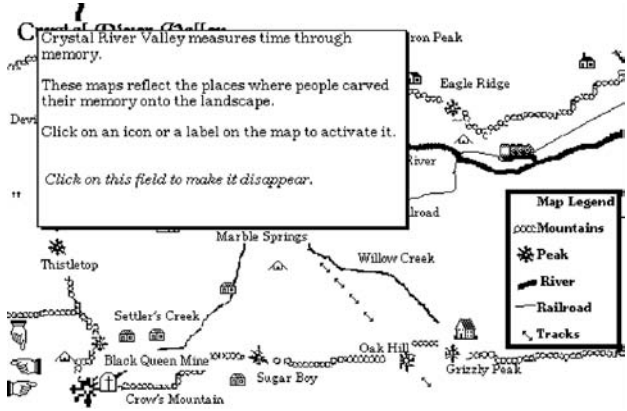

Fig. 3.16. Deena Larsen. Screenshot from "Writing Instructions," *Marble Springs* (Watertown, MA: Eastgate Systems, 1993).

tain more than a dozen possible moves. The poetry is neither experimental nor expansive; as prose turned into poetry, it is relatively nondynamic but functions artfully and suits its purpose.

In *Marble Springs,* hypertext appears in typical and unusual ways. Many words are underlined to indicate a link-node connection, and the images are often links or mapped with links. Larsen has also included numerous unexpected links. For instance, clicking on the title of the "Help" page activates a pop-up box that contains a contemporary quotation from one of the character's great-granddaughters. The (unmarked) title of the "directory of poems" brings an unexpected poem:

> Handle the names
> gently,
> as if
> they had the power
> to conjure life.

At other points, the pop-up boxes prompt readers to select which character they would like to meet. Multiple types of links—to maps, to genealogical charts, and other texts—are made throughout the production. If no link is available where the viewer has requested, one can be added: another pop-up box will appear that states "no poem is attached to this" and of-

fers the viewer the option to write one. In each of the windows the viewer can move between the passage and the card that contains the information about its author, make her or his own marginal comments, or view any relevant bibliographic materials. The text's participatory objectives are foregrounded in the "How to Read" section of the project, which states, "*Marble Springs* breathes through a symbiosis between the reader and text." Borrowing Aarseth's term, such a "textonic" feature allows readers to add to the text, to potentially play a role in it. This aspect of Larsen's work extends beyond the viewer's individual copy, as she invites anyone to send additions that may be incorporated into the piece. In summation, the poetics of this piece are mirrored by the content of one of the idiosyncratic pop-up boxes: "Chance encounters: the trespass of others into your designs." Larsen's work is a fine example of digital poetry based on a cultural history of a place and an archaeology of its people, even if far removed from their original context.

Observations

As poets continued intensive experimentation with computer-generated, graphical, and video works, another important type of digital poetry crystallized with the availability of hypertext. From the beginning Nelson envisioned a computer network in which all of the world's texts (in all media) were interconnected into one grand document via computer networks. Though Nelson never directly addresses poetry, it is telling that he names this hypertext vision *Xanadu* (referring to the Coleridge poem "Kubla Khan"). This thematic connection is an acknowledgment that the dynamics of poetry are active in the "new literature" imagined by Nelson in "Opening Hypertext" (43). Within a few years poets became actively involved with—if not a vital component of—this developing form of expression.

By the late 1960s Nelson realized the problem was not as much the creation of a singular organizing construct, or the individual hyperunit, but more a project of finding multiple conceptions of organization enabling each component of a text to coexist equitably. Nelson realized, as hypertext theorist Michael Heim later articulated in *The Metaphysics of Virtual Reality,* a Leibnizian concept that "through a shared language, many discordant ways of thinking can exist under a single roof" (37). The pressing question for Nelson became "how to merge into a coherent and unified literature the many different hypertextual and hypermedia objects being created, and

to comprise these many contributions—created under different rules, with different graphics, with different styles of interaction—into a unified literature, a unifying system that we may all access through whatever machine we use" (Nelson, "Opening Hypertext" 50). For some this meant employing visual maps to organize an otherwise insular work, but obviously a grandiose plan such as Nelson's was beyond the technological infrastructure of the prehistoric period. Nevertheless, the idea of organizing multiple interlinked texts into a single title was influential and led to texts that explored these objectives.[34]

Dozens of authors practiced hypertext and hypermedia poetry during the 1980s and 1990s, many of whose works are not easily categorized. Among the many advantages of the development of personal computers with floppy diskettes (and later CD-ROM and the Internet), digital poems were no longer bound to the piece of hardware on which they were produced (nor, to extend the comparison, the ink of the page on which they were printed). Despite this advancement, these early productions/programs remained largely obscure and difficult to access even when they were produced. Typically, hypertext and hypermedia poems prior to the WWW contained interlinked text and sometimes image files. They are "interactive" in that they often—but not always—require choices made by the viewer; occasionally, as in constructive works, "ergodic" elements are present, as files could be added to publications by viewers.[35] In general, however, a viewer is an audience to the nonlinear, yet insular, preprogrammed texts rather than an active participant in them, a relationship that embodies the most traditional attributes of textuality. Instead of understanding this as an unfortunate condition, I see it as a phase in the early development of the form.

In the "About Reading" section of his hypertext poetry collection *Sea Island,* Ed Falco writes: "Because hypertext poetry is something new, there is not yet a body of literature prescribing preferred methods of reading. Pretty much, you're on your own." His statement falls in line with the liberational aspects of hypertext celebrated by numerous authors who grant themselves license to appropriate available tools for their own imaginative ends. Some works, such as those created with Storyspace, are technically complicated, especially those that fully exploit the capabilities of the program (in terms of mapping and developing one's own system of links). At first, many viewers without prior experience using this type of software may be puzzled and encounter difficulties attempting anything but the simplest form of reading. Over time, however, all viewers should be able to understand how to

engage with these texts. Storyspace's ability to allow readers to create their own links, as well as its "multiple choice," multi-interfaced digital environment, invites a kind of text that will never be read the same way twice, an aspect of hypertextuality that emerges in every work.

I have not addressed these titles' *soundlessness.* Few of the titles discussed above include sonic elements. In part, this undoubtedly results from limitations imposed by circulating literary objects on floppy diskette (which is the case in all of the titles we have looked at). Electronic or digital poetry is not required to make use of every potential form of input and output. Future endeavors in the realm of digital poetry can benefit, however, by increasing audibility in their texts. Hearing the voice of the poet can only increase the impact of the alphabetic text on the reader. In the area of text generators the omission is understandable, as it was a text-only proposition. With many subsequent works in various formulations of kinetic and hypertextual works, the lack of sound implies that it was a low priority, as if to suggest that the "read" word was the most important aspect of the poem, which should be confronted and refined first.[36] Yet the importance of all media is underscored by a passage from Melo e Castro's essay "Videopoetry," which intones that the poet now faces "a complex set of electronic apparatus and their multiple possibilities to generate text and image in color and in movement" (140). Melo e Castro's view implicitly favors visual aspects but equally values the "multiple possibilities," which include sound. That Melo e Castro neglects to consider *sound* as a vital property enabled by computer technology is reflective of its textual status at the time, although a number of audio works without visual components were produced, as discussed in the next chapter. Critically speaking, the fact that most digital poems lacked sonic components inhibited the force of their impact, though clearly this is in part because sharing audio via the Internet, though possible, did not become convenient or fashionable until after the dawning of the WWW. The capabilities of the network environment are only as strong as its technical underpinnings, which with the advent of cable-modem technology, are extremely strong for present-day consumers. Historically speaking, sonic elements were not privileged as requisite components in works of digital poetry, but the voice, and vocalization of poems, has always been central to poetry.

Despite, or perhaps because of, the complexities of programming such works, the dynamics in nearly all the work introduced above are static in that they perform and appear the same way in each viewing. Kendall's *A Life*

Set for Two, where the reader is allowed to set the "mood" of the piece, which is further altered by the program, is an exception to this condition. A few of the pieces on *The Little Magazine* CD rely on indeterminate mechanics, but most of these works are predetermined and linear. Works like John Cayley's involve time-based events on the screen, though works are fixed and presented for the viewer to examine. Little more participation occurs in the reading of most of these digital texts than in reading a novel. Many of the links we see in these titles are standard link-node mechanisms. Few works enable viewers to add their own information. Coordinating and producing unified multimedia files is immensely difficult, though the end result is often very basic and less than remarkably interactive. Advancements remain to be made in handling multiple forms of digital media in such a format, so that the viewer is more a participant in the text than an audience to it. Such endeavors will be complicated, and their effects cannot be predicted, but when they are realized, contemporary textuality will reach a new level.

Most of the works discussed above are fair representations of contemporary hypertext. Measured by the standard of Ted Nelson's initial vision of the form, however, these works can be viewed as a form of microhypertexts, as there are no larger structures interconnected with them. Most of the diskettes and CD-ROMs produced in this period were isolated units, disconnected from everything except their own files and file structure, and some titles are essentially no longer viewable because of changes—so-called advancements—in technology. Many early hypermedia works are likewise self-contained and are hypertextual in that the reader's choices/input determines what order the preconstructed content is read. In most cases hypermedia titles are not "hyper-" but multimedia (text/sound/image/video) synthesized by digital processing. A purist (like Nelson) might argue that these works are minimally hypertext or hypermedia or would only loosely define them as such. In any case they are the first hypertext/hypermedia poems, formations of nonlinear expression achieved by writers and artists who were interested in the form and had computers—still a very new tool—to work with. My point here is not to nit-pick the terminology—it is perfectly acceptable to have a broadly interpreted sense of hypertext—but rather to insert a reminder that a higher level of hypertext networking, mechanical intertextuality, and interactivity has been envisioned and could be pursued. Given the growth of the Internet and the popularity of the computer, it is likely that significantly more sophisticated—what Nelson in *Computer Lib/Dream Machines* calls "intertwingled" documents—will be produced, in

which the viewer can make any online text into a hypertext, customizing it to his or her specifications (2). To a moderate degree this already occurs on the network, especially if a viewer reads WWW texts in conjunction with a search engine and multiple windows. Though a viewer is unable to edit Flash movies, a currently popular form of transmission of digital poetry, many other forms of text (e.g., .html or .doc files) may be easily downloaded and reproduced by a viewer. The WWW appeared just a decade after the appearance of the first poetic-artistic publications on the Internet, giving poets and producers a more capable multimedia and hypertextual environment. The creative explorations discussed above, while rudimentary, should be valorized for establishing a practical foundation, though the works should not be regarded as the only way to implement the form. It is impossible to predict the visibility and location of hypertext a decade or two hence, though it is reasonable to expect that the network will expand to include more texts designed to give readers multiple ways to experience them.

As the computer "extends the text to encompass the world," Joyce, in *Of Two Minds,* sees new multiplicities at the doorstep of education and other institutions (5). The implementation of his hypertext poetics—"a weave, a blur, a ripple, a stream of successive, mutable fields, and, like teaching itself, a practical work"—allows an individual (or group) imagination to extend outward (7). Collecting a wide span of concerns from the margins and centers of culture to be exposed in manifold ways, this interconnected broadcast device is able to enhance, accentuate, and powerfully alter readers' experiences. Yet the high idealism envisioned by many has not made a powerful impact, despite the growth of the WWW, or lodged itself in the creative imagination of the larger public.

4
Alternative Arrangements for Digital Poetry

In addition to the major areas of development described previously (text generation, visual, kinetic, hypertext), poetry was treated by several other computerized applications. To divulge a more complete spectrum of poetry presented in digital formats in the era before the WWW, I will address those methods here. Though I will not devote quite as much attention to each of these topics as I have to the developments above, I would be remiss not to address Internet publications, digital projects conducted in physical space, and audio poetry, all of which transpired during this period. I will therefore survey and briefly introduce these other depictions that were investigated in the years preceding the onset of the WWW. These formations are somewhat marginalized by their placement late in this review and may seem abbreviated in comparison to previous explorations, but such conditions are mostly a result of their appearance in later years and their newness rather than their relative significance or contribution to the genre.

Network Writing Initiatives

Anna Couey's essay "Cyber Art: The Art of Communications Systems" (1991) claims that the very first online artist's network was a Canadian enterprise named ARTEX, an "email system" founded in 1980 by Robert X. Adrian. The members of ARTEX engaged in the composition of texts as a group and operated as a conduit for international arts news. One of the communal projects, *La plissure du texte* (The Pleating of the Text), organized by Roy Ascott, was, according to Couey, "the collaborative writing of a fairy tale, produced by nodes of artists in Europe, Canada, the United

States, and Australia." In this example artists with a range of creative backgrounds, joined by the network, worked together to produce text. This type of network conferencing system was used by poets for a variety of purposes that are described below.

Concurrent to ARTEX, Fred Truck and Carl Loeffler began to develop the Art Com Electronic Network (ACEN). This construction was launched in 1986 on The WELL, a dial-up Bulletin Board Service (BBS) that hosted a number of different social, cultural, and artistic conferences.[1] The BBS enabled these conferences to manifest as virtual bulletin boards for writings, digital files, and interpersonal and communal dialogues. Couey describes ACEN, with which she was closely involved, as "a newsstand of online art periodicals; an Electronic Art Gallery of interactive works programmed by artists; a Graphic Art Gallery of downloadable graphics by artists; an Electronic Mall with an art bookstore, art video store, and art software store; art information base; and bulletin boards"; guest artists also edited a monthly electronic magazine called *ART COM,* which became available on the Usenet via alt.artcom.[2] The artists involved with the network had a range of backgrounds—though only a few of the artistic productions directly relate to digital poetry, one can find similar approaches and attributes. For instance, the ACEN forum initially published John Cage's mesostic poem "The First Meeting of the Satie Society" and a project called "In the Heart of the Machine," which was an ongoing novel (conceived by "Dromos Editions") calling on readers to submit biographies to create new characters. Other poetic works that circulated via the ACEN include Judy Malloy's "Bad Information Base," a bulletin board that, according to Couey, "invited users to contribute wrong, bad, silly, subject to misinterpretation information." "Das Casino," by Truck and Loeffler, started as a discussion regarding virtual roulette, in which a random number generator determined winning bets. "Das Casino," reports Couey, "evolved into collaborative theatre as participants developed characters for themselves and described events which took place in Das Casino." ACEN functioned predominantly as a community of collaborators who often ventured beyond the realm of their own creative expertise as an ensemble of artists working together, as opposed to being a spotlight for individual works. This community operated vigorously for more than a decade and fell silent in 1999.

In "Welcome to the United States of Poetry!"—the introduction to the anthology printed as a companion to The United States of Poetry video series—Bob Holman briefly introduces the burgeoning relationship be-

tween technology and poetry in the early 1990s. Holman sees online poetry communities and publications, then forming around virtual centers, as legitimate counterparts to local scenes, institutions, and other experimental literary movements. He specifically mentions schemes such as the Telepoetics project, founded by Merilene M. Murphy, which organized online events that occurred as low-fidelity video teleconferences and whose Internet portals served as an informational resource for online poets. Holman also cites Sherry Rabinowitz, Kit Galloway, and Dan McVeigh for their involvement with the digital transmission of online poetry events, often in conjunction with Telepoetics. Rabinowitz and Galloway are artists and cofounders of the Electronic Café International, based in Santa Monica, California, who began to explore advanced telecommunication in their works in 1980 with a bicoastal telematic video installation titled "Hole in Space," which was also discussed in Couey's "Cyber Art."[3] The Electronic Café simultaneously transmitted live projections in New York and Los Angeles, putting viewers on both ends into visual contact. McVeigh, according to Holman, devised "Senator PoBot," a wireless robot so named because it liked making poetry about the Information Superhighway (10). Built by Canadian Graham Smith, Senator PoBot was 5′5″ tall, with a video screen on its head that displayed the face of whoever was navigating and speaking to an audience through it. According to the *Electronic Café* WWW site, PoBot could be remotely controlled using ISDN technology by anyone with an "H.320 videoconferencing capability and a telephone tone generator."[4] These productions, while divergent from previous examples of digital poetry, further illustrate the range of visual and verbal exploration invented by artists in the pre-WWW era.

Email and listservs (subscription-based discussion groups that focused on agendas and topics established by members) were used to enable exchanges about and presentations of innovative poetry. In 1993 and 1994 both emerged as tools to conduct poetry and discussion about poetry (digital and/or written), with the advantage that transmitted documents could be archived on the Usenet (see below). This type of focused online discourse regarding poetics was initiated when Joe Amato established *Nous Refuse,* one of the first discussion groups focused on poetry, theory, and electronic media, as an email list in January 1993. Members of this predominantly academic group conspired to present and discuss "online writing, scholarship, manifesto, fiction, poetry, what have you" (Amato). Dialogue among members of the group was often intense but short-lived, in part a result of the

formation of so many listserv discussion topics, such as "ht_lit" (hypertext literature), CW-L (writing and computers), HUMANIST, and TNC (technoculture), just to name a few; several serious Usenet groups, such as "alt.etext," "alt.hypertext," and several writing-oriented groups were also active.

One of the largest and most active poetry-centered listservs at this time was "POETICS," a "private" listserv operating out of SUNY-Buffalo and (nominally) moderated by Charles Bernstein.[5] In its early period, some of which is chronicled in the volume *Poetics@*, edited by Joel Kuszai, a mixture of older and younger writers rhapsodized and conversed in semiformalized (though sometimes very formalized) dialogues; sometimes the exchanges were profound, at other times utterly dysfunctional. At times the discourse was academic, and at times poetry and poetics were creatively addressed by dozens of participants.[6] Many insightful exchanges took place in this arena, including voluminous contributions by profound writers such as Ron Silliman, Don Byrd, Ben Friedlander, Juliana Spahr, Steve Evans, and James Sherry.[7] Another focal resource for digital literature, ALT-X, began as a mailing list in 1993 that brought innovative contemporary writers into contact with one another. The list evolved into a Gopher site (April 1994) and then a WWW portal (October 1994) that has grown to house several online initiatives.[8]

The conferencing, BBS, email, and listserv systems described above were largely (though certainly not always) focused on the discussion of topics rather than on the composition of works. Significant possibilities for the circulation and documentation of poetry gradually began to develop alongside the proliferation of PCs in the late 1980s and early 1990s. For instance, another type of Internet communications system altogether, given the name MOO, also became a location for the presentation and collaborative composition of a few poetic works. MOO, which stands for MUD Object Oriented programming, combines the Internet's Multiple-User Dimension (MUD) system with an object-oriented code that permits the construction of a dynamic textual platform (though it does not permit the inclusion of visual images). In the "virtual reality" or parallel world of a MOO, many people connect to a common electronic database and are able to create their own "space," objects, characters, and dialogue that appear on the screen as descriptions or words in ASCII (plain) text. In a MOO one also navigates through digital constructions along with characters and objects designed and directed by others; these objects often include "bots" (derived from "ro-

bots"), which are programmed to automatically interact with other users without human direction (beyond being programmed), a dynamic that adds to the interactive and unexpected vigor of these spaces. During the first half of the 1990s, hundreds of MUDs were used for a range of purposes by researchers, teachers, gamers, and other techno-thrill seekers. MOOs are a textual tool primarily—as chat rooms would be later—used socially, yet they are also places of creative discovery in which narrative and forms of personal expression and online communities can be developed in virtual space. MOO space became a popular subculture, though little of its creative content has ever reached the printed page. Its creative potential, however, has always interested me and provided the inspiration and location for several projects. While it can be said that many, if not all, MOOs engaged in poetic activity, most of the text involved dialogue, descriptions of objects and places, and brief textual interventions programmed and inserted by users.

"HiPitched Voices," a women's writing collective, produced the first concerted efforts of collaborative writing that I encountered in a MOO. In 1994 Carolyn Guyer and other participants created a Voices "wing" of the *Hypertext Hotel* MOO, housed at Brown University, which was specifically dedicated to hypertext writing.[9] Authors involved with "HiPitched Voices" explored hypertextual writing online in real time, in distinct contrast to previously contrived approaches. At this site, as at other MOOs, a user assumes a character name and identity and, in addition to interacting with other users in real time, can create (via object-oriented programming) a virtual space, which can be interconnected with spaces built by other participants. In this particular example successive groups of students collaboratively built a virtual structure that satisfied the initial metaphor of being a "hotel," to which Guyer's project, along with an online version of David Blair's video *Wax* were added. Guyer, in a retrospective essay titled "Fretwork NOTES," reports that the work was a "free-ranging hypertext" that was "arrested in process" a year after it began by the appearance of the WWW. Furthermore, Guyer explains that most of the writing created at the site was lost in the process from being transferred from a MOO environment over to a WWW-based platform. Reflecting on the work that was accomplished by the group, Guyer writes, "The writing done in this project was not like poetry slams which continue to be practiced in other places on the Internet. The Voices MOO hypertext was more varied in style, and for the most part, less immediately spontaneous. Because of access limitations, most of it was written

offline and then added to the hypertext online. Spontaneity was more represented by the making of links by readers and writers, which had the effect of actually changing the form and meaning of the work" ("Fretwork NOTES"). Though the efforts of the authors involved with the Voices MOO were thwarted shortly after they had begun, the project hypertextually advanced the type of work a group of writers can do and foreshadowed later endeavors such as interlinked blogs.[10]

Before the Voices MOO appeared, I had already used a larger, highly populated MOO to compose dialogical texts that were used as a basis for performances of, and were eventually published as, poetry. In 1993, in communion with another poet and close associate, Roddy Potter (whose MOO name was Mineral), I participated as an interactive character in the LambdaMOO community, an environment described in Julian Dibbell's *My Tiny Life: Crime and Passion in a Virtual World* as "a very large and very busy rustic mansion built entirely of words" (11). I made transcripts that logged all of the activity and encounters of each session, which appeared, Dibbell writes, as "a kind of slow-crawling script, lines of dialogue and stage direction creeping steadily up your computer screen" (15). Potter was much more involved with the MOO, where he built his own space ("The Idea of Switzerland") and formed close relationships with other users. We regularly traversed different areas of LambdaMOO, engaging each other with personal news and discussions about poetry, as well as interacting with other users who joined our conversations. In 1994 the online poetry/poetics magazine I assembled at the time, *Descriptions of an Imaginary Universe* (*DIU*), publicized an online meeting time and place, and several readers and associates of *DIU* attended. The event was unique, and on this occasion only Potter and I logged in from the same location. Part of the transcript, published as a chapbook given the title *The Idea of Switzerland,* serves as an example of a MOO poetics: players drift and dialogue in an unformed manner, even when an attempt is made at organization. I have since intermittently selected sections of the transcripts to publish and present at readings and on the radio with improvised musical accompaniment.[11] The MOO texts that appear in my collections are transcripts of online encounters and exchanges, which include encounters with programmed objects such as "Mineral's poetry pad," documented in my unpublished manuscript "Whereis Mineral," which upon activation (i.e., a user typing "read pad") would present one of Potter's humorous poems, such as "COMPLAINT":

I brung you gifts of gold
and kerosene and beer
I brung you Ne-Mo's banana cakettes
you flung them in the abyss. (116)

The poem, though written for the page, is served well by its context in a virtual environment alongside Potter's ornate and unusual online persona and other programmed constructions, such as robotic bartenders, voodoo dolls, cockatoos, and other objects that randomly interject texts and actions in various public spaces of the MOO.

The methods of delivery and of presentation of text in MOOs are lively and unconventional by any standard yet also reflect some interesting textual traits that usefully represent the act of virtual composition (even in their problematic areas). As a "conflation of speech and act" (to recall another of Dibbell's characterizations of the space), the collective manifestation of language and textual space of the MOO system indicates the type of mutually constructed (i.e., collaborative), interactive literary worlds and publications that are now emerging in networked digital space (28).[12] Since no record illustrating the types of imaginative exchanges and occurrences in this textual realm is currently available to the reading public, this unusual form is unable to receive the attention it deserves from readers (who are possible future authors). I have in recent years tried to make such texts available via printed publication, thinking that they might influence the progression of animated, interactive writing by delivering a significant series of virtually generated documents for wider consideration.

In 1994 Sonic Net, a dial-up BBS in New York City, hosted what was billed as the world's first cyberslam. The event was envisioned to be an approximation of an online poetry slam, though it was a far more textually disordered event than any slam I have ever attended.[13] In fact, the medium did not prove to be ideal for a slam but—especially at its outset—was a lively forum for collaborative verse, as numerous participants typed out lines together in a "warm-up" jam. In addition to the fact that onscreen "downtime" in the event itself (which also occurs in MOOs) is physically and visually dull, the transcript of the Sonic Net "slam" shows that the brief poems presented were fairly homogeneous and often relied on cheap jokes, which work well in live performances (where entertainment is also a factor) but fare less well when read. Nonetheless, the poets' emphasis on sound and

rhyme in these works was proficient, and attempts at graphical representation of language were made (e.g., Regie Cabico formatted a poem about his lover to unscroll line by line as a penis). In the unorganized session the transcript shows great anarchic enjambment, blatant poetic interruption, Dada, improvisatory call and response, humor, and other traits. These blends imbue the text with something particular, an electronic, instantaneous, and impulsive energy that would be difficult to simulate on paper. At moments, conversation and randomness in composition become expansive for the poetry, as two or three different kinds of texts blend into a single expanded expression. The AWOPBOP/Purkinge groups (see below) explored this verbal territory using a local area network during the early 1990s; the one-off condition of the slam often involves a narrative of individuation where the scope and possibility of the poem remain linguistically simple and topically narrow.

In 1994 Kenneth Sherwood and Loss Pequeño Glazier established, with the support of Bernstein, the *Electronic Poetry Center (EPC);* soon thereafter, Glazier became its sole director, a position he has held for more than a decade. The *EPC* was initially based on a Gopher server at the SUNY-Buffalo library; within a year it was converted into HTML files for WWW presentation, where it has been located since. At its inception the site was the most developed and integrated resource for contemporary poetry on the Internet. In the beginning stages Glazier and Sherwood collected journals, essays, and writings by dozens of active poets, a number of whom were producing works with digital media; they aggressively pursued innovative writing to archive and were selective about including materials. For anyone interested in digital poetry, the *EPC* was, and is, more than a decade later, an important site, containing hundreds of essays, electronic artworks, and other online publications (<http://epc.buffalo.edu>).[14]

At least two other archival sites for poetry in the pre-WWW era attended to written forms of verse rather than digital forms. CAPA, the "Contemporary American Poetry Archive/An Internet Archive for Out-of-Print Books," invited poets, or their executors who held copyrights, to place them in their archive. In its pre-WWW iteration the archives included poetry books by Wendy Battin, Charles O. Hartman, William Dubie, Colin Morton, and Robert Pinsky. Volumes archived at CAPA can be read, searched electronically, or downloaded freely.[15] The Internet Poetry Archive, created by the University of North Carolina Press, served as a small-scale resource for big-name living poets such as Seamus Heaney and Czeslaw Milosz. What

this resource—which is not about digital poetry but rather poetry digitized—lacks in breadth, however, is counterbalanced by its rich treatment of an author's work. This archive has always made use of the latest available technology.[16]

Among the primary advantages to working with the Internet were that programs, poems, and other works were no longer bound to the hardware on which they were recorded or by ink on pages. Works could be posted to an Internet site and made accessible to anyone who knew the location or was led to it via a search mechanism. Even so, the predominantly text-based works produced in the early era were obscure and difficult to access on the margins of culture. Only a few artists ventured to explore the alternative forms of textual presentation enabled via the Internet before the 1990s (in the 1980s it was primarily used by scientists and academics to exchange research). By the mid-1990s, when the WWW began to emerge as a hypermedia force, a different attitude altogether had emerged: the Internet was not only a validated but an important means of publication. What occurred in this interim period, between the initiation of the Internet and the advent of the WWW, had historical importance not in terms of aesthetics but as a stage of practice. The rudimentary appearance and apparatus of early network productions is glaring in comparison to the multimedia projections that have appeared on the WWW, but such an evaluation is unfair, as the parameters of the network's capabilities grew drastically during later years. Those who endeavored to produce works using the earlier form of the network managed to achieve prodigious accomplishment, especially considering that online text-editing capabilities (and the availability of other tools) were minimal at the time. It is not regrettable but rather exciting that these minimalist productions would, a decade later, be overshadowed because of further advancement in telecommunications possibilities, as works that include sound clips, images, and animation/video became easy to build and circulate on the WWW.

Early Internet "Publication"

Network operations were used in the earliest electronic poetry publications, initiated in 1984 with the circulation of the first electronic journal, *Swift Current,* edited by Frank Davey and Fred Wah. Karl E. Jirgens's essay "A Quick Note on *Swift Current:* The World's First E-Journal" refers to *Swift Current* as "the world's first literary data-base," which heralded "a new

realm of unhampered literary expression." The project, which linked writers across Canada and elsewhere via modem, was brought to fruition using a "UNIX-based VAX 11-750" computer system, communicating with "C" programming language, in operation at York University in Toronto. Contributions were arranged into several sections, including collaborations, commentary, drama, fiction, mail, poetry, and visuals. By the time the project ended in 1990, *Swift Current* contained works by many of Canada's most important innovators. The publication employed an open editorial policy, in which the writers were responsible for establishing content, which was maintained by the editors but could be customized by individuals on the receiving end; readers of *Swift Current* could permanently remove (or add to) contents of materials downloaded without sacrificing the aesthetic integrity of the central database. This aspect of *Swift Current* encouraged, if not invited, participation in the editorial process, effectively decentralizing the producer's own authority by enabling individualized customization of the contents. Jirgens's essay celebrates *Swift Current* for featuring "post-modern formatting, compression of time, instantaneous access, economic freedom, blurring of audience/author borders, de-emphasis of artist's authority, bypassing of hierarchical structures, and a broader more democratic forum." His assessment is not hyperbolic, as all of these characteristics are potential (and sometimes defining) attributes of WWW-based publications.

The database model of publication, as exercised by *Swift Current*, was not in practice in the early 1990s, and teleconferencing events were infrequent. The model of the online "bulletin board" as seen in the example of the ACEN, was, however, firmly established on the Internet via the Usenet and listservs (the contents of which were often archived online). The first online poetry resources that I encountered at this time were part of Usenet, which functioned as message boards on which any sort of verbal information could be posted by readers whose communication with each other was facilitated via the Internet.[17] Within each branch of the system multiple topics (or "threads") could occur simultaneously, and readers could conveniently access any of the threads. The Usenet, initiated in 1979, was typically accessed via Unix, which contained a built-in news reading program that the viewer activated by typing "rn" or "nn" at the Unix command prompt and choosing which news feed(s) she or he wished to read.[18] Materials available via this mechanism were divided into seven distinct categories: "comp" (computer science), "news" (news network and software), "rec" (arts, hobbies, recreational activities), "sci" (sciences), "soc" (society, politics), "talk"

(debate on a range of subjects), and "misc" (other assorted topics). Many other local news groups also eventually fed into Usenet, designated by tags such as "alt" (alternative views), "bionet" (biology), and "clari" (short for "Clarinet," a commercial resource that gathered syndicated news, to which most universities held a subscription). Generally speaking, the content of Usenet groups was more academic or mainstream than what transpired on the BBS, which was in retrospect more like freewheeling subcultural micro-communities.

On the Usenet the most active site, with regard to the dissemination and publication of poetry in 1993, was "rec.arts.poems," which was (and continues to be) a virtual space in which an unorganized, undirected, online poetry workshop transpires. The forum, which can be accessed by anyone connected to the Internet, is open, driven only by the concerns and works of those who participate in the community. Typically, users post poems that they have written and receive feedback from other users. Rec.arts.poems is and has been historically dominated by novices or developing poets (high school students, college undergraduates) who are eager to have a readership and advice. Occasionally, as in the appearance of the eighteen separate volumes of *We Magazine Issue 17* in 1993 (see below), other poetic interventions occur, though it is primarily an ASCII-based sounding board for individual poets rather than a space for the collective composition of verse. Rec.arts.poems was just one of a large number of Usenet sites at the disposal of writers who were online prior to the advent of the WWW; other examples of resources for the dissemination of creative writing included "alt.etext," "alt.prose," "misc.writing," and "rec.arts.prose." One could also find poetry of sorts archived by users of the popular service provider America Online, though it was not easy to locate from the main interface.[19] My initial view was that such a mechanism could be a valuable tool and textual meeting place if an organized effort were made to collectively *use* this forum for a defined poetic purpose. These mechanisms could be used to educate, inform, and discuss writing in ways not so different from those used in the past by writers separated by great distance. Since then, other conferencing tools, such as wikis (introduced below), have been developed that can be used to compose more effectively. Listservs devoted to an ever-growing range of specific topics are also available, and many of the Usenet groups still exist, even though their visibility and use have declined as a result of the popularity of listservs and other types of WWW conferencing.[20]

Electronic mail became a popular means for the transmission of poetry

publications in 1993, when several poetry publications were circulated using this now-burgeoning apparatus of communication.[21] In spring 1993, seeing that computer networks were becoming a part of everyday life in North America, I felt that it was necessary to investigate publishing texts online. J. A. Polly's "Surfing the Internet: An Introduction Version 2.0.3" (December 3, 1992) had informed me that more than 725,000 host computers were interconnected by the Internet (universities, as well as commercial, corporate, and governmental entities), which linked more than twelve million people in thirty nations. The fall 1992 supplement to the *Amateur Computerist,* titled "The Wonderful World of Usenet News," claimed that more than three million Internet users connected to Usenet News daily. Thus, I decided to produce *We Magazine Issue 17,* coedited with several associates in California and New York, on what were rapidly growing networks. It seemed a reasonable direction in which to take the endeavor of publishing poetry, as it offered the opportunity to share works we had collected and, in fact, to move them quickly across large distances with only a few limitations, mainly having to do with text formatting (bold, underline, and italics were not possible in ASCII) and the fact that very few nonacademic poets had access to the Internet at the time. Between April 14 and May 6, 1993, the publication appeared in eighteen separate editions, most containing a single poem each, which were transmitted almost daily via electronic mail to more than 130 addresses and were also posted to the Usenet (to rec.arts.poems and alt.zines) over the course of three weeks.[22] The nature of the publication was experimental; the idea was to send it out to a large group of people either interested in, or whose creative inclinations were in line with, *We Magazine* (which published its first issue in 1986); I suspected that these readers would then forward the message on to others who would be interested, and so on. The technological apparatus not only heightened the readership but also made an impact on the magazine's contents: Robert Kelly's first submission to the project (volume 3) was a spontaneous poem, "answering the quick thought of Lee Ann Brown," whose poem "Discontinuous Autoharp" had appeared the day before in volume 2 (*We Magazine Issue 17* 3). Within a week after the first edition had appeared, I received a request to include the *We Magazine* transmissions at the University of Michigan's Electronic Text archive, and a few days later similar requests came from the Electronic Frontier Foundation and the University of Arizona; all of the editions of Issue 17 were soon archived at several other Gopher-accessible sites as well (see

below). This venture rapidly became the most widely read publication of the several dozen We Press editions I had coproduced in previous years.

Beyond collecting and selecting materials, the editorial process involved new mechanical preparations. Poems were retyped, converted to text-only (.txt) files, and uploaded (via a process known as "Kermit") to the email (VAX) directory from which they would be sent. A ".dis" file, containing the email addresses of those who were to receive the magazine was also created. Using this procedure, the .txt file could then be sent to hundreds of addresses around the globe in less than ten minutes. Posting editions to Usenet involved a process that included typing six separate commands at the local VAX prompt. Once the first edition was launched, unsolicited submissions—which made up about one-fifth of the overall contents of Issue 17—began to arrive via email, along with many pieces of correspondence (more than three hundred emails regarding the project in its twenty-two-day publishing period). To say that our approach to publishing in electronic space was viable and satisfying would be an understatement. As a means to circulate poetry, the Internet proved itself to be effective and extremely capable. Its limitations—the lack of formatting tools, graphics, and sound—were noted but did not impede the project (and would become, with the rise of the WWW, irrelevant).

A mechanism called the "Internet Gopher" was responsible for wider circulation and presentation of online literary publications and resources, including the earliest version of the *Electronic Poetry Center,* as it enabled a convenient means by which a user could search through materials organized on multiple servers and could be used as a file transfer protocol (FTP) interface. By 1994, programs such as ALEX: A Catalogue of Electronic Texts on the Internet (gopher.lib.ncsu.edu or gopher.rsl.ox.ac.uk) allowed users to find and retrieve the full text of documents on the Internet (by author, title language, subject and title), incorporating texts from various sources, such as Project Gutenberg, the On-line Book Initiative, the Eris system at Virginia Tech, the English Server at Carnegie Mellon University, and the Oxford Text Archive. Numerous publications that originated as electronic mail messages, such as *We Magazine Issue 17* and *RIF/T* (see below), were subsequently repurposed and archived on Internet Gopher servers. Gopher, which only conducted ASCII text, consisted of an extensive series of menus that essentially unified texts stored on any Internet node that had been institutionally indexed. The system made accessible a massive amount of in-

formation, as well as a number of the online journals that had appeared before the WWW. The journals were stored on servers and organized (manually) accordingly. Eventually, several resources in particular were responsible for the compilation of online publications, facilitating access to otherwise disparate texts. The electronic text archive at the University of Michigan (<gopher://etext.archive.umich.edu>) and the Directory of Electronic Journals and Newsletters, organized by the American Research Libraries, both archived numerous poetry publications; the latter attempted to archive at its site every electronic publication available (<gopher://arl.cni.org:70/11/scomm/edir>). Archives at Brown University and the ACEN also contained collections of electronic literary journals.

In fall 1993 *RIF/T,* edited and produced at SUNY-Buffalo by graduate students Sherwood and Glazier, became the first sustained, sophisticated poetry/poetics periodical to be circulated online. Initially distributed via email subscription (and archived on the SUNY-Buffalo Gopher server), and later via listserv, the periodical sought to provide, "a forum for poets that are conversant with the media to explore the full potential of a true electronic journal" (<http://eserver.org/internet/LISTSERVs-in-Literature.txt> [accessed March 8, 2005]). Though its contents include a few writings related to the technological conditions of poetry, the publication served primarily as a vibrant platform for the discussion and presentation of contemporary poetry. *RIF/T,* along with other projects like *Grist,* which also appeared in fall 1993, were significant ventures in terms of asserting the presence of innovative poetry on the Internet.[23] Many online poetry journals, some featuring unique themes, began to appear in the first half of the 1990s. Publications such as *Dogwood Blossoms* (a magazine of haiku), *RedSea, Reinhardt, RUNE HUNTER, Sand.River.Journal* (a collection of poems gathered from the newsgroup rec.arts.poems), *Atmospherics, Body Electric, Cyberkind, Undiscovered Country, CORE, Inter\face, Descriptions of an Imaginary Universe,* and the *Morpo Review* were just some of the ASCII-based electronic journals that featured lively writings without visual or hypertextual qualities.[24] At least three of the electronic journals that had emerged during this period, *EXPERIODDI(CYBER)CIST, Inter\face,* and *Ygdrasil,* were produced in print and online, which is a sensible approach when works allow for offline presentation.[25] The contents of many of these publications, which may have originally circulated by email, were archived on Usenet and became accessible via the "etext" archive at Michigan and other indexes (using Gopher or FTP protocols); some are still available online more than a decade

later. The Internet enabled very small, "micropress," publications that often featured works emanating from a centralized location to become available to a global audience as a result of its contents' availability on the network. Aesthetically speaking, the visual elements of the publication were sacrificed (a cover image, occasional graphical symbols on pages), in exchange for a significant increase in readership. *Taproot,* a crucial poetry networking publication based in Cleveland edited by Luigi Bob Drake, also published in dual formats (i.e., email and in a printed version that featured additional contents, such as articles and graphics) and was archived in various locations. Hundreds of reviews of poetry chapbooks and magazines (including electronic works) appeared in each issue; the use of electronic distribution enabled the publication to reach a greater number of readers, thereby increasing its influence. *Taproot,* compiling thoughtful consideration of countless publications, represents a venerable effort to heighten the visibility of contemporary poetry; it became required reading for online and offline practitioners of the form.

In an article titled "Writing for the New Millennium: The Birth of Electronic Literature" in the November/December 1995 edition of *Poets & Writers Magazine,* digital poet and critic Robert Kendall discusses various hypertext works—primarily in fiction but also his own poems—and introduces various resources, including an index titled "Where to Find Literature on Disk." Kendall's article mentions a few productions of digital poetry (or, more precisely, poetry digitized) that I have not addressed. Kendall introduces instructional programs with which readers interact to construct sonnets and sestinas (e.g., *Poetry Star,* Chatfield Software 1991; and Judith Kerman's *Colloquy: The Interactive Poem Authoring System,* respectively), CD-ROM collections of traditional work (e.g., Chadwyck-Healey's collection of the complete works of 1,350 British poets, Columbia University Press's *Columbia Granger's World of Poetry*), CD-ROM literary journals (*Hiram Poetry Review, Blam!*), and diskette collections (e.g., from Floppyback Publishing International and Spectrum Press). In 1995 these were among the latest offline developments in the form, all of which have been in development in varying degrees, as demonstrated in works discussed previously.

Kendall's article focused on interactive works but did not report on anything happening on the Internet because as late as December 1995 very little hypertextual, interactive poetry was happening online, a fact that would be far from true just a year later, with the sudden rise of the WWW. Yet as we

see above, in addition to making an impact on the composition of digital poetry as described in previous chapters, computers and digital media contribute greatly to the circulation of poems via the Internet. Poetry has always been present—both in the mainstream and subcultures—in the United States—but now it has a higher profile as a result of the tool and performance of the network.

Works Created and/or Presented in Physical Space

A couple of notable projects were also designed to eschew the terminal as a means of presentation. Artworks such as Jeffrey Shaw's participatory construct *Legible City* (1988–90) are especially pertinent to this discussion. Shaw constructed a computer-video-graphic installation in which the viewer rides a stationary bicycle (with moving pedals and handlebars) through the architecture of a city. An essay by Shaw in Kristine Stiles's and Peter Selz's *Theories and Documents of Contemporary Art* describes this work as being "constituted by solid three dimensional letters that form words and sentences along the sides of streets" (487). Sections of two cities, New York and Amsterdam, were plotted out, and texts were devised to fill the coordinates.[26] More than two decades later attributes similar to those found in *Legible City* are still being explored, as in Charles Baldwin's "New Word Order" (discussed in chapter 5), in which the viewer proceeds through the text of a poem by navigating a three-dimensional gaming interface. Yet in the protean period of the form, only a few works ventured to transform the act of reading into a physical experience. Such applications of digital technology may be seen as frivolous by some, but they unquestionably forecast virtual techniques later explored on the screen by Györi, Vallias, Doctorovich, and others.

The first and perhaps only concerted locally based digital writing collaboration projects that I am aware of in the pre-WWW era is the AWOPBOP Group, organized by Don Byrd at the University at Albany in 1991. A group of poets (and prose writers) met in a computer lab where the computers were interconnected through a local network. Using a software program called Daedalus, individuals could cocompose a single text in real time, with or without viewing what had been previously written. The hypertext *Monique*—which appeared on *The Little Magazine* CD-ROM and has also been transformed to HTML—originated as a piece of collaborative fiction, which the group divided and reformulated with hotlinks (link-node), al-

lowing the viewer variable readings of the text. Both iterations of the work are devoid of sonic, visual, or kinetic elements. *Monique* is but one example of an extraordinary quantity of documents created by the group during three years of activity, which was extended for another year by a smaller group that cocomposed improvisational writings and audio texts and developed multimedia performances under the title Purkinge.[27] Texts by both the AWOPBOP and Purkinge groups were collectively edited and were published in several journals in various media formats. Such work is related to, and was anticipated by, the collaborative *cadavre exquis* (exquisite corpse) writings practiced by André Breton, the cut-up prose works of Burroughs and Gysin, jazz improvisers, and others who practiced spontaneous artworks that absorbed exterior influences and information.

Audio Poems

As I noted previously, a few kinetic and hypermedia works by various authors included sound, but sonic elements had not been emphasized. During the 1980s, however, several digital technologies and techniques evolved that had poetic significance. Digital sampling (the process of cutting and processing segments of recordings), the CD, Musical Instrument Design Interface (MIDI), Digital Audio Tape, and Minidisc formats and tools were all available by 1990, though because of their cost they were for the most part only available to artists with corporate support. Many artists had already documented and produced audio works or anthologies using analog equipment and magnetic recording tape (or video), some achieving multivocal sonic output qualities that would later be automated in digitally processed works. Kostelanetz, in "Text-Sound Art: A Survey" (the introduction to *Text-Sound Texts*), identifies 1955 as the historical moment at which a verbal artist, "now equipped with sound-tuning equipment, could change the volume and texture of his microphone-assisted voice; he could eliminate his high frequencies or his lows, or accentuate them as well as adding reverberation. . . . The language artist could add present sound to past sound ('overdub'), thereby making a duet, if not a chorus, of himself. He could mix sounds, vary the speed of the tape, or change the pitch of his voice" (19). The characteristics of sound processing outlined here closely correspond to the ways poets began to implement aural elements into digital poetry.

Experimental sound poets such as Henri Chopin and Charles Amirkhanian began to explore the use of digital devices during the 1980s, and, as pre-

viously mentioned, Xexoxial Endarchy produced hypermedia works (*Zaum Gadget,* 1986; *Noise House,* 1992) that emphasize processed sounds; mIEKAL aND produced a very sophisticated graphical and audio poem package, *Babbally: The Destruction of Mindfuck Diplomacy* (ed. Luigi Bob Drake), with Burning Press in the 1990s that featured radical digital sampling and looping effects. Meanwhile, poets like Edward Sanders, Jacques Donguy, John Giorno (whose 1969–70 "Dial-a-Poem" project had made seven hundred poems by fifty-five poets available by telephone, and whose label Giorno Poetry Systems produced several experimental spoken word albums in the 1970s and 1980s), Kostelanetz, and others experimented with analog devices (tape or electronics) and/or digital tools that created the effects of vocal delay and other processes to loop, cut and paste, or reverberate, their voices. Digital samplers, which could be used to record and recombine sounds (some of which could send signals out in a MIDI-standard, thus uniting voice/sound and computer program), were widely available by the mid-1980s, as was audio software for Macintosh computers that did much the same. In the early 1990s many poets and performers used digital sound tools to perform and produce multitrack recordings, including Jackson Mac Low and Anne Tardos, John M. Bennett (a.k.a. Ficus Strangulensis, who with his imprint, Luna Bisonte Productions, produced multiple cassettes such as 1993's *Coruscation Drain*), Elisabeth Belile (*Your Only Other Option Is Surgery* [New Alliance Records]), Bob Holman, Tory Miller, genre-bending sound artists like Pamela Z, and others.[28] Quite a few audio publications were issued, ranging from commercial recordings such as Allen Ginsberg's *The Lion for Real* (recorded in a state-of-the-art analog multitrack studio with sophisticated musical accompaniment, then mastered digitally) to the many DYI-style cassettes issued by Jake Berry's Experimental Audio Directions and by other groups. For the most part cassettes were the popular medium of distribution, but beginning in the early 1990s, CDs such as *We Magazine Issue 14* (1991) appeared, and other spoken-word artists and publishers had begun to produce CDs. For a selective index of resources for poetry available in audio formats during this period I refer readers to the "Audio Resources" section of Charles Bernstein's anthology *Close Listening: Poetry and the Performed Word,* compiled by Kenneth Sherwood in 1997. Although incomplete with regard to subcultural/underground projects, it lists many excellent recorded anthologies, sources for recordings, and library archives of audio collections.

Aesthetically speaking, the relationship and similarity of sonic effect be-

tween the experimental digital audio poets and their analog predecessors cannot be overstated. Much of what could be accomplished previously (audio compilations, sound effects, chance juxtaposition, fragmentation, and looped arbitrary sequencing) was now facilitated with the computer. For example, audio works such as the 1970s electroacoustic sound poems of Amirkhanian (e.g., "SNIRO") were originally produced in a studio with reel-to-reel tapes, spliced and processed in a range of ways.[29] These works might now be easily mistaken for a computer composition made with a digital sampler and software. By the 1990s Amirkhanian was using digital tools to compose and perform his works (via Synclavier digital synthesizer) because of their advanced capabilities in fusing sound and lyrics. The tape loops, tape delay, and rhythmic multitrack layering of word and soundscapes he had been able to achieve previously on tape are now subject to digital modulation. Artists such as William S. Burroughs and Brion Gysin developed cut-up techniques, splicing audiotape to achieve random, unpredictable effects. The technological developments were more commonly useful for the material production and circulation value; aesthetic leaps by previous artists had already proven sound poets could accomplish tasks or acoustic processes facilitated by computers. On the other hand, some poets—even some of the most experimental poets—polemically opposed the use of electronics and other amplified technology. For instance, in the essay "Voice in Extremis," published in the anthology *Close Listening,* Steve McCaffery reports that the Canadian sound poetry movement had at the time enacted a "wholesale rejection of technological enhancement and manipulation of the voice" in what he describes as "paleotechnic" performances (168). This group, McCaffery writes in "Discussion . . . Genesis . . . Continuity: Some Reflections on the Current Work of the Four Horsemen," "felt that there is a significant difference between human energy per se and extended human energy through electronic processing" (280). At the conclusion of this piece McCaffery acknowledges that there is "Audiopoetry: the poetry of technologically treated voice," but he associates it with "graphicism" of the "scripted sign" and the "actual activity of writing"; he explains that the intention of the Four Horsemen was to "transcend writing" (280).

Speech recognition software was another relevant audio capacity that emerged in the 1970s. The technology enabled vocal response from, or interaction with, the computer—as early as 1975 a vocal input recognition system (which could only recognize thirty-two words) had been developed. At the very least a supplement to the graphical interface, the poten-

tial of this type of device is largely unexplored.[30] I have yet to encounter a digital poem in which interactivity is engaged by the viewer's spoken voice. The most basic form of audio is the playback of recorded information or the digital jukebox model (which would become enormously popular with the advent of mp3 technology and file sharing via the WWW). Interactive texts that include sound, however—either as vocal narration or aural annotation—have been produced, as detailed in the previous two chapters. Digital audio technology was used to document or present recorded works and incorporate them with images and other contextual materials on CD-ROM.

On the Internet early audio resources included the previously mentioned *UbuWeb* (founded in 1996) and *LINEbreak* (see <http://epc.buffalo.edu/linebreak/>), a series of broadcasts produced by Martin Spinelli, with host Charles Bernstein, who from 1995 to 1997 conducted twenty-three readings by (and discussions with) experimental poets (like Mac Low, McCaffery, Lyn Hejinian, and Hannah Weiner). *LINEbreak* was archived on the Internet and was circulated via cassette; it was one of the first radio programs to be distributed via the Public Radio satellite system, through which it found its primary distribution. A combination of factors, however, combined with the lack of availability of PC software in these years made the Internet audio-prohibitive (thus Spinelli's need to produce cassettes); only a few technologically inclined poets, such as Sherwood and Glazier, had posted sound files on the Internet by 1995. For several years an Internet user could post, access, or mail sound files across the network but could not hear sound as he or she read a text because of a lack of bandwidth (typically via a modem/telephone line), as was the condition of Glazier's "5 Pieces for Sound File." Of course, this is no longer the case, as viewers without solid multimedia equipment and reliable Internet connections are able to make real-time connections.

Once the WWW emerged, real-time sound and multimedia pieces began to appear. Among the first works I encountered was *VOCABULARY,* a Shockwave audio poem by Christine Baczewska, in which the viewer controls sung phrases by moving the mouse over the phrases of a visual poem.[31] The audio text happens as various parts of the screen are interactively engaged by the viewer. Other early WWW manifestations of audible works included Ian Campbell's "Glimpses of an Afternoon," a kinetic collage with high-quality graphics and a persistent streaming soundtrack (which is unalterable); in another work, "Make Way for Jiggy," by Dan Brodnitz, the

viewer selects a sound file, and a reading begins, a tale with multiple paths. Links in this piece connect to other sound files.[32] Jim Andrews has many interesting sound pieces on his Vispo WWW site, including his sound poems from the late 1980s and the later interactive audio poem "Nio" (<http://www.vispo.com/nio/index.htm>). The relation of poetry to digital sound is particularly significant at this time and will further prosper as the wide-scale digitalization of audio poetry opens such material to manipulation, collage, and mixing that is presently being engineered by multimedia artists around the globe. Ongoing technological developments in the audio realm will likely establish sound-based works as a central force in the practice of digital poets.

Observations

In spite of the somewhat primitive conditions for audio-based digital poetry in the prehistoric era, a number of artists determined to create audio works, many of which stem from the sonorous tenets previously established by sound poets who relied on their own voices and bodies to produce and distort sound and language without relying on technological apparatus. The implementation of processed sounds in works of digital poetry progressed alongside technological conditions. Ultimately, it is evident that computers are capable of storing and processing sound and can be used effectively as distribution mechanisms. Digital technology can preserve the voice, alone or with fanciful effects and accompaniment. As Jennifer Ley writes in the introduction to the "Sound/Text Hypertext Text/Text" edition of the WWW publication *Riding the Meridian* (1.2 [Nov. 1999]), "new software like RealAudio has put the means of making and distributing aural poetic components in the hands of anyone who owns a home computer and a microphone."

My exploration here has briefly outlined the progression of some of the fringe aspects of the lineage of digital poetry so as to illuminate the aesthetic circumstances for the gamut of early computer compositions. In these manifestations of digital poetry the expressive issues do not consider whether the computer can write poetry, or graphically enhance it, but how various types of machinery have been used to accentuate and modify poetic process and range. The collaborative composition of online texts, as practiced by groups, in MOOs and elsewhere, extend previous forms of written collaboration into a virtual environment. Atypical modes of design and de-

livery are characteristic of quickly and widely delivered publications. In the network era computers are no less a creative tool and are now being used as a mechanism to circulate contemporary and historical productions. Digital sound tools and processes alter the way voices are constructed, heard, and combined. In so many ways computer technology has been used in conjunction with poetry, as writers invent new practices and reinvent old ones with digital media.

5
Techniques Enabled

(Pro)Fusions after Poetry Computerized

> The past must be invented. The future must be revised.
> Doing both makes what the present is. Discovery never stops
>
> —John Cage, *I–VI*

Over the past several decades poets have invented numerous ways to produce works using computer technology. Sometimes devised as simulations of old forms and models, many digital poems can be considered "new" by virtue of their presentation. The genre's development parallels the rise of new technological apparatuses—as computing has become more centrally integrated with culture, more people have become involved with using computers for creative endeavors. Digital poetry may not have developed to the point where "people will stand in front of it and insert money, dimes or quarters, / depending upon the poem's locus," as Lionel Kearns imagined in his 1968 "Kinetic Poem," but in some regards the genre has reached a state in which "'one perception must immediately and directly lead to a further perception,' / And therefore the audience will be compelled to feed in coin after coin" (*By the Light of the Silvery McLune* 60). Although I do not wish to suggest that digital poems are absolutely indicative of what Olson meant in "Projective Verse," growth within various forms and the aesthetics suggested by Kearns are represented in many texts reviewed in this volume. It is likely that the genre would have stopped dead in its tracks had its experiments failed to produce compelling results. Instead, the growing numbers of digital poets—and poetry readers—reflects a burgeoning interest in the expressive capabilities of computers.

"The impact of electronic technology on our lives is now the object of intense study," writes Marjorie Perloff in the opening chapter of her 1991 study *Radical Artifice,* "but what remains obscure is the role, if any, this technology has in shaping the ostensibly private language of poetry" (3). The contents of these chapters seek to divulge the role that digital technology

has begun to play in the composition of poetry. In Perloff's view, "the most common response to what has been called the digital revolution has been simple rejection" (3); she explains that the consensus among most poets was that "technology . . . remains, quite simply, the enemy, the locus of commodification and reification against which a 'genuine' poetic discourse must react" (19).[1] We now know that this is not at all true, and many poets are working with digital forms—this study does not merely reflect my own creative interests but the interests of my surrounding culture. The initial, conservative response acknowledged (though not promoted) by Perloff is now a dated fallacy. Digital poems are visually shaped and animated by software and programmed into lyrical forms of all sorts through computer coding; their hypertextually integrated fragments are initially arranged by the author and then reordered by the viewer. Poetic language plays various "roles." It animates language and dynamically infuses the computer screen with atypical elements. For instance, even though animations now play a primary role in advertising on the WWW, few businesses are plotting their Flash movies in a mode comparable to Stefans's *the dreamlife of letters* or presenting anything akin to the kinetic, aleatory material found in Cayley's refined works.

In contrast to those who use technology to market and sell products, digital poetry subsumes old forms, and invents new ones, and more intensively explores the possibilities for alternative forms of communication. Without the expectation or pressure to turn a profit, poets have had the liberty to consider and employ unconventional material aspects. As Eric Vos writes in "New Media Poetry—Theory and Strategies," his consideration of approaches to new media literature, "The innovative force of new media poetry lies not in the communicative channels used (e.g., computers, video, holography) *per se,* but in the exploration of their ramifications for syntactic, semantic and pragmatic aspects of verbal/poetic communication in general" (215). Vos observes that the first poetry on the Internet aspired to the basic conditions of print poetry, and he suggests that this is not the standard that digital poetry should set for itself. Fostering new types of poetic communication, Vos asserts, "is the focal point of both the new media and the new poetry that make up new media poetry" (218). In the foregoing reviews I have described the numerous ways poets have ventured to pursue such objectives.

Digital poets working today, as always, may have any number of background experiences; one can be trained as a poet who applies literary skills

to technology, a programmer who pursues unconventional means of creative expression, or something else—like an artist who has opted to include elegant verbal elements in her or his electronic work or simply someone who knows how to use a computer and has an idea. Despite the demographic expansion of digital poets and poetry readers that has occurred on a global level since the WWW emerged in the mid-1990s, the genre still comprises works that share commonalities and aesthetic traits with historical productions introduced in the preceding chapters. Digital poetry is a by-product of multiple expressive forms that came before. Perhaps unintentionally, today's productions, while more aesthetically polished, hold many similarities—beyond their technological association—with work produced in the years before the global network was founded. The rise of the WWW has not created a break between the past and present but rather represents another stage of technological advancement for the culture at large and a moment of stabilization for digital poetry. Diffuse and hybrid forms have been drawn together as a continuum in their copresentation on the network and in works that were developed offline.

As writing mixes with digital media, computer-based compositions have been conceived using a variety of methods; words are configured into texts that are surprisingly expressive, assembled by devices built for calculation and used mainly as mechanisms for the exchange of capital and information (though increasingly for the transmission of entertainment and communication). Poets and programmers working with hardware and software continue a tradition of writing that merges poetry with image, programmed language, cultural observation, and expressive symbols; many of the artworks introduced in previous chapters are clearly related to challenging verbal-visual techniques of the past, even if they endeavor to find unique, contemporary ways to process and refine language. From a consideration of the past emerges a mechanical display of the postmodern present, as artists strive and successfully cultivate language in what would have been, fifty years ago, futuristic communicative styles.

Digital poetry in all forms reflects and exploits the highly processed, mechanical aspects of the cultural moment we now live in, and computer programming and software change the ways in which text(s) can be manipulated. Writers open to working in visual and hypertext forms can take advantage of aesthetic fusions, layering dimensions that are difficult if not impossible to enact on a printed page because they are kinetic and/or cyclical, disconnecting from one another by design. Text-generators and other

language-processing programs have helped poets to both reinscribe and wildly distort conventional forms of writing. As in earlier poetry, a type of translation of (or from) the world occurs in digital poetry. Creating poems presented by or for computers, however, requires other processes than writing words down—the verbal climate of the digital poem depends on the successful implementation of many procedures, both technical and artistic.

Literary art in digital form takes on many different appearances and its textual dynamics are not uniform. Authorship engages with technology; writing mixes with other elements empowered by digital media. Despite the challenges of evolving software, computer platforms that become obsolete, and other fragilities, digital machinery is increasingly used as a staging area for poetry. Computer coding allows authors to synthesize multiple layers of text for the viewer/reader; hardware and software amplify and generate writing, presenting visual, oral, and/or alphabetic dimensions of text. Digital technology is now part of a compounded form of writing, whether in the form of word processing, desktop publishing, or in the movement of work created beyond the "permanence" of the page. Writers who use digital media combine their vision and linguistic skill with visual and auditory communication and are creating a genre of new forms within the multitudinous realm of poetry. In its transformation from code to computer, digital writing and presentation use the alphabet and other symbols/images in electronic space, creating a tactile sense of language and expression that effusively pours out of computer screens. Language—poetry's principal vehicle—is no longer lodged on a fixed, silent page, as it is in print (even if readers "sound" poems as they read). Words from one language enter a dynamic and transmittable circuitry through another—computerized—language that establishes built-in links, intricate graphical components, soundtracks, and other capabilities. Vivid poetry is now charged with additional dimensions, and poets continue to cultivate a complex relationship with language in a society of linguistically simplified popular media.

We are left to question whether the prosody of digital poetry—what the work actually consists of and how it is presented—will vary as technology evolves or whether the basic dynamics have already been established in the examples of early works. Computers and interfaces merely a decade hence may not resemble today's machines, but the literary content may not vary from the formal foundations delineated herein. Currently developing hardware like vocal-response and iris-tracking mechanisms—where a viewer's voice and eye movement activate paths and dimensions to the text—will

eventually alter the ways in which texts are produced and absorbed. Yet digital poetry's general textual parameters seem well established, at least until some sort of new technological plateau is reached. While precomputer literature evolved radically within individual modes of literary production (oral, written, printed, etc.) without requiring technological advancement, it may be that digital poetry, closely tied to technology, will require both technological and imaginative evolution in order for significant growth to be attained. Explorations into digital poetry will continue as long as computer usage remains widespread; but how could productions of digital poetry grow—and into what?

WWW Works

Comparatively speaking, the small body of digital work predating the WWW represents only a tiny fraction of the genre. The versatile, massive, global network unquestionably ignited a proliferation of digital poetry, boosting the confidence of artists who had previously been wary of the instability of technologically based writing. Yet despite the transitory, ever-evolving technologies and elements, the principles and features of digital poetry—text generation, flexible and collaborative language, use of sonic and visual attributes, interactivity and intertextual linking—have been altered only slightly if at all, as I will consider below, using a selection of texts that have been produced on the WWW. Including this context also enables me to assert that the genre, despite its clear development in the prehistoric era, is far from being fully realized. The coming years will indicate whether a more televisual poetry, such as we begin to see in the highly animated, visceral Shockwave or Flash poems and WWW works in general will dominate artistic literacy or the culture at large. Digital poetry is still forming and gradually progressing, though it continues largely to embrace the characteristics, and sometimes the limitations, of its predecessors.

Digital poetry on the World Wide Web is brought together in HTML (hypertext markup language), a comparatively uncomplicated process of coding that allows a synthesis of graphical elements (in color), animation, sound elements, and other coded features, with any "written" text. Hypertext markup language had a small impact on the development of digital poetry. Increased access to computer technology has made for a bigger readership—unfortunately, incompatible operating systems (e.g., Windows and Macintosh), browser differences (e.g., Netscape and Explorer), and the

need for specialized software extensions (e.g., "plug-in" devices) sometimes give the impression that digital poems lack fluidity, even though bandwidth transmission has widened.[2] Interference from the interface can still prevent or impede presentations, though it is also clear that the medium is capable of infusing the form with sophisticated content. Aesthetically, the predominant condition of formal linearity in WWW digital poetry presentations can seem contradictory; even digital poems that use "random," "animation," and "looping" procedures are usually self-confined, mainly linear segments that appear as individual works of art. Though they theoretically exist within a much larger domain of potential images, the teleologies and terminal points at which a reader may go no farther are numerous; these digital poems can theoretically branch in infinite directions, but they engineer themselves into a corner, forcing readers to begin again. The technology is not being used any more profoundly than a footnote in a book, although the work is often graphically driven.

Digital poems began to appear on the WWW as soon as it emerged, and by the mid-1990s each of the forms that constitute the genre could be found there.[3] Using hypertext and hypermedia, Christy Sheffield Sanford and Diana Slattery prepared some of the first works of digital poetry on the WWW in late 1995 and early 1996. Slattery's *Alphaweb* and Sanford's work were remarkable for their stylish appearance and methods of connecting disparate forms of text by using graphical communication. *Alphaweb,* by design, combines the use of vibrantly visual and alphabetic cues to guide the reader through the text. Slattery uses twenty-six graphical and alphabetic links to interconnect arrangements of verse. At the end of each passage the viewer has the option to navigate texts subjectively through given images or an alphabetic table. This application of hypertext, using a graphical table, recalls Rob Swigart's appropriation of the periodic table in "Directions" and the style of graphical navigation used in works by Jean-Marie Dutey (e.g., "Les mots et les images," "Les trois petits cochons"), though the quality of Slattery's imagery, prepared using common graphical tools, is more vivid. Sanford's work is exciting because of its high-quality imagery, inventive technical application, and breadth of subject matter. Two early pieces, "Boucher en vogue" (1996) and "Spring" (1996) use the WWW's capabilities to great effect by linking to external sites located elsewhere on the network. She fortifies and expands her poetry with radiant imagery and links to guide the viewer from one section of text to another. Sanford's visual imagery is dynamic: images do not merely decorate the narrative

but layer meaning and act as navigational levers. Although Sanford's poems were initially static, they gradually became driven by moving imagery related to the theme of the poem. *Safara in the Beginning (With Bible Verses, Motion Pictures and Field Guides)* is particularly notable, using animated images (such as insects), virtual collages, and texts to inscribe an antioppression theme. This work presents a parallel story employing biblical passages along with her poetry. As seen previously in Jean-Pierre Balpe's "Autobiographie," Sanford makes use of mapped images (i.e., pictures that contain links) and displays multiple associated texts simultaneously. At the outset of the WWW, digital poets, even if they were unaware of their predecessors, were actively refining techniques that had been rudimentarily proposed in previous titles.

At this time many other works sprang up on the WWW. Poets such as Glazier, Andrew Stone, and Alexis Kirke produced early works. Glazier quickly moved from creating typographical and sound experiments to making use of image collage, hypertext (involving both images and associated files), animation, Java, and other procedural methods.[4] Andrew Stone created a simple but illustrative hypertext poem, "The IndraNet" (a thematic model also used by Cayley), to illustrate his view of "the entire web as one gigantic interwoven organism" onto which "HyperPoetry" could be an "active lens." Initially, each of the poem's ten lines had links to a range of WWW sites, including the Central Intelligence Agency, *HotWired,* sites for job and volunteer opportunities, French culture, and a space telescope science institute. This small experiment proves Heim's point (chapter 3) that many disparate motifs can exist within the same textual or media-based structure. Unsurprisingly, nearly ten years later more than half of the links are broken (an unfortunate problem overshadowing some WWW works). Kirke's "Medical Notes of an Illegal Doctor" is a "hyperpoem" that "can be mutated by the reader," who can submit text that will be added to the poem.[5] The poem itself is set up in one large file; the author embeds a series of "anchors" that allow a nonlinear reading of the text. This type of movement from stanza to stanza recalls techniques used in pre-WWW hypertexts covered earlier.

Discussing some of these works in a *Talisman* article—which became the basis for the online "Proto-Anthology of Hypermedia Poetry" I created in 1996—I remarked that these works were impressive for their graphical qualities and in some instances for employing hypermedia to great effect by linking to external sites. At the outset of the WWW there seemed to be

more inclination to connect digital poems with exterior materials, but as the WWW became a more popular vehicle for practitioners to share their poems in a noncommercial setting, works became more aesthetically sophisticated but less adventurous. More emphasis was placed on an individual's ability to organize her or his own materials and vision than on positing a text within a larger body of interconnected documents (which was Nelson's original concept of hypertext).

For example, in several works created in 1996 and 1997 Laura Jordan (programmer) and Yolanda Astuy (writer) collaborated to present poetry combining sound and animation using Shockwave and Java. "Haiku" unfolds as the viewer clicks on the word *haiku*—thunder sounds and a poem is read in Spanish over the stormy background soundtrack. In "Eating Apples" words of a poem about anorexia slowly fade onto and off the screen. The soundtrack of the poem is spoken in Spanish, accompanied by a sample of someone loudly eating an apple while the words pulsate across a shimmering background. These examples utilize a greater amount of multimedia processing; sound effectively extends the language's effect and message, and the animations are fluid and realistic in their three-dimensionality. Although reminiscent of works found in *Alire,* these poems move a step beyond previous experiments as they inscribe high-resolution graphics and audio components.

Many animated and video poems have been developed in the WWW era to enliven language using various compositional techniques. Some feature footage shot with a video camera, but more often they use a cameraless (borrowing a phrase used by Kostelanetz) approach to presenting the poem-as-movie. Initially, such works were presented as miniaturized animations, as seen on Komninos Zervos's "Cyberpoetry" site (circa 1996) and on the *Interpoesia* CD-ROM (Wilton Azevedo/Philadelpho Menezes, 1997–98). One especially refined visual and kinetic work, produced using Macromedia Flash and presented on the WWW, is Brian Kim Stefans's *the dreamlife of letters.* Stefans, employing the alphabetized words of a text by Rachel Blau DuPlessis, made a series of short static " 'concrete' poems based on the chance meeting of words (with prologue)." Then, using smooth, grayscale letters on an orange backdrop, Stefans renders a short film of the ordered letters, enlivening the already fragmented words of DuPlessis's "very texturally detailed, nearly opaque" piece. In Stefans's version words twist upward in spirals, spin like a propeller, stack into grids and rows, bounce, flow in vertical columns, and blend into one another. As Strehovec observes in

"Text as Loop," the "meaning" of the poem is created by the "quick transitions to anti-words, derivative words, and even non-words." These words become something else when put into motion and certainly differ from what they are on the page. When the word *Cixous* bounces, it gives the viewer something more to consider with regard to the relationship between sign and signified. The quick and rapid presentation of asyntactic fragments is visually interesting and keeps the reader attentive to see how (or if) they connect with one another. The versatility of animation, and the author's control of it, are especially astonishing. The animated materiality of language, as it has been in previous forms (Nichol, Layzer, Kostelanetz, Melo e Castro) is also outstanding in the latest videopoetic versions. Letters are totally broken down, reshaped, and reassembled. Pieces of letters are used to build other letters in multiple dimensions, and the language appears to interact within itself.

In his award-winning "text movie" *windsound* (2001), John Cayley cinematographically advances his HyperCard works of the 1990s (a process that began with his 1996 poem *Oisleánd*).[6] In *windsound,* which only runs on Macintosh systems, Cayley removes the viewer's control of the output on the screen (though in later pieces, as described below, he also develops navigable movies that include "transitional phases which are generated 'on the fly' "). Visual and poetic values transpire on the screen during the "transliteral morphs (textual morphing based on letter replacements)" that are illuminated in a sequence of alphabetic shifts that occur between nodal texts while the program is running.[7] As in his later work "Overboard," which is "installed as a dynamic linguistic 'wall-hanging,' an ever-moving 'language painting,'" Cayley presents *windsound* as screens of text that algorithmically unfurl into one another over the course of twenty minutes. These works are to be observed, not interfered with. When any of the nodal texts begin to reach lucidity, the possibility of clear communication immediately begins to devolve. The viewer sees animated text, hears a continuous low-level audio track, and, at various times, hears synthesized speech from one of three voices. As explained in his essay "Literal Art" and elsewhere, Cayley has made himself known for addressing linguistic structures at a granular or atomic level to create (or re-create) literary expression. In her comments on the piece Heather McHugh writes that *windsound* "reveals the power of letters, even as it plays with the limits of literal intelligibility. It explores the power of sequences, even as it plays with non-sequitur" and "bespeaks significant emotion" in its manipulation and presentation of language.

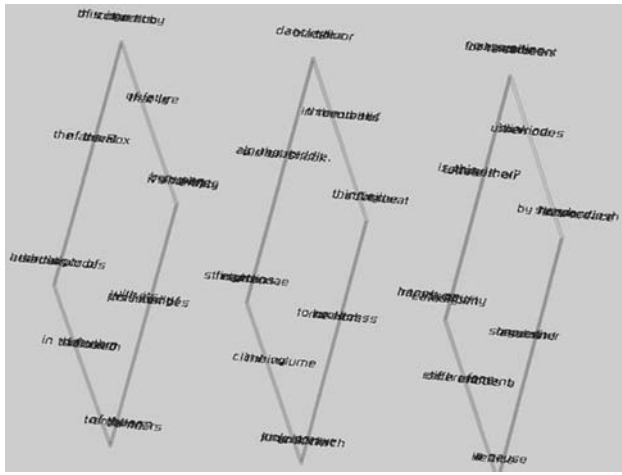

Fig. 5.1. Aya Karpinska. Screenshot (March 9, 2005) from *the arrival of the beeBox* <http://www.technekai.com/box/beeBox.html>.

Another graphically spectacular piece, Aya Karpinska's *the arrival of beeBox,* is interactive rather than videographic. Karpinska uses 3-D modeling software (3D Studio Max) to render three separate planes of language, each containing seven clusters of layered words. The poem pivots on a wheel and emerges while being navigated by the reader, who has downloaded the piece and acquired the necessary plug-in device. These constellations of language are at first indecipherable (fig. 5.1); the viewer must discern how to negotiate, plot a course, and read through the multiple dimensions of words.

By manipulating the computer mouse, the viewer can magnify the text(s) and bring any area of the document to the foreground (e.g., "dancing on a / black tile floor," fig. 5.2). This particular interaction with the text recalls Rosenberg's *Intergrams,* though it imposes a different sort of visual, nonlinear syntax. Viewers may neither add nor delete content from Karpinska's gamelike poem, but they can manipulate and arrange selected sections, which operate as a row of Ferris wheels comprising words stacked on top of each other in space. Unlike Stefans's piece, which objectively appears the same to every viewer, *the arrival of the beeBox* is interactive and less temporally based; the viewer is both coconstructor and consumer.

Naturally, graphical and hypertextual poems are abundant on the WWW. Even text generators, the earliest form of digital poetry, have been available for download on the WWW since the 1990s through resources such

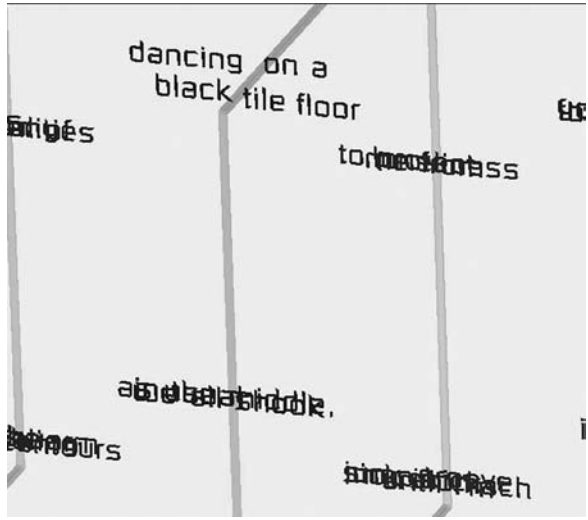

Fig. 5.2. Aya Karpinska. Detail of screenshot (March 9, 2005) from *the arrival of the beeBox* <http://www.technekai.com/box/beeBox.html>.

as Marius Watz's computer-generated-writing site and Luigi Bob Drake's *Textworx Toolshed*.[8] Many of today's generators, however, are presented in new ways. For example, Glazier's *IO Sono at Swoons* (2002) is not a program that users download and play on their PCs, as were the programs Watz gathered. Glazier's work, authored with Java, plays "live," molting in vibrant colors on the WWW, continuously renewing itself on the screen in real time. The dynamics of the work are neither linear nor complete; the language presented is a disorganized mishmash of languages (including interruptive diacritical marks), with references to Tibet and the names of other digital poets. Glazier is not attempting to present individual poems, as have most programs in the past. There is no convenient way to reproduce the poetry; the only ways to document the program are by video or by screen capture. Other advanced examples of automatically generated digital poems can be found on *Permutations,* where several "server-side computer programs written in the Perl programming language" emulate a range of historically conceived combinatory poems (such as anagrams, proteus poems, and cut-ups); the site also includes less-traditional-oriented initiatives, including "Autopoietic Real Time Music and Text Systems" (Karlheinz Essl) and a "Neoism Machine" (Monty Cantsin).[9] *Permutations* is a useful, interactive,

and informative site, wisely designed to work in all browsers without requiring downloads or plug-ins. In many works viewers can identify any WWW site (by entering a URL), or insert their own documents, as the source text to make a poem. Users can set further parameters in some programs via menus containing processing options (e.g., size of alphabet or type of numerical conversion in Cramer's "Gematria/Anagrams") or—as in this site's version of Queneau's *Cent mille milliards de poèmes*—by selecting the source text to output from a range of choices on pull-down menus. In addition to inviting the input of text or URL, the program that demonstrates Tzara's cut-up method uses a pull-down menu to give the viewer a choice of twenty online newspapers to cut up. Texts are generated quickly, and the viewer can watch how each poem functions.

Many of the pioneers of digital poetry whose works are discussed in previous chapters continue to explore the media's abilities to advance expression, communication, and literary culture. In France Jean-Pierre Balpe continues to program text generators of various sorts and is director of the Department of Hypermedia at the University of Paris VIII; he has expanded the scope of his work to include interactive multimedia museum installations (see below). In 2003 Philippe Bootz cofounded yet another group, Transitoire Observable (of which Balpe is a member), which focuses on "numerical" art and, as their WWW site reports, "the globality of systems which are using computers and not only on the forms of surface which can be observed on-screen." This organization, consisting of members from several continents, circulates media-based poetry via a WWW site and organizes events to discuss and display research and craft. Pedro Barbosa, while maintaining an interest in algorithmic writing (i.e., programming text generators), has begun to incorporate generated text in an interactive 3-D hypermedia environment. Barbosa refers to his most recent work, *Alletsator,* as "opera" or "cyberdramaturgy" that is sequenced by the viewer, guided by an onscreen robot (or, in computer gaming lingo, "avatar") named "Anaximandro Macromedia," through a rich graphical environment while Barbosa's generated poems are recited (email 2005). Alan Sondheim's perpetually developing work—both on the WWW, CD-ROM, and in performance—integrates kinetic elements, language, audio, and images. He has also created work in immersive environments (e.g., "World Premier: The Phenomenology of the Virtual"; see <http://www.as.wvu.edu/clcold/sondheim/>) and stimulates philosophical and theoretical discourse by moderating the listservs *Cybermind, Cyberculture,* and (with Sandy Bald-

win and Nick Hale) *Wryting,* a publication addressing "net criticism, collaborative text filtering and cultural politics of the nets." A prolific writer, Sondheim manages a hypertextual archive of his compositions (sometimes presented in video or image formats) titled "Internet Text," which he describes as "a continuous meditation on cyberspace, emphasizing issues of interiority, subjectivity, body, and language." In this repository of texts Sondheim's topics are generally related to "Net applications," in which he often refers to and appropriates the symbols and language that illuminate the "underlying architecture and protocols of telecommunications." In essence, the technological code(s) and terminology used to create or to project media elements also become a part of the verbal text (for more discussion on this trend, which Sondheim has dubbed "Codework," see appendix A).

Obviously, the works described above indicate earnest attempts to employ new media to advance poetry on the WWW.[10] New capabilities, developments, and trends will continue to transform the appearance of texts (at the very least) and may very well contribute to further areas of formal investigation that surmount text generation, graphical representation, and hyperlinking. As the WWW's platform and composition tools have become popular, writers have become more willing to explore writing and design (literally *de:* or *from* the sign) on the WWW, where words become images and can also be voiced. Computers allow a type of expansive communication through electronic networks and connect readers who have become accustomed to a screen rather than a page. The cultivation of such a media-oriented culture in general is underway; the combination of human curiosity and technical capability will determine the advancement of digital literature.

The influence of computer technology and the WWW on the aesthetics and presentation of poetry are also profoundly seen in books such as Stephanie Strickland's 2002 collection *V: WaveSon.nets/Losing L'Una,* in which digital media play a significant role in extending the printed object.[11] Strickland, the author of several fine hypertexts (*True North* [Watertown, MA: Eastgate Systems, 1997]; *The Ballad of Sand and Harry Soot* [N.p.: Word Circuits, 1999]), actively explores the poetic possibilities of combining book and electronic (WWW-based) forms. In *V* readers must consider and establish a relationship between the parts of the book and a WWW site, putting these separate yet interconnected texts into play with one another. Strickland's effort here is a successful, conscious hybridization of form and platform. *Losing L'Una* employs a numbering system to effect a mysterious in-

dication of motion and splitting or separation. Since the poems are in a fixed order, numbers embody a periodical energy. In the poem's electronic format, the viewer confronts an interactive starscape that he or she scans with the mouse to view visual and verbal constellations that link various poems to each other. A new surface—in the form of a single word for each star—also appears. Excerpts from the poems associated with these thematic words unfurl as the viewer scans the points in Strickland's virtual sky. Passages in various fonts and colors collide and morph into other passages, allowing the reader to meaningfully reconsider the contents of the printed text and adding new dimensions to what a writer can do with a book.

These leaders have influenced new generations of digital poetry. The experimental tradition in Brazil has already, for instance, extended from the concretists; the flame of its digital counterpart burns brightly.[12] Of the next generation, André Vallias has continuously authored complex and graphically vibrant poems for CD-ROM and WWW (see *Aleer,* <http://www.refazenda.com/aleer>; and *Erratica,* an ongoing anthology of art he coproduces, at <http://www.erratica.com.br>), while his former teacher Wilton Azevedo, whose digital art first emerged in the late 1990s, has produced sophisticated audio and kinetic poems under the monikers "Interpoesia" and "Loopy Poetry." Lucio Agra uses the common Microsoft program PowerPoint in atypical and inventive ways, making use of everything that the software has to offer, and in 2003 he coproduced a CD-ROM, *Revista Cortex* 1 (with Guiherme Ranoya and Thaigo Rodriguez), that includes participatory, explorative poems by Arnaldo Antunes, Lenora de Barros, Henrique Xavier, Joao Bandeira, Omar Khouri, Ronaldo Azeredo, and others. Many artists are now producing digital poems: a list of contemporary examples of digital poetry in Brazil, France, England, Germany, the United States, and elsewhere could go on and on, and the genre has reached Asia and Africa. The level of activity has increased, expanding the demographics of the genre. Meanwhile, the form's parameters are becoming more refined, and many individual hybrid texts indicate the genre's advancement, although the various components of these amalgamated productions have been practiced for more than a decade.

Each of the forms within digital poetry bears elements of performance and translation. As performances, digital poems are not (yet) dramas with actors on stages but are sometimes interactive, a quality not usually encountered by theater audiences. Digital poetry is a creative, interdisciplinary exhibition or "screening," where language and computers serve as mediators,

as contemporary interpretations of writing. A completely different language, the language of computer "programming," intervenes and recreates sense and vision within the poetry. Code, translated by the machine, is the language that handles writing.

In the introduction to *Poems for the Millennium: The University of California Book of Modern and Postmodern Poetry* (1995), Jerome Rothenberg and Pierre Joris write, "With regard to twentieth century poetry, a new look has been long overdue" (11). I believe that with the rise of the WWW a "new look" arrived on a wider scale, even though it is evident that writers had begun to participate in a self-made tradition of using digital media to combine vision and language many years before. Many works, prepared for the screen instead of the page, exploit the possibilities held by the alphabet and other symbols/images in electronic space. As Darren Wershler-Henry writes in an IRC chat that is included in Stefans's *Fashionable Noise,* "the website is the first truly new mode of poetic composition that's come down the pipe in a long time" (22). Forward-looking artists are cultivating expression through digital technology, offering something quite valuable for writers (and the preservation and promotion of writing) in a genre that combines the essential sense of "the word" with imagery, linking, digital layering, and thought.

The very loose-knit community of prehistoric digital poets was relatively small, and many artists who develop work on the WWW are only minimally, if at all, aware of the works produced by researchers in the previous era. Even as a scholar who has been actively studying digital poetry for more than a decade, I am continuously learning about new experiments that were conducted prior to the WWW. I make this point not to belittle myself or works by contemporary authors but to acknowledge that their complex and fanciful efforts are unknowingly rooted in techniques pioneered in prior decades under more difficult and limited technological circumstances. Future iterations of the genre may not depend on this history but can hopefully learn from it. In the prehistoric era authors not only needed to come up with an idea for a work but often had to build it from scratch.

But is a *new* look and vision for writing really happening? The various attributes of works discussed in my study unquestionably demonstrate that the aesthetic and mechanical foundations of the form often differ from written works and present some fascinating ideas. One cannot successfully argue, however, that the works produced for the WWW radically advance poetic form. Models of works in each of the major areas of the genre—text

generation, visual enactments, hypertext—had already been presented in nondigital forms. Dadaists had presented randomized and graphical poems; concrete poets and others modernized visual poetry. Charles Bernstein writes in a statement titled "Alphabeta" that significant if not superior hypertextual poems had been conceived and published without computers: "While hypertext may seem like a particular innovation of computer processing, since data on a computer does not have to be accessed sequentially (which is to say it is 'randomly' accessible), it becomes a compensatory access tool partly because you can't flip through a data base the way you can flip through pages or index cards." Bernstein refers to Robert Grenier's poem "Sentences" (1978), which was printed on five hundred cards, as an example of an effective hypertextual poem that works manually, in which the reader can perform multiple types of reading. Bernstein's remark suggests that, while often impressive in technological sophistication, hypertext software and programming performs tasks that can be accomplished without digital tools and that there may be drawbacks to delivering texts technologically.

Moving Outside

The technological medium, however, presents intertextual possibilities that Grenier's "Sentences" cannot. My 1996 essay "Toward a Literature Moving Outside Itself: The Beginnings of Hypermedia Poetry" was transformed into an online compilation proposed as a "Proto-Anthology" because I felt it was an indication of the style of online literary/arts publications that would and momentarily did—in Sanford, Stone cited above—result from the advent of the WWW. The project and essay primarily suggested that electronic literature is not a self-contained form. The now-partially active "Proto-Anthology" site begins with the essay, which links to significant references.[13] Initially, every link led to an index of URLs compiled via a search engine; the index page for each reference also included a mechanism by which readers could easily send or suggest links. Another idea was that the contents should change and grow: "Everything in this essay needs to be expanded; additions and revisions will be made." The HTML/online version ignited such an expansion, though admittedly few revisions have been made to the online edition in recent years.

To solidify my views of both the possibilities and limitations of digital poetry, I recall my earlier views on hypermedia poetry productions and use them to offer a progress report for the genre. Classifying the digital poetry

that was being produced in 1996, I wrote in "Toward a Literature Moving Outside Itself" that "poetry which uses a computer screen as hypertextual interface" fell into at least one of five categories: hypermedia, HyperCard, hypertext, network hypermedia, or text-generating software (221). It was my view that in addition to whatever virtual inventions came along, electronic poetry would continue to exist as a conglomeration of different types of materials stemming from these five categories; the essay predicted a proliferation of multimedia, hypertextual stagings of literary texts. To some degree this framework has weathered the technological and formal developments that have come since then. As a broad outline the rudimentary categories stated above more or less pertain to the strands of digital poetry outlined by mIEKAL aND on the E-Poetry listserv following the 2003 E-Poetry festival: "programming, evispo, soundpoetry, text, typography & codework." In other ways the classifications are premature. Before the WWW, more offline works (diskette, CD-ROM) were produced. Now hypermedia, hypertext, and network hypermedia are essentially all the same. HyperCard, which is a particular piece of software, is going to be either hypertext or hypermedia and does not need a category of its own (it has also become somewhat obsolete). In any event the genre is clearly a plurality; works created in it branch from these stems.

In 1996 it was my view that very little creative advancement was emerging from some styles of digital poetry being produced, though I admit I hadn't fully considered the infinitude of text generators. By not exploring and exploiting the options available for hypertext and hypermedia, the form appeared to be somehow cheating itself. Decontextualizing works, "leaving the reader with little post-textual substance to follow up on," struck me as "a glaringly antiquated way to present literature in this supposedly expanded form," when hypertext enables literal and mechanical intertextuality (222). Digital media has unquestionably made an impact on poetry over time. Many artists and critics have created and analyzed works, yet the form is still largely insular. I always return to Ted Nelson's concept of hypertext as connecting *everything* and am disappointed in the glaring neglect of this pursuit, but I realize that this metaconnection may come at a later juncture in the form's development. Practical manifestations of Nelson's vision of hypermedia now have the potential to become manifest in hypervideo, virtual poetry, holopoetry, and formations of animated texts, but the branching qualities Nelson envisioned have not been widely cultivated. At this point I want to continue to promote the idea that digital technology enables

a poetic literature that effectively "moves" "outside" itself. There are multiple channels through which to implement this type of practice, which indeed furthers the idea of a "poetry in motion"; the equipment's capabilities could be used to extend the historical limitations of discretely produced literary titles. Programming, as well as the use of networks and software, can be used to create an environment that emulates the complexities of poetry. This would allow mechanically linking texts to exterior sources and bringing together texts of disparate origin into a hybridized articulation.

Poetry that embodies qualities of separateness, or is built on quickly shifting grounds, is not a new idea. A powerful example of this dynamic is found in poems written by Jack Spicer, who, as Robin Blaser observes in his essay "The Practice of Outside," was intent on creating a "new morphology" in his poems. Spicer wrote of his poetry as a "compound of the invisible and visible" (Blaser 276).[14] Spicer not only allowed for, but insisted on, openness to outside forces, something beyond oneself, as a key element in the process of writing (or what Blaser calls "the performance of language"); it was a combination of elements that made his poems "real" (295). Spicer's sense of "outside," propelled by "lively" language, writes Blaser, "pushes us into a polarity and experienced dialect with something other than ourselves" (275). A digital poem—which has the apparatus to mechanically do this—can benefit by forging dialects with other texts. This is already accomplished to a minimal degree by including images, sounds, and links; when a more extensive body of materials is synthesized, the effect of breaking with, and reforming, texts will be greatly heightened. Certainly performative and visible qualities of language are overstated by the media used by digital poets, which are in fact enabled by the implementation of invisible computer coding. Thus, a combination of texts already makes digital poetry real; this is certainly true in Cayley's work and in many other productions. The next step would be to inscribe these works directly into the larger "docuverse" (Nelson's expression for "universe of documents" in *Literary Machines* [4/15]).[15]

For Spicer "the insistence upon an outside becomes an intricate argument for transcendence" (Blaser 276). Finally, it may be I want to experience a sense of transcendence in digital poetry, a desire that has not been met with any regularity.[16] "The poetic, where it breaks out of the ordinary discourse and is either too elemental or too visionary," writes Blaser, "will have a life of its own and be true to itself" (302). Unfortunately, until new forms

of practice take hold, digital poetry will probably continue to progress as an extension of historical practice.

In the aforementioned 1996 essay, I proposed the notion of "biodirectional—that is, living—links, where the reader, interacting with literature, can access an ever-building network of related texts" (223). One can organize materials through Internet portals, using multilayered menus or amendable indexes and search engines, to advance the utility and purposes of any text. This method might work better in theory than in practice. Among other problems with contemporary systems, an author or editor usually loses control over the direction a text takes on the other end of the links. Development of work using XML—and systems that employ XML, like wiki—has begun to make this less of an issue, though by default users of wiki must contend with potential erasures or distortions and keep copies of any important texts.[17]

Insular productions are too common and depend too much on an antiquated model of textuality. Though the technology is available, digital poets have not seriously begun to push outward to texts beyond their own authorship. Obviously, when a piece of writing links to a graphic image, or vice versa, it is linking to something "beyond" itself. I am not referring to this kind of intertextuality but to the potential of using myriad links to put the literature into a developed zone of interconnected digital materials. World Wide Web search engines indirectly emulate this idea. Since poets have always intertextually reflected the world before them, why limit texts to discrete, fixed entities? Most approaches to, and treatments of, digital poetry are situated well within the boundaries of print culture and methodology. In most works it is difficult to find any sort of radical reconceptualization of reading or writing. Bolter has compared electronic text with oral text, suggesting in the first edition of *Writing Space* a refreshing dynamic in which the "reader participates in calling forth and defining the text of each particular reading" (59). This is true with regard to generated texts and perhaps with hypertext, but it is not necessarily a characteristic of digital poetry as seen in the WWW works reviewed here, which are often assembled by the artist and projected onto an audience. To truly advance, electronic (or digital) poetry must find a way to weave itself into a much larger textual context. Just as the book feeds the mind (and perhaps stimulates other parts of the body) via the page, computer texts will fill the senses with other stimuli as moving images, sounds, and links become part of the text. Rather

than containing its captivating qualities between its own pages, poetry in the future places itself centrifugally into worlds of secondary texts. A decentralization can then occur, where a poem—and the culture of a poem—is analyzed in terms of its links.

Alas, such a lofty vision for the genre is perhaps naive. Being able to access all of an author's works (words, images, video, etc.) at once, or to link from any text to any text, or even to link between versions of output created by text generators would, however, be rewarding and useful. Such characteristics could heighten the purpose of any poem, which is to transform. Since a poem is always attached to other things, a mechanization of this condition seems appropriate. What if digital networks allowed a type of automatic interassociation and textual malleability in which the viewer, in conjunction with any source, tangibly fuses her or his own textual experience both inside and outside the poem? Widely linked, mutable, interactive, visceral, visually imbricate poetry is a meaningful standard that the genre may eventually achieve.

If the genre has progressed at all, it is in two areas: the advancement of cybertext and the cultivation of instantaneous hyperlinked discourse through weblogs ("blogs"; see chapter 4n10). That said, the formation of virtual communities associated with blogging is not particularly new; in the early 1990s listservers functioned in a similar manner (without the ability to make links), as did BBS on the WELL nearly two decades earlier (chapter 4). Very few ergodic works have been produced, despite the increased availability and advancements of technology in recent years and formidable efforts by many artists, both before and since the WWW. In general, the reader remains an audience rather than a participant. In the previously referenced dialogue between Wershler-Henry and Stefans, Wershler-Henry writes with regard to the presentation of Stefans's kinetic digital poetry: "We have to move into a third realm—interactivity—before we can see the real potential of animation" (32). The implementation of interactivity has been a stated priority for many artists, and though it has been cultivated with sophistication by some, further attention to this trait will elevate the genre's profile.

Cybertext

In *The Human Use of Human Beings* Norbert Weiner writes, "Feedback is a method of controlling a system by reinserting into it the results of its past

performance. . . . If the information which proceeds backward from the performance is able to change the general method and pattern of performance, we have a process which may well be called learning" (84). Espen Aarseth's notion of cybertext, introduced in the book *Cybertext: Perspectives on Ergodic Literature,* may accelerate developments in digital poetry—not as a style or form of text but, rather, as "a perspective on all forms of textuality" (18). Defining cybertext, Aarseth returns to the origination of the *cyber-* prefix in Weiner's concept of cybernetics. At its root and essence cybernetics is a "system that contains an information feedback loop" (1). Aarseth defines *cybertext* as a specific type of dynamism where the reader/viewer makes selective movements to effect a semiotic sequence, where "nontrivial effort is required to allow the reader to traverse the text" as ergodic literature (1).[18] In other words, more than clicking on a link (or, analogously, turning the pages of a book) is required to traverse an ergodic text. An information feedback loop is the inscription of an input mechanism that leads to output particular to the present reader, a type of openly structured call and response or process of ongoing decision and result. Cybertext transactions focus attention on the reader, calling for intervention and response, rather than (or in addition to) interpretation. Through creative and experimental application in any medium (paper, radio, television, computer monitor, etc.), cybertext makes the viewer a driving force, with narrative control. Aarseth writes: "The cybertext reader *is* a player, a gambler; the cybertext *is* a game-world or world-game; it *is* possible to explore, get lost, and discover secret paths in these texts, not metaphorically, but through the topological structures of the textual machinery" (4). Within his general concept Aarseth has developed an intricate and thorough typology, with which readers can make distinctions among types of works created in any media. Aarseth's typology is complex; he introduces concepts and terms in order to identify, discuss, and chart the most tangible aspects of any text.[19] Understanding this system could advance the dynamics of digital poetry; its potential application, however, will have to be the subject of another book.

For now, I only fleetingly introduce the concept, in part to suggest that "cyberpoetry" does not necessarily qualify as cybertext if the reader's input makes little impact on the poem's construction. I believe that a wider, more active understanding of cybertext will lead to enlivened digital experience, as well as reconfigured approaches to learning. A self-mutating, digitized form of literature is possible. Aiming to remove an author's (one-sided) perspective from the textual creation, it mechanically opens up the ability for

a digital body of work to contain or develop multiple perspectives of its own or those stated by others. Cybertext is a much more personal form of digital communication than hypertext, which is nearly always impersonal. Though not yet pervasive, a range of ergodic texts will develop as our literary practices change. Cybertext authors or editors will create the environment, characters, and other aspects of narrative (or let the reader do it) in which the feedback loop between the text and the viewer is entirely spontaneous and instinct driven.

How are feedback loops presented, and how much Weinerian "cyber-" exists in digital poetry? Are they an important factor in determining whether digital poems succeed as art? Stefans, in *Fashionable Noise,* argues that computer poems are cybertextual insofar as a "reader/writer contract" is proposed by such poems (127). Viewers activate the work and connect with it as participants. Cybertext is less evident in prehistoric hypertext works, as the linking structures are generally fixed (even if multiple navigational layers are present), though I am not suggesting they wholly lack complexity and energy. Cybertext is technically challenging to design, which partially explains the predominance of interlinked, linear work in today's WWW environment. Linking, however, unquestionably remains a formidable dynamic in electronic textuality.

By choice and circumstance we stare at the product of links, wired or wireless, as metaphorical mineral conductors of texts in the historical present. From this vantage point we see that all digital poetry involves some type of link. In hypertext the link (as in node-to-node connection) is the primary mechanism by which a reader negotiates text. In graphical and multimedia poems (which foreground sonic and visual elements) different elements of the works are composed together as simultaneities. Text generators present another type of linking, between the algorithm or program and the text as it comes to the reader. Links—literal or conceptual—are always present in this extended environment; the activation of computer coding creates a textual spark that is the foundation on which any digital poem is built. The surface of the work appears as a result of the links between directions in the code.

With cybertext the objective is to broaden and multiply dynamic, steady but mutable, multidirectional links. The moment of initiation is mercurial for viewers—it brings something to them or brings them to something, and the keyboard and screen are launching points for display and engagement. The manifestation of text or the activation of materials involves intermedi-

ary interaction. To maneuver through three-dimensional space is to link to nodes within the screen's vectors or grids, and perhaps—via hypertext—beyond. The act of linking, ephemeral and delicate as it may be, is what makes digital poems work. With aural-oral materials links emit from screen and through speaker as multisensory interconnection. "Cyber-" dynamism may not be essential to the success of any piece of projected digital poetry, but as cybertext is more widely understood—and it is becoming so—it is likely that more vibrant interactive literary texts will emerge. All the same, Aarseth suggests, "it is necessary to dispose of the poetics of narrative literature" in order to develop new genres, and "efforts in computer-generated literature should focus on the computer as a literary instrument" (141). Not that art needs to emerge from theory, but this particular awareness of expansive textual dynamics will inevitably have an impact on the way poets and media artists present their work.[20]

In the subtitle of his 1991 essay "Poetics and Hypertext" Jim Rosenberg asked, "Where Are the Hypertext Poets?" They arrived a mere five years later, with the advent of the WWW (much earlier than the "decade or two" Rosenberg had predicted). At this time we can paraphrase the question: "Where are the cybertext poets?" Even though cybertext is a recent concept, this question is somewhat rhetorical. We needn't wait a decade for primitive cybertexts—a few examples are shown in previous chapters, and a number of artists are building works that emphasize viewer participation and control.

John Cayley's most recent works are remarkably advanced in comparison with his previous titles, as he now also inscribes a type of "live" transformation and transfiguration of text on the screen, sometimes in addition to holographic effects, thus combining the visual and generative possibilities for poetic expression (both of which are viewer controlled). Though Cayley has not yet reached the point at which his poems enable viewers to enter verbal or visual content (which would be tremendously difficult given the complexity of programming and media he uses), he has steadily produced prolific cybertextual works in which viewers control what happens on the screen. One poem in this vein is *riverIsland* (2003), which, Cayley's WWW site reports, is "a navigable text movie composed from transliteral morphs with (some) interliteral graphic morphs." As before (e.g., "hologography"; see chapter 3), Cayley has had to invent original nomenclature to classify the procedures used in his productions. Toward defining the first of these new concepts (i.e., transliteral morphs) on the *riverIsland* WWW site Cayley

writes, "If texts are laid out in a regular grid, as a table of letters, one table for the source and one table for the target, to morph transliterally from one text (one table of letters) to another, is to work out, letter-by-letter, how the source letters will become the target ones." Letters and words in various languages, plotted in the center of the screen, gradually change, one letter at a time. Various patterns emerge in this morphing, giving the in-between iterations of language many different appearances, because the many shifts between texts do not occur sequentially. Built with HyperCard, *riverIsland* unites different movies and soundtracks in two different visual fields, which the viewer negotiates through Cayley's programmatic application. A sequence of sixteen poems is arranged in a "horizontal" loop consisting of Cayley's poetic adaptations of sixteen quatrains by Wang Wei. The sixteen texts in the vertical loop are all based on one of the poems in the same sequence, which is shown at the beginning of *riverIsland;* variations in this second loop include alternative translations of the poem. The work is controlled in two ways: either by two mapped images or by positioning the mouse over compass arrows shown on the screen. To move between texts, "by way of an on-the-fly transliteral morph," the viewer leaves the mouse pointer atop an arrow key. A second method of navigation is achieved by dragging one of the two movies shown on the bottom and on the left of the screen. Textual positioning is achieved by altering the perspective from which one sees the movie (or given image). Changes in the audio, which consist of multiple voices speaking in several languages, as well as water sounds, also occur as a result of repositioning. Once the visual positions are established, the shown text begins to shift, morphing to the corresponding position as specified by the viewer's input. Essentially, the programming enables the viewer to move between randomly selected points in either sequence and then watch as the corresponding poem evolves out of the poem that preceded it. Another dimension of the poem—which beyond its aesthetic qualities addresses the materiality (or "atomic structure") of language—is presented here as a movie that uses the aforementioned "interliteral graphic morphs" to blend a series of depictions in different alphabetic and other systems of inscription of the character "kong" (or "empty"). Cayley's *riverIsland* is in part a rumination on the possible emptiness of any experience (implying void or nonpresence rather than something vacuous or without content), but it also recognizes the potential for words to be empty (through an imposed detachment from one another), and the possibility for language to be regenerated in alternative forms with variant mean-

ings. The overall emptiness embodied in the verbal content of this work coincides harmoniously with the media that project manipulated audio and visual materials; the elements (combined and on their own) are crafted so as to invite contemplation. As seen previously in Györi's 3-D work (chapter 3), the viewer encounters a plotted, interconnected set of materials through which he or she visually navigates, guiding the experience while the computer program controls the textual angle from which the visual materials are viewed.

Other texts moving toward a cybertextual mode at the 2003 E-Poetry festival included Sandy Baldwin's "New Word Order"[21] (fig. 5.3). This piece explores and emphasizes three dimensions of virtual space interactively, as the reader can direct her or his own movement through the visually oriented poem. Unlike earlier works, such as Dutey's "The Text Eater" (chapter 2), where the "player" of the poem looks down on flat words, Baldwin's poem transpires while suspended in architecturally rendered rooms inside a building. He usurps the code from the popular (and violent) computer game *Half-Life,* transforming it and filling it with language. The computer screen projects three-dimensional text as readable passages that are presented in a sequence of virtual rooms. At points Baldwin's poems employ the game's death-world ontology: in the second and more dynamic room, titled "New Word Order," words of a Billy Collins poem are lined up in the space. In what can be read as a critique of the traditional style of Collins's work, a player uses a virtual crowbar and hand grenades to destroy or reconfigure style to his or her own liking. The work of the viewer in such a unique and unconventional text is obviously significant. In order to proceed, the viewer must learn how to interact with the poem and make his or her own choices within it. The base text (Collins's poem) is the same for all readers. The next cybertextual step for a work like this would be to allow the viewers to insert and reconstruct text(s) into the "game," or perhaps add rooms onto the building, as anyone can do in MOO space (see chapter 4).

Giselle Beiguelman has created several pieces that contain cybertextual elements, including "WOP Art" (2001) (WOP = wireless operation protocol), "Tele-intervention," and "Progress." These works are telecommunications-art projects in which "real" space, such as the electronic billboards of São Paulo, are programmed in real time via cellular telephones and other portable devices so that interface surfaces multiply and influence each other. Using display methods similar to those used by Julio Plaza and others, Beiguelman brings multiple nonphonetic wired and wireless technologies to-

Fig. 5.3. Sandy Baldwin. Screenshot (Dec. 19, 2003) from "New Word Order."

gether; her program unites code, numbers, and new languages that are open to reformation. Her pieces concern reading practices, require new forms of creative processes, and promote expression in cooperative environments. Beiguelman has also produced several WWW projects that demonstrate cybertext qualities and explore the difference between interface and surface. "Ceci n'est pas un nike" is an interactive piece in which users can wildly distort and then preserve their iterations of her representation of a sneaker and the title phrase (the mutations are collected in a database for others to view), as in figure 5.4.

In "Grafitis" Beiguelman again interfaces with electronic billboards (i.e., commercial space): a user selects from graffiti symbols available on her Web site that output onto billboards as interventions between commercial messages. In "egoscope" URLs are sent through her Web site to a billboard and in turn are broadcast on the Internet via webcam. In "poetrica," created specifically for mobile devices, the user creates unique personalized patterns with fonts or symbols provided by Beiguelman. All of these works require atypical action and interaction on the part of the reader, who becomes directly responsible for what is transmitted in the poem.

Jean-Pierre Balpe, now working in his third decade as a computer poet, stated at E-Poetry 2003 that digital text has no respect for strict laws but has multiple possibilities: it is no longer fixed, definitive, linear, always the same. In his view digital poetry represents a trembling inside language, a vacilla-

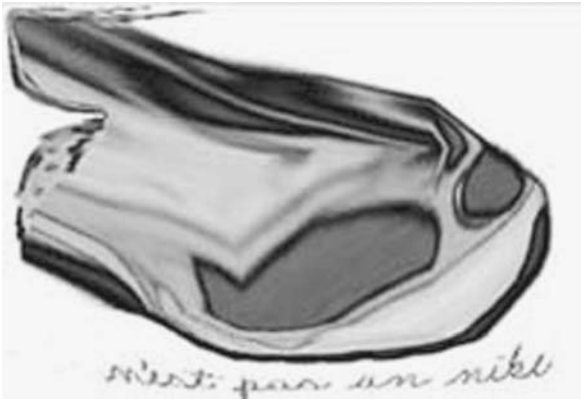

Fig. 5.4. Giselle Beiguelman. Screenshot (Sep. 25, 2003) from "ceci n'est pas un nike" <http://www.desvirtual.com/nike>. Distortion by C. Funkhouser.

tion allowed by media on the borderline of what media can do. Digital poems rely on variation of text; language is a force in multiple ways. Balpe, as noted previously, characterizes digital poems not as eternal but as infinite. His text generators operate in real time, writing poems from a simple dictionary. The user gives information to the program, converses with it; each text, he writes in the essay "E-Poetry" "becomes an announcement of other possible texts" (5). Balpe's generators make semantic and grammatical sense and are available in several languages. He claims that they are never abstract, that "meaning is always embedded in the objects of language" (5). In "Choisir dans trajectories" Balpe uses pull-down menus with different themes (and dictionaries): ninety-six different databases, each presenting its own range of possible meanings. The user provides input that affects the tone of the piece; the machine manipulates data in a mini-generator. "Choisir dans trajectories" is computational poetry: language (in the dictionary) is shuffled by algorithm, making output containing syntax. In "Générateurs" he wrote a program that created poems dedicated to each person participating in the festival. In addition to text generators, Balpe has created participatory installation pieces. At E-Poetry he showed the video documentation of a complex/dense museum installation in Mexico called "Metápolis" (2002). This area of his work features large projections with which the viewer interacts via tabletop hand sensors—images, kinetic words, animation, and sound—to make a multidimensional environment in a large public space.

Tammy McGovern showed several visually oriented poems at E-Poetry 2003, which consist of random letters, words, images, and sometimes sounds that are activated by touching the keyboard. The keyboard is used as the instrument to make poetry. She suggested that the work is not performative but rather private and personal. The words in one piece are based in nursery rhymes; another piece is made of multiple thumbnail videos in motion. By using several programs to produce the work, McGovern has formulated her own (hybridized) poetry software and makes the hardware into an evocative, curiosity-raising poetry machine. Patrick-Henri Burgaud also demonstrated his CD-ROM "Orphee Aphone," a piece heavily influenced by mythology, geography, and literature. In this interactive work the viewer is challenged to find a path—an intellectual and creative approach to virtual computer games like *Myst*—by answering questions and navigating a demanding multimedia trail via mouse and keyboard. The user is most important, "is in the main position," commented Burgaud while introducing the piece at the festival, and cannot finish making the poem without completing the required tasks.

Maria Mencia has cultivated equally enthralling works that the viewer engages without the sort of objective restrictions inscribed by Burgaud. At E-Poetry 2003 Mencia showed interactive works that involve the invention of new media language along the lines of intermedia, particularly with her use of images and sound.[22] For example, "Another Kind of Language" is user-driven work (input via mouse), mixing the sounds and appearances of three languages (Arabic, Chinese, English) to create narrative. The work appears as a blank screen until the viewer discovers that he or she can create trails of images and sounds by moving the mouse. Mencia has also developed another painting-style piece called "Visualeyes." In this work the user makes drawings and creates images in color on the screen (using mouse and or iris-tracking devices) and is also able to activate sound (in different languages). In Mencia's *Birds Singing Other Birds Songs* (fig. 5.5), bird songs are transposed to human voices. Choosing from a palette of possibilities, the user activates likenesses of birds that "fly" on the screen while voices sing associated songs; the virtual birds also leave a trail of language atop a backdrop of virtual clouds.

I have overseen two cybertext poetry projects that lack in graphical characteristics but invite readers to enter text alongside words from a given database.[23] A student project, Jose Chua's "Synchronicity" (1999) is a unique device. It employs a very simple interface, in which the viewer is given three basic controls (an enter button, text-entry field, and stop button) to con-

Fig. 5.5. Maria Mencia. Screenshot (Sep. 26, 2003) from *Birds Singing Other Birds Songs* <http://www.m.mencia.freeuk.com>.

struct a poem. Using JavaScript, Chua created a database of words that appear in random order and move around the screen once the viewer has called for them by using the enter button. Stopping the motion of the poetry freezes the poem in place; at this point the poetry can be captured by pressing the "print screen" key on the viewer's keyboard. The viewer may enter her or his own text into the mix at any time through the text-entry field, to which she or he can affix any sort of HTML coding, thereby altering the appearance and dynamics of the text. During the composition of the poem the viewer's input is verbal, visual, and cumulative (if temporarily so, as a user's input is not entered into the permanent database). The program can be used as a self-contained mechanism or altered by users to embed external texts. For example, by typing in an HTML "<a href>" link into the input box, the viewer—who is a coauthor—can direct the contents to other resources. This sort of partially preprogrammed, partially arbitrary, and par-

tially interactive method is but one of the many possible approaches to building digital poetry with contemporary database programming.

In 2002, in collaboration with a student named George Taylor, I launched "Moby-Dick," an interactive, partially kinetic piece that contains aleatoric functions and allows viewers to enter their own input according to preestablished parameters. At first several acrostic poems written in a notebook are presented in plain text on the screen.[24] Then these eight-line, eight-word poems shuffle into new permutations within the same verbal acrostic. A JavaScript randomly rearranges the original sixty-four words and automatically renews the text every five seconds. In my view some of the recreations surpass the original poems (which were, in fact, aural cut-ups based on Herman Melville's words). At the next, and final, level the information is ergodically reprogrammed to allow readers to contribute verbal content. The original association with Melville's book is unlikely to be sustained in this interactive version, as contributors are not likely to reflect on (and probably will not recite from or listen to) *Moby Dick* as they input words. This is a secondary and perhaps irrelevant point. Since so many human predicaments are encompassed in the novel, I believe that any words that enter the poem are relevant to the intent of the piece. This experiment is part display, part investigation into the mechanics of the acrostic form, part reading game.

In *A ciberliteratura* Pedro Barbosa astutely addresses digital poetry's new forms of producing and receiving messages and—in a passage of the book translated by Jorge Luiz Antonio—states the importance of the viewer as catalyst and participant:

> At last the literary message (poetic or narrative) structurally assumes itself as *open work*—in the potential and interactive modalities. This fact implies the participation of the "user" (operator of the computer program) for giving verbal existence to the literary message. Well, being the message constituted by the reader and operator's options in the context of a sometimes infinite labyrinth of reading ways, any final text finished by this way is also a personalized emanation of the operator of the program; and such emanation is added when the program gives him/her the possibility of intervening, modifying or rewriting the potentially proposed text. (233)

The rise of participatory texts is crucial to the growth of digital poetry—we can certainly explore beyond overly simplistic tools such as Your Personal

Poet (see chapter 1n41). The WWW and other mechanisms hold possibilities for cybertext or advanced and unusual digital poetry. Further development of wiki systems, celebrated by mIEKAL aND at E-Poetry 2003, may be an interim step toward the collaborative creation of mutable texts. When virtual objects become more easily programmable (and reprogrammable), they will be even more powerful. Developing an expanded understanding of textuality is an important step toward the creation of distinctive digital literature. Keep in mind what Dick Higgins wrote in *Computers for the Arts* in 1968: "The onus is on the artist, not his tools, to do good work" (17). It is more likely, however, that the "onus" falls equally on the machine and the programmer-hardware-software combination to produce profound works.

Conclusion

Poetry as it is known historically will never completely change into a digital form; it will continue to exist as it has—as myriad spoken, written, and other textual formulations alongside computerized counterparts. Poetry in its traditional form may never take the shape of a video game because video games as we know them in popular form (i.e., lots of rapid-fire action, to which the player physically responds) are antithetical to the purposes of a certain style of poem. Poetry in oral and written forms has developed a history, we must presume, because it appeals to deeply ingrained human sensibilities with its often metrical presentation of language that pleases the reader's emotion, intellect, and imagination. A large audience might consume a technologically complex digital poem produced as a video game, but that text is going to be vastly different from something in the anthologies heretofore published by W. W. Norton. Given a new set of stimuli—a slower pace of presentation, materials absorbed as words and artwork—the typical video-game audience might change its tastes, but I do not see those radically different modes ever conjoining in titles that reach a high level of popularity in mass culture. Poets will build poetry-based games, I am sure—perhaps they will allow for real-time encounters with texts, possibly in multiuser interactive environments—yet their scale and purposes will differ vastly from what is available in arcades. These titles would be an educational tool and may have an influence on the circulation of ideas and level of visibility of conventional poetic works; their production should be encouraged.[25]

In his last piece of writing, published in the *Washington Post* the day after his death in 1969, Jack Kerouac wrote that "if Marshall McLuhan had

wanted to be the biggest barbarianizing influence in the globe he couldn't have come up with a better idea . . . than that linear reasonableness of the printed word is out." (B1). I disagree with Kerouac—the linear reasonableness of the printed word was barbarianized long ago. While there are obviously problems with nonlinear literature, contemporary computer mechanisms hold promise and utility for poetry if works are designed and constructed with diligence. Many people who now work toward the preservation and promotion of vibrant digital literature do not perceive it as fragmentary, unauthoritative, or the ball and chain of an invisible emperor that takes away our time and spirit. One should expect, if not demand, a different type of experience from a form that enables sounds, images, and links between different texts to appear before a reader's eyes. The substance of the text depends on its medium, and when hypermedia draws together its best elements, it will bring digital poetry to a much larger textual level. Ultimately, codes and the authors who use them effectively will initiate an expanded understanding of textuality, an important step toward the creation of a new literature in the realm of computer and network media.

Digital poetry, in spite of its general parameters, contains many variables and approaches and is constantly being redefined. While I believe that the basis for digital poems will always be text generation, visually oriented works, and hypertext, their implementation and integration into works will continue to develop. In the 1970s very rudimentary kinetic poems by Arthur Layzer streaked down a computer terminal; in the 1980s the same approach was developed and technically refined by Melo e Castro in his Infopoems and by hypermedia works created and published by Bootz and in *Alire*. A few years later, the multimedia program Macromedia Flash brought these effects to the WWW, as in *the dreamlife of letters*. New technologies will drive new discoveries in kinetic poetry. Cybertext and the cultivation of hypertext on a larger scale are the ripest areas for advancement. I feel confident in predicting that, instead of texts presented on cards or in separate files that contain preprogrammed links, database technology will be used to construct hypertext works and will allow readers even more ability to control the narrative.

Digital poetry is intensive work in both creation and consumption. Producing a single publication requires labor, sometimes hundreds of hours. Interpreting and exploring a publication's contents can also be demanding for users who bolster, enhance, personalize, and complicate texts during compositional interactivity. An interactive text that requires coprocessing,

thoughtful effort atop thoughtful effort, does not guarantee pleasing results but can strengthen and diversify the articulation of a digital poem. In one of his earliest writings regarding computers, John Cage suggests in *A Year from Monday:* "What we need is a computer that isn't labor-saving but which increases the work for us to do, that puns (this is McLuhan's idea) as well as Joyce revealing bridges (this is Brown's idea) where we thought there weren't any, turns us (my idea) not 'on' but into artists" (50).

In the essay "Once upon a Computer . . . ," published in 1977, Carole Spearin McCauley wrote: "I don't predict a great future community among writers, computers, and computer programmers. Computer time is expensive, few writers are yet their own programmers, and programmers may not possess the kind of minds that want to produce creative literature. Literary experimentation can be an uncertain process, requiring the species of poetic, unprosaic mind that is happy with unfixed parameters, serendipitous juxtapositions, no-definite-end-goal-from-the-beginning" (109). Many years later McCauley's vision remains only partially valid, as many poets can now develop works because the technology is accessible, and the gulf between poet and programmer has diminished. Of course, McCauley had no way of knowing how radically the computing industry would change, with developments in hardware, software, networks that gave rise to many interwoven communities, and an environment in which a poet could, with a reasonable investment of time and capital, produce computerized poetry. Digital poetry has not earned a place in popular culture but has its own subculture that is steadily growing and diversifying.

In her study *Computers and Creativity* McCauley raises two other points worth reiterating and considering. "The computer's programming, which seems rigid," she writes, "actually becomes a freer mold than the confines of English grammar, syntax, and common usage" (113). In digital poems in which the performance of the language is programmed, this statement is as true as it was thirty years ago, even though visual works in all forms (animated, static, video) do not usually involve coding, as commands that inform the appearance of the text are built into a graphical user interface (GUI) provided by the software. Yet before 1990 almost all operations involved programming, and that poetry embodied various sorts of verbal freedom; ironically, the poems embraced that freedom almost to a detrimental degree—these randomized texts were usually perceived as inferior poetry or nonsense. Most hypertexts involve various degrees of programming, but in the HTML/WWW era authors have generally had the advan-

tage of working with graphical interfaces and programs that compose code according to the designer/programmer's instructions. When the digital poems reviewed here are unpredictable and imperfect, they are often refreshingly so, like Barbosa's *Syntext* programs. Using the screen for presentation has generally liberated poetry's appearance; in some (if not most) cases poetry is presented with a completely new look, particularly in the use of vibrant colors. McCauley speculates that the quality of "computer-assisted poetry . . . usually depends on the machine's power with such techniques as random-number generation, substitution, permutation of letters or word orders, and other transformation of syntax" (113). Today the power of machines has increased greatly, sometimes to the detriment of running programs at a readable speed, and artists now have their own personal computers. Her view is usefully dated, and we are able to see how computerized poetry has progressed beyond her concerns, and how it has not. With respect to hardware, the more powerful one's system is—as a producer or consumer—the more fluid and reliable the poem will be. Strikingly, McCauley omits two profoundly integral components, which cannot be understated: poetic imagination and vision. An artist who has access to the most powerful machines on the planet will find no use for them if he or she does not supply viable poetic ideas.

In my view computer science and creative expression have integrated well with one another, but digital poetry, despite the technological advancements in recent years, has not reached its optimum level of performance. Progress in all aspects of computing has led to complicated verbal and vibrant multimedia works that are far richer and more spectacular than the ASCII text of yore. Language is presented in alternative creative forms (sometimes generated, sometimes fixed), enhancing the visual qualities of texts. Viewers are presented with a stimulating and challenging textual scenario; these are the successes of digital poems.

Many years ago Arthur Layzer wrote in a short article titled "Poets, Birds, Snow, Kites, and the Computer" that "when the creative wind blows on the computer's personality, shapes it or melts it to an organic form that we recognize as humanly associated—takes the computer's personality outside of itself—we feel the significance of the human situation in a striking way" (111). Digital poets have not labored to experiment and invent out of cultural necessity or desperation; works have sprung from self-driven exploration of computer media and the individual desire to craft language with technology that, in turn, modulates and modifies traditional approaches to writing. The

computer has presented both a puzzle and formidable sounding board for poetic ideas and articulations. Since the very earliest works examined in this study, serious poets have explored computerized composition. Digital poetry was never wholly controlled by scientists but by writers—sometimes working with programmers—who labored to discover methods for inventively reformulating language.

In the brief discussion of the merits of film in *ABC of Reading,* Pound suggests that "in all cases one test will be, 'could this material have been made more efficient in some other medium?'" (76). It is not difficult to answer this question for the forms of digital poetry analyzed above. If efficiency is the barometer by which the medium is measured, the answer is no. While some noncomputerized works mirror digital dynamics—with arguably better results—the software used to craft these poems enables a streamlined implementation of creative expression. Poets can, and have, made hypertextual poems using a stack of cards, but that sort of analog interface is more difficult to negotiate than an ably programmed hypertext. More to the point, as Eduardo Kac observes in his introduction to *Visible Language* 30.2, "A new poetry for the next century must be developed in new media, simply because the textual aspirations of the authors cannot be physically realized in print" (100).

In this book the formative period of this technological genre has been covered, and important works by many artists are introduced. The most influential historical artistic models are identified, and an accurate account of digital poems created in the era before computing became ubiquitous is posited. I have also, however, sought to portray current trends, as well as critical and philosophical issues related to digital poetry. In concluding I wish to respond to a suggestion that appears in rjs's automatically generated *Energy Crisis Poems* (1974). Here the author writes that "the poet need not change his vision; he need only move forward or backward *in time* to achieve an innovation" (9). While looking backward and forward in time is certainly useful toward the advancement of digital poetry, I am inclined to offer this contemporary counterproposal: when poets compose with timelessness in mind, they will always be on the route to originality.

Appendix A

Codeworks

Codework is a term Alan Sondheim coined and develops in his introduction to a series of articles published in *American Book Review* in 2001; the label is used to describe productions that portray "the computer stirring into the text." The impetus in this deviation of form(s) is to appropriate computer language for uses outside of writing a program. Many works that incorporate the icons, metaphors, and terminology of computers and networks have emerged as a means not only to belie them but to subvert, critique, and manipulate these textual components and thus the medium and audience. On WWW sites such as *Betalab* and *JODI,* and in works by Christopher Filkins, these deconstructive characteristics are achieved by disorienting viewers with excessive graphics, animations, unconventional design (including unclear navigational principles), drawing links that reach dead or unlikely ends, and other programmatic foibles. Such works, writes Sondheim, "are both a deconstruction of the surface and of the dichotomy between the surface and the depth" in computer-based works. These works exist on the fringes of what this book considers digital poetry, and I admit that relatively few authors are involved with the practice of these methods. Even so, the poetic intent and force of such work is clear, despite a lack of standardized form.

Although Sondheim's 2001 taxonomy indicates that contemporary codeworks involve the manipulation of computerized works, the idea of "stirring" computer language into poetry is not new. Two early projects, Edwin Morgan's "Note on Simulated Computer Poems" (1968) and Archie Donald's "Timesharing: Conditional Jump" (1973) forecast poems that would later become known as "Codework." The graphical poems of Lionel Kearns, who later made some of the earliest animated poems, and André Vallias are also relevant to this discussion.

Kearns's visual poem "Birth of God/uniVerse" (fig. A.1), created in 1965 and later published in *By the Light of the Silvery McLune,* is the earliest example of a code

Fig. A.1. Lionel Kearns. "Birth of God/ uniVerse." *By the Light of the Silvery McLune: Media Parables, Poems, Signs, Gestures, and Other Assaults on the Interface* (Vancouver: Daylight P, 1969), 9.

poem that directly pertains to computers.[1] Using the most basic elements of binary systems, rather than elements of coded language itself or implementing code on the computer, Kearns fashions a simple yet striking image that suggests the close relationship that exists between text, image, and code in the new forms of contemporary expression. The poem, as Jim Andrews writes in the preface to his hypermedia study "About Lionel," is "extraordinary in its relevance to digital culture" and "generative of all things." As Geof Huth observed in a blog entry on this work titled "On 'On Lionel Kearns,' Jim Andrews, and Comsimplexcity," "at its core, this poem consists of nothing more than two digits, a 1 and a 0—but the 1 is made out of zeros whose central holes are 1's, and the 0 is made whole by a pattern of 1's. The central simplicity of this poem is created via a complex series of visual puns that engender a concatenated series of possible interpretations." Not only does the poet, to borrow Walt Whitman's phrase, "contain multitudes," but as indicated first in "The Birth of God," the poem—within itself—consists of information contained in multiple layers of surface and algorithmic language.

Whereas some of the previously discussed authors in *Cybernetic Serendipity* (see

introduction and chapters 1 and 2) showed examples of the code they used to generate poems, Morgan made simulated computer poems using some of the tenets of code. The poems were not created by a computer but rather by the poet, who borrows coding devices for his composition. In one example, "The Computer's First Birthday Card" (which appears in *Cybernetic Serendipity* and *Computer Poems*), the poem is formed as a rectangle vertical block, and its content contains formatting (italics) and lines that appear to contain binary code or random characters (e.g., "+$(!=0½†*/£["%1?"); the appearance of these arbitrary symbols and patterns denotes a pivotal point, where the language of the poem begins to shift in both content and style that exposes the binary, character-driven aspects of encoded expression (*Computer Poems* 41). The first half of this poem loosely permutes a short phrase through several lines until it becomes "many happier turns" (41). Reverberating language has here, in effect, a distinct technological sense to it, as in a word being sent through an electronic sound processor. Afterward, the poem begins to include question marks and exclamations (e.g., "er *error* er *check!*" and "*01 01 01 01 01 01 01?*") while dissolving into broken language and characters that form the lines until its conclusion. The penultimate line reverts to "many happy returns" then ends inquisitively (i.e., "eh?eh?eh?eh?eh?eh?" [41]). The poem is arranged so it returns to its "head" (to borrow a term from jazz improvisation) and then questions itself in the second half of the work. As the poem makes technical references, the reader might wonder whether or not the poem is questioning the pursuit of automatically producing poetry or is perhaps simply acknowledging the intervention of computing into literature. In his statement about the work in *Cybernetic Serendipity,* Morgan claims that his "goal seeking" poems use irony and comedy as a way of "drawing attention to some of the human/electronic relationships which will have to be investigated" (57). He also recalls that the development of computer technology arose out of work in cryptography during World War II. His observation that "a poem itself can be regarded as a coded message" is especially insightful and could be connected to any number of approaches to poetics (57). This is the first poem that I know of that repurposes computer language for creative purposes in print.

Archie Donald actually presents code, along with other technical information (including a "Glossary" that defines characters in the code), as part of his work (fig. A.2). This approach, synthesizing methodology (programming) and output, presents a different kind of technical puzzle for readers, each of whom would experience the poem depending on their knowledge of programming, or at least their ability to interpret the purpose of the document. For some readers this dimension will be an impediment; for others, it will add intrigue to the reading experience. In any case the provision offers insight into the programmatic structure of creative work that began to develop in earnest at this time.

A conventionally styled poem is not presented, though the lines that follow the supposed "Run" and "Wait" commands, "Once upon a time there were two bears," mark a shift in the tone of the content and begin a brief (less than half of the entire

TIMESHARING

Conditional Jump *A Basic Experience*
TIME ON 15:35 *LONDON B*

SYSTEM -------- BASIC
NEW OR OLD ---------- NEW
PROJECT ID -------- LOVEYU
PROGRAM -------- WELAST

READY

```
    1 LET X = YOU
    2 LET Y= ME
    3 LET X * Y = X, Y, C, D
    4 IF X > Y GO TO 11
    5 THEN IF X < Y GO TO 10
    6 IF X = Y
    7 PRINT "APPLE PIE"
    8 READ C,D
    9 GO TO 3
   10 PRINT "ONCE UPON A TIME THERE WERE
      TWO BEARS"
   11 PRINT "CHANGE PROGRAM"
   12 DATA INSERT
   20 NEXT

  999 STOP
```

RUN

WAIT

"ONCE UPON A TIME THERE WERE TWO BEARS"
? INTEGRATE
"NOW UPON A TIME THERE ARE THREE BEARS"
"NOW UPON A TIME THERE ARE THREE BEARS"
? AGAIN AGAIN AGAIN
"NOW HERE'S THE TIME WITH FOUR BEARS"
"NOW HERE'S THE TIME WITH FOUR BEARS"
"NOW HERE'S THE TIME WITH FORE BEARS"
? VALUE JUDGEMENT
TILL THE TIME COMES TO EXPAND
THEY ALL LIVE TOGETHER AS A VIABLE
FAMILY UNIT
? SAVE CONVERT TO PROGRAM 'EXPAND'

APPLE PIE
APPLE PIE
APPLE PIE
APPLE PIE

END
BYE

OFF AT 15:54 VALID TIME 24.8 SECS

GLOSSARY

> BIGGER THAN
< SMALLER THAN
* TIMES (MULTIPLIED BY)
? WHAT NEXT

IF READ ALOUD TWO VOICES SHOULD BE USED.
FLAT
CHEERFUL

Fig. A.2. Archie Donald. "Timesharing: Conditional Jump." Illustration in Bailey, *Computer Poems* (Drummond Island, MI: Potagannissing P, 1973), 10–11.

piece) section that is less technical but is still interrupted by what appears to be prompts or commands in BASIC language, such as, "? SAVE CONVERT TO PROGRAM 'EXPAND'" (11). This segment ends after the line "Apple Pie" finishes repeating. My studies in BASIC and consultations with expert programmers about this piece determine that the poem Donald presents is made with quasi-BASIC language, which would not "run" on a program compiler. The part of the text that we are led to believe is generated by the program is a contrivance that emulates the type of operations performed by computers. "Let," "Read," and "If/Then" statements are calculation commands that are part of the BASIC lexicon, appropriated by Donald to suggest a computer's effect on the poem. The poet has made the choices, however, not a computer, though only someone who has knowledge of BASIC would be able to tell the subtle problems related to the variables provided in this example. Programming language obviously influences the poet's expression, but the computer is only (indirectly) responsible for the output in that it gives the poet a new plausible (if eccentric) structure through which to transmit a message. As Bailey writes, this work is a "verbal orchestration" (n.p.). It is a poem that literally contains its own code, in the new sense of the term that directly incorporates computer language. Donald's puzzle presents a score made of words, visual symbols, and coding apparatus.

Interpreting the notion of a code poem from yet another angle, André Vallias profoundly cultivated the practical and theoretical development of digital poetry by developing interactive nonsemantic poems using AutoCad (a computer-aided design program customarily used by architects and engineers) in the early 1990s. Vallias rendered graphical "code" poems with topographical dimensions rather than verbal ones. The essay "We Have Not Understood Descartes" describes his "diagrammatic" model for digital work, the concept of the poem as an open diagram, "operating under the sign of diversity" (155). Instead of treating the palette as a blank page or slate, he likens the computer interface to a "black infinity" (152). Vallias, who cites concrete poetry as his "background and start point," uses multimedia to move beyond typographical experiments by integrating three-dimensional elements rather than the alphanumeric data into the syntax of the poem (email 2004). The result is the production of molten grids from alphabetic texts, which he calls "sinusoidal" forms that point to the "virtual interrelationship of codes" (154). These complex systems, used to produce "The Verse" (1991; see fig. A.3), which operates as both a poem and a model of poetics, present a radically different interpretation of the "contours" of a text as envisioned and promoted by Joyce, Bolter, and other hypertext theorists.[2] Vallias's method of materializing language as textured shapes is literal, not figurative, as seen in this representation.

Vallias's earliest work eschews language, seeking, he writes, "to go beyond the limits imposed by the linear nature of our society's hegemonic code of communication—the written text"; he believes poetry that appears in this manner is set free from logocentrism and recovers its primordial meaning of creation (154). "The Verse," initially a series of static surfaces that were later transformed into an interactive text

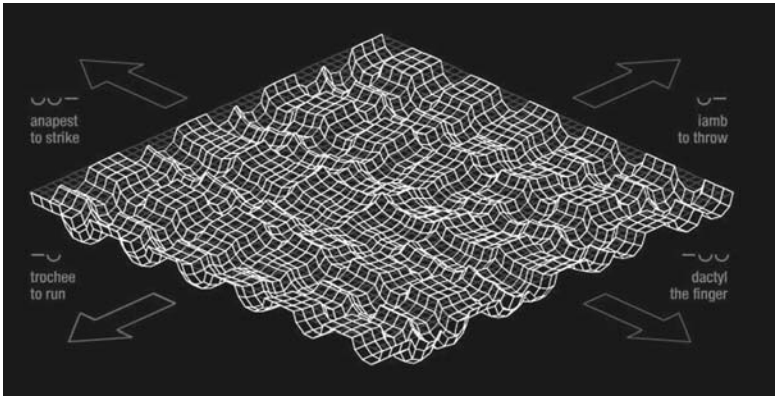

Fig. A.3. André Vallias. Illustration from "The Verse." Screenshot (May 4, 2004) of "trochee / to run, anapest / to strike, iamb / to throw, dactyl / the finger" taken from the author's WWW site, <http://www.andrevallias.com>.

on the WWW, uses graphical representations of the names of the metrical schemes found in accentual-syllabic poetry (trochee, iamb, dactyl, anapest) to show how a visual model of poetry can be built. The patterns are determined by the length of the syllabic content of these schemes and the author's combinations of the words. Figure A.3 shows the relatively basic graphical formation of the word *trochee,* though compound words and shapes, such as *dactyliambic* and *dactyliambanapest,* are also shown in "We Have Not Understood Descartes." A visual language is established; once learned, the understanding of the patterning could be used to interpret or read work. Figure A.3 shows what happens to the poem's grid when all of the verbal schemes are requested at once.

Though not explicitly discussed by Vallias, his graphical system could be applied to rhythmically visualize any word (or set of words) subject to scansion; it is a form of virtual, visual, even sonic, Braille that viewers "read" by absorbing graphical texts with verbal foundations. Viewers read by translating molting graphical texts that had verbal foundations. Among other values, "The Verse" illustrates that the more one asks of, and uses, language, the more complicated verbal formations become. The grids that demarcate works in "The Verse" also manifest as overt mutations of the ordinary flat page or screen on which words or poems are usually presented, in order to invent an "iconicity" that corresponds with the Greek terms used in the denotation of poetry (155).[3]

Such an aesthetic application of composition differs from anything else historically produced in the area of digital poetry. The approach taken by Vallias is more akin to the practices of avant-garde composers of the modern era, who often used standard musical notation and tools, such as the lines and spaces of the "staff," in

atypical and refreshing ways.[4] Vallias has discovered, as have others whose work is discussed in this study, yet another unconventional method for using the computer as a staging device for the integration of visual, acoustic, and numerical codes. The uniqueness of his project provides more evidence that there are multiple interpretations and possibilities for digital poetry than have been conceived and extensively, if singularly, explored. Words are transformed into shapes and structured so that verbal patterns (words) can be graphically constructed, though obviously a graphical narrative is preferred. In any case the point is not as much to develop a new language as to illustrate the multiple dimensions and potential dynamics held by the ones we already use. He urges the cultivation of interactivity, which "allows a work to be modified according to internal criteria (those defined in the programming language) and also according to the repertoire and interests of the reader" ("We Have Not Understood Descartes" 157). His views succinctly articulate the practical domain, if not the responsibilities, of contemporary digital productions. Though not all of his own works are interactive, Vallias's passionate statements serve as an ideal for the conditions of digital poetry.

The concept of a "code" poem was one of the many pursuits explored by the Brazilian concrete poets, though from an expressively different angle. In the concretist works a lexical key in the form of graphical symbols is provided by author or authors, and, in one of the best examples of this, Luiz Angelo Pinto's 1964 "code" poem is an arrangement of diagrams and is read accordingly, despite the absence of language in the work proper (forecasting digital works such as Vallias's). The objective of artists like Pinto and Décio Pignatari, as stated in their semiotic poetry manifesto of 1965, which is referenced in Williams's *An Anthology of Concrete Poetry,* was a view that conceived of a language in which visual signs "might be designed so as to determine the syntax of a work" rather than verbal signs (Williams, *Anthology* n.p.). The use of verbal expression in Donald's piece and the type of code poetry promoted by Sondheim are, however, a different category of "code" poem altogether. The works shown above are the earliest examples of computerized deconstruction of the surface of a poem. Thirty years later this practice is significantly activated by artists such as Sondheim, Mez, Ted Warnell, Florian Cramer, Talan Memmott, Kenji Siratori, Brian Lennon, Antiorp, and JODI, because the dichotomy between the poem (or writing in general) and code is diminished in contemporary production techniques.

The notion of *code* is relevant to works of poetic literature of all sorts. As Geof Huth writes in the aforementioned Visualizing Poetics blog entry,

> in the realm of media . . . the hegemony of the digital world of ones and zeros is nearly absolute. Whatever you see on your computer screen is digital. (The double bends of the s, which you see right here, can be reduced to digits—a series of nothings and barely somethings equaling a particular something, and a set of pixels upon a field that carve out a certain shape.) Whatever you

> see on any screen has probably existed in a digital form before it arrives at the back of your eyes as an image. Even today's books are analog manifestations that appear only after a digital gestation."

So many forms of expression revolve around developing an understanding of cultural codes and the treatment of technical codes. This does not mean, however, that literature requires the ostensible use of computer coding or even a precise understanding of how such coding functions. In "Codeworks" we see a mixture of codes, an unconventional form of expression that synthesizes coded language and computer code. Even though most of the authors working in this area are capable of writing computer code, the intent of this work is to bring the underpinnings of the endeavor to the surface.

Appendix B

Holography

During the late 1970s and 1980s Kac, Kostelanetz, and others pursued yet another approach to the technological presentation of language, new to the realm of poetry and new media, when they began to explore unconventional uses for holography. Kac's "holopoetry" is made and displayed holographically (i.e., the work is not composed in lines of verse and is made into a hologram); computer software is used to format words and images, but the work itself cannot be viewed on a computer screen. Using a technically complicated, multistep process that involves specialized machinery, words and images are carefully formatted and embedded into laser holograms, a medium whose visual dynamics allow for numerous static manifestations in a single work. Holopoems are organized without linearity in immaterial three-dimensional visual space, and they change—both in appearance and meaning—as the reader moves around the poem. Since holopoetry dynamically integrates the three dimensions of space with the added dimension of time, Kac believes that there is actually a fourth dimension to this work, which is activated mentally and physically. The purpose, he writes, is to "express the discontinuity of thought . . . fragments seen by the observer according to decisions he or she makes, depending on the observer's position relative to the poem" (186). Between 1983 and 1995 Kac created several holopoems, as did Kostelanetz.[1]

Using a "perceptual syntax" that explores "mobility, non-linearity, interactivity, fluidity, discontinuity, and dynamic behavior," holopoetry melts the rigidity of text in both traditional and previous forms of avant-garde work; words or letters cannot be seen simultaneously and become abstract color images floating in color fields that shift to the eye, growing, shrinking, or blending into each other (188–90). The inclination to use and manipulate language is there, but fixing it, or a specific meaning, is not. Implementing what Kac describes as a "mobile signifying system," texts only signify upon the active perceptual and cognitive engagement on the part of the

Fig. B.1. Eduardo Kac. Six points of view of the holopoem *Adhuc.* Multicolor computer holographic stereogram (WL transmission), 1991. Screenshot (June 3, 2004) taken from the author's WWW site, <http://www.ekac.org/allholopoems.html>.

reader or viewer, each of whom "writes" his or her own text as he or she views it (190). In Kac's 1991 holopoem *Adhuc* (fig. B.1), for instance, six words or short phrases in English, related to time, are layered as vibrant, distorted palimpsests that appear in different configurations and patterns.

Presented in English, six words or short phrases relating to time are presented. Each frame is a vibrant, distorted, sometimes dismembered palimpsest with different configurations and patterns, depending on the viewer's position before the piece. Kac writes of *Adhuc:* "The muddled interference patterns that blend with the words help to create an atmosphere of uncertainty, not only concerning the visibility of the words but also about the meanings they produce" (205). This motif is similar to the theories put forth by many hypertext theorists, yet the holographic arrangement is clearly different from what could be achieved by using typical tools of interactivity like the mouse or joystick. Positioning and repositioning the body undermines the otherwise fixed states of the text. Layers in holographic space "open" into each other—or activate holography's branching space—via the viewer's physical (bodily) movements. Kac's early holopoems involve anagrammatic mirroring, as in *Holo/Ohlo* (*Holo/Eye,* 1983), the presentation of a single word on the screen in different visual planes (*Abracadabra, Oco,* and *Zyx,* 1985), or abstract shapes (*Souvenir D'Andromeda,* 1990). In these works language is discontinuous; words or letters cannot be seen simultaneously and sometimes become abstract color images. This effect

is illustrated in this sequence from *Souvenir D'Andromeda* presented on the author's WWW site. Words are shattered into fragments, which are assembled and broken apart by the viewer's position before the text. In other works, clusters of words are shown that also morph into various words, shapes, or conglomerations when viewed from different angles that activate semantic shifts (*Chaos,* 1986; *Eccentric,* 1990). Kac also used cylindrical holography to generate the 1987 Möbius-like poem "Quando?" (When?), which can be read forward or backward. Later he began to present words floating in color fields that would shift, growing, shrinking, or blending into each other with minimal movement (*Albeit, Shema,* 1989; *Adrift, Zero,* and *Adhuc,* 1991). As he progressed, Kac's works became more visually complex and turbulent (*Astray in Deimos,* 1992; *Zephyr,* 1993) and engineered in multiple panels (*Havoc,* 1992). He learned how to use an unusual technology and effectively applied his knowledge and skills for purposes of poetic expression.

Kac deftly reflects visual poetry and poststructural theory in the graphical but textually unstable condition of the holopoems and in other digital poems he has produced using technological apparatuses that enable fluid signs to interconnect through an irregular syntax. In this work Kac creates reconfigured verbal units in which a sign alternates between appearing as a word and an abstract shape or variant scenes of letters and objects. Holopoetry aims to stretch the poetic imagination and to suggest meanings, ideas, and feelings that are difficult to convey by traditional means. Propagating light as a medium for interactive reading and writing creates animated language. Holography has allowed artists to manipulate each element of the seemingly floating layers of text with precision, which both Kac and Kostelanetz have used advantageously. Pieces are not projected but are "optical fusions," writes Kac, suspended in the space of a screen (196). This work is presented much in the way that art installations are; one must go to a gallery or museum to see them. The procedure of this type of writing relies as much on the precise placement of the objects as it does on the objects signified by the words (or other symbols). Generally speaking, a condition of ambiguity is found in Kac's work, which combines various processes, including animated poetry, "semantic interpolation," and "z-axis poetry" (205). As Rosenberg, Cayley, and other poets would become in the 1990s, Kac is interested in the intermediary space of a poem where, he writes, "the text is written with the malleable medium of light, where the word is free from surface constraints, where textuality is signifiers in motion" (211).

Kostelanetz's experiments with holography are not as extensive as Kac's or as his own work in other forms. His work in this area includes holopoem projects *Antitheses* (1985) and *Hidden Meanings* (1989), a collective title for several holograms including a 1987 collaboration with Kac (*Lilith*). He also produced, in collaboration with Hart Perry, an earlier series titled *On Holography* (1978), which was not a poem but a cylindrical piece (described on his WWW site as a "360 degree Integral White Light Hologram") that presented five individual layers of statements about holography atmospherically accompanied by a ninety-minute sound recording. In *Antitheses,* working with the holographer Fred Unterseher, Kostelanetz created a dense

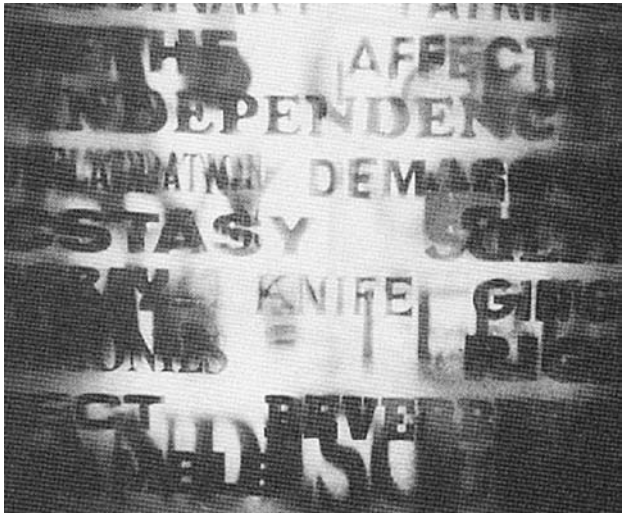

Fig. B.2. Richard Kostelanetz. Still (detail) from holographic poem *Antitheses* in *WORDWORKS* (Brockport, NY: BOA, 1994), 179.

visual layering of antithetical words that consisted of "two sets of words on four planes apiece" (Kostelanetz, *WORDWORKS* 174). He devised thirty-five pairs of "striking words in unfamiliar relationships," typesetting each pair in its own typeface in order to connect the words on visual and semantic levels (175). Including the base pair "Warm/Cold," thirty-six distinct layers are created in three optical ranges so that some—but not all—of the layers appear at once (in varying degrees of focus). *Antitheses* was unconventional as a type of "shadowgram" (fig. B.2), a process that required Kostelanetz to create a transmission hologram, or "make a hologram of a hologram" (175).

As seen in some of his videopoetry (e.g., *Kinetic Writings*), Kostelanetz overloads the screen with language so that only fragments emerge at once; formation of the words becomes sculptural. Viewers individually reassemble the words, the pieces of the poem, as they are received. As with some of Kac's work, the exchange between poet and audience involves a type of visual passage through language, components of which are often hidden; a linear progression through the material is not imposed by the author. Though the work exists in a highly defined and finite space, many unique approaches to the programmed (or formatted) constellations of language are possible. Again, as in all suspended transmission holograms, the viewers' experience with the text will depend on factors such as their height and how they are positioned in front of the piece. Kostelanetz considers this work the most successful of his visual poems, he writes, "because in three dimensions, with the spatial experience of language, I can better realize my earlier poetic idea of complemen-

tary words within a single visual frame, as well as my general aesthetic of reading in unfamiliar ways and doing with new media what could not be done in print" (*WORDWORKS* 177).[2] His later sequence of work, *Hidden Meanings,* mainly features single words (e.g., *Abracadabra, Holographer,* or *Madam*); viewers unveil phonemes two or three letters in length as they situate themselves in various positions in front of the holograms. The presentation of words in fragments in this piece recalls one of Kostelanetz's earliest videopoems, "Partitions," which also breaks the titular word into multiple subsegments.

Several other poets were also involved with holography. Frank Popper's *Art of the Electronic Age* introduces poems Dieter Jung created with holograms in the mid-1980s, with the same reasoning and result as Kac's, though not as prodigiously (41–42). At least two other projects that involved the projection of luminous words into an exhibition space transpired in the early 1990s, though neither was classified as poetry by the artists. As documented by Popper, Piero Fogliati and Bill Bell worked with virtual light images. Fogliati's *Chiosco delle apparizioni* projected letters onto slim rods in multiple dimensions that required viewers to visually deduce content via "back-and-forth eye movements"; Bell's "saccadoscopic" pieces achieved much the same effect using luminous diodes and computer technology (16). In Brazil, Moisés Baumstein began making holographic poems that were displayed in many international exhibitions, as did Fernando Catta-Preto.[3] In the mid-1980s Baumstein gathered a number of technological artists and poets in his studio (including Wagner Garcia, Julio Plaza, Décio Pignatari, and Augusto de Campos) to conceive and make new holograms, which were exhibited in São Paulo. As de Campos reports, Garcia was, in fact, "the first Brazilian artist involved with holographic poetry. In 1981, in London, with [the] help of holographer John Webster, he made the first work in the field with my poem 'REVER' (the last two letters in reverse)" (email 2005). In her essay "Litvideos (Video and Literature in the 80s and 90s)," Giselle Beiguelman mentions two 1985 exhibitions of holographic works displayed in São Paulo, "Arte e Tecnologia," organized by Arlindo Machado and Julio Plaza, and "Ide(h)ologia," organized by Plaza (9).

The most recent generations of poets belong to the media culture. As Kac observes in "Holopoetry," "They breathe television, video, videophones, computers, virtual reality, CDs, CD-ROMs, telepresence, holography and the Internet" (212). The challenge he presents to readers and poets alike is "to create dynamic electronic and phototonic texts that recover the conceptual power and the mysterious beauty of language" (212). No matter its level of potency, language and communication (via any media or computer encoding) will only engage individuals and contribute to various types of human transformation if they are accessible. By the end of Kac's plentiful descriptions of this extremely specialized work, it is not certain whether holopoetry—because of its inaccessibility to most writers—is the most effective form with which to achieve this goal. The spectacular qualities this invention possesses are unmistakable; the ideas and ingenuity in general demonstrate adventurous artistry. Proliferation of this approach to making poems—which are rife with

interactive qualities—has been limited, and, especially given other more readily available possibilities, it is unlikely that holopoetry will be pursued, unless the technology is simplified and becomes more widely distributed. Neither Kac nor Kostelanetz has returned to the form in the past decade.[4] At present, few poets have had the privilege to work with holography because it is somewhat costly to produce and requires precise installation; furthermore, writes Kostelanetz, it is "a very recalcitrant medium. . . . The problem in production is less expense than obstacles in assembling all the required production equipment" (email 2005).

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Some of chapter 2 appeared in an essay titled "A Vanguard Projected in Motion: Early Kinetic Poetry in Portuguese," published in the journal *Sirena: Poesia, arte y critica* 2 (2005). A version of the writing about John Cayley's work in chapter 3 appeared in the online journal *Entertext* (2006). Excerpts from the introduction will appear as an essay titled "Digital Poetry" in *The Blackwell Companion to Digital Literary Studies,* edited by Ray Siemens and Susan Schreibman. Variations of several sections of chapter 5 appeared in earlier publications, and I am grateful to the following editors and their publications for getting the work into print: Edward Foster (*Talisman* 16, 1996), Mark Wallace and Steven Marks (*Telling It Slant: Avant-Garde Poetics of the 1990s,* 2001), Scott Rettberg (*American Book Review* 24.3), and the Hermeneia Research Group (Barcelona), who circulated my report "E-Poetry 2003: An International Festival of Digital Poetry" (Online 2004). A 2004 MLA Convention session dedicated to Haroldo de Campos, organized by Christopher Dunn, gave me the opportunity to refine my views on the correspondence between concretism and computerized works in a paper titled "Interpoetic Intermediation: Brazilian Digital Poetry"; another essay that incorporates material presented, "Version: Layered Effects in Multiplex Poetry since Black Mountain," was delivered at a 1997 MLA session organized by Midori Y. McKeon. Other presentations of materials contained in this book occurred in Brazil at II Colóquio Internacional: A Crise da Poesia no Brasil, na França, na Europa e em Outras Latitudes, Universidade de Estadual de Feira de Santana; at IV Encontro de Iniciação Científica e VII Mostra de Pós-Graduação, Universidade Presbiteriana Mackenzie; at Festival Internacional de Linguagem Eletrônica III; and at Acta Media II Simpósio Internacional de Artemídia e Cultura Digital, Museu de Arte Contemporânea da Universidade de São Paulo (all 2003); in China at Reading for the New Millennium: A Global Dialogue on American Literature and Culture in a Time of Change (2001); in Malaysia at Multimedia University (2001); in the United Kingdom at Incubation: A trAce International Conference about Writing and the Internet (2000); and in the United States at the Wolff Institute, Brooklyn College (2001); at E-Poetry 2001: An International Digital Poetry Festival; at the NJIT New Media Series (2001); at the Associated Writing Programs Conference (1999); at Hypertext 98; at the National Poetry Foundation Conference (1996); at PROSPECTS: A Festival of Russian and American Poetry and Poets (1996); at the Video and Poetry Conference, University at Buffalo (1996); and at the American Culture Association of the South Conference (1994). My appreciation extends to the organizers of all of these events.

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Notes

Introduction

1. The original source of the quote is "Art ex Machina," Institute of Electrical and Electronics Engineers (IEEE) student journal (Sep. 1970): 11.

2. According to Glazier's *Digital Poetics,* in 1995 the number of hosts, or locations for the storage of files on the Internet, grew from 3.8 million to 9.5 million (44).

3. Bailey also cites Mallarmé's emphasis on, and promotion of, chance (see below in the essay) and the "imposition of order on disorder" as important tendencies present in the works he was able to collect. (Like many sources I will cite throughout this volume, Bailey's anthology is not paginated.)

4. Beyond digital poetry's obvious relationship to literary works and theories, I would be remiss to omit mention that early works were also influenced by trends and possibilities in mathematics (stochastic operations and other types of equations), computer science (hypertext theory), and other fields. Furthermore, digital poems share so much with other forms of multimedia art that it can be difficult to make distinctions between works that employ sound, imagery, language, and animation.

5. Glazier identifies some of the direct connections that can be discerned between digital poetry and the interdisciplinary Black Mountain School, visually based concrete poetry, the animated qualities of performance poetry, and other experimental forms such as Dadaism and Language poetry.

6. Though further discussion of technology appears below, a brief sketch of these languages, which use lines of coded information to direct different sorts of events to take place, might be useful. FORTRAN (short for FORmula TRANslator) and BASIC are (using Nelson's terms in *Computer Lib/Dream Machines*) "algebraic" (converted algebraic ideas and equations into programs) and were used for many purposes, "like custom business applications, statistics, and 'good guy' systems for

naïve users" (30, 16). According to Nelson TRAC language is an "interpretive," "extensible" (components could be added), "list-processing language" (20); it was more powerful for "non-numeric" tasks, with "good facilities for handling text," and was "excellent for stimulating complex on-off systems" (18). APL (an IBM product) was a "description language . . . a form of notation for stating how things work (laws of nature, algebraic systems, computers)" that was especially powerful for "mathematics, physics, statistics, [and] simulation" (25).

7. It requires immense effort to write computer programs that function effectively. Programming is a precision-oriented activity that demands copious amounts of patience and time. This fact is as true today as it was then, although software programs have substantially facilitated the process of creating visual works, hypertext, and multimedia works. To write code is by definition a meticulous occupation that requires special technical skills and understanding. A programmer interested in poetry cultivates the merging of these interests only if he or she is personally gratified by the work—nobody works as a poet for financial gain.

8. Several North American poets who did not practice visual poetry per se, such as Steve McCaffery, Olson, Paul Blackburn, and Susan Howe, also used typographical effects to alter a standard presentation of line in the postmodern era.

9. In *Radical Artifice: Writing Poetry in the Age of Media* (1991), Marjorie Perloff stresses that "the importance of Cage for postmodern poetics cannot be overestimated" because of his understanding that "poetry would have to position itself, not vis-à-vis the landscape or the city or this or that political event, but in relation to the media that, like it or not, occupy an increasingly large part of our verbal, visual, and acoustic space" (xiii).

10. "Ergodic" is a classification of text introduced by Norwegian scholar Espen J. Aarseth in the volume *Cybertext: Perspectives on Ergodic Literature* (1997). I discuss this concept more fully in chap. 5.

11. I would also like to acknowledge here, as a member of his examination committee, that the idea of digital poetry as a series of different types of *negotiation* is discussed extensively in a doctoral thesis by Jorge Luiz Antonio titled "Poesia Eletrônica: Negociaçoes com os processos digitais" (Electronic Poetry: Negotiations with Digital Processes), Pontifícia Universidade Católica de São Paulo, 2005.

12. This development enhances the prospects for digital poetry and widens the field, for as Nelson stated about writing code in *Computer Lib/Dream Machines:* "This type of thing is totally unsuited for literary types of people who care most about text and its characteristics (connotations, twists) which can *not* be found by definable structured search. And who should not be forced to deal with explicit computer languages because it tends to interfere with the thought processes they are supposed to be pursuing, if not make them physically ill" (15).

13. Perloff inserts a quote from Allen Ginsberg's essay "When the Mode of the Music Changes the Walls of the City Shake" regarding "conventional form" that might equally apply to works made by computer operations: "Trouble with conventional form (fixed line count & stanza form) is, it's too symmetrical, geometrical,

numbered and pre-fixed—unlike my own mind which has no beginning and end, nor fixed measure of thought" (134).

14. Robert Kendall, in a 1996 ht_lit listserv posting, adds a useful conceptual corollary to this definition when he writes, "I prefer to acknowledge that what we really mean by 'nonlinear writing' is NOT writing that contains no linearity but writing that mixes nonlinear elements and multiple linearities."

15. The term *netspeak,* writes Strehovec in "Text as Loop," implies that "the language of zeros and ones, and of ASCII and HTML characters is involved in new poetic structures with striking visual, animated, and tactile features."

16. The same processes were previously classified as "computer-assisted poetry or prose" by McCauley in *Computers and Creativity* (1974).

17. The three "negative" (and offhand, if not cynical) definitions provided by Stefans are (1) "the lack of limitation to black and white words in a page, (2) the lack of the possibility for mechanical reproduction (there being no original), (3) the lack of closure and the lack of choice" (46).

18. GUI technology brought the presentation of documents away from the use of DOS and command lines, which, as Peter Anders points out in *Envisioning Cyberspace: Designing 3D Electronic Spaces,* transforms "cognitive artifacts into perceivable, experiential ones" (53).

19. Englebart also pioneered the first computerized hypertext system in 1968.

20. All of the dates in the "Technological Conditions" sections of this book are taken from *Understanding Hypermedia: From Multimedia to Virtual Reality* (16–19), unless otherwise noted.

21. I would like to mention three other technological inventions that were developed during this period that have either already made, or could very well make, a significant impression on digital poetry. In 1972 the first video game was produced, launching an entertainment phenomenon that rivals the popularity of television. As time has passed, video games have only become more refined and more popular. Critics such as Espen Aarseth have already envisioned and discussed literary video games; it is presumed that if there is a future for cybertext, poetic (creative, informative, educational) video games will be developed (others would argue all hypertexts are games). The development of virtual-reality games (1990s) and data gloves (1988) may also lead to the creation of more physically immersive presentations of technological poetry. Beyond the cultivation of videopoetry and holopoetry (appendix B), the invention of digital cameras, cellular phones and PDAs, MIDI, DAT, and other technologies have already led, one way or another, to the presentation of poetry using new media techniques.

22. E-Poetry events were held at SUNY-Buffalo (2001), West Virginia University (2003, see chap. 5), and Birbeck College, London (2005), organized by Glazier and Sandy Baldwin (2003 only). These festivals successfully brought together many artists from numerous countries. Serving a similar purpose, poesıs events organized by Friedrich Block were held in Zusammenarbeit (1992, co-organized by André Vallias), Kassel (2000), and Berlin (2004).

23. Cybernetic Serendipity: The Computer and the Arts was an exhibition held in London in 1968, curated by Jasia Reichardt. This event signaled the fact that computerized literature (as well as other art forms) had become a serious, international practice.

24. I am thinking specifically of resources such as the *Electronic Poetry Center, UbuWeb,* and *Brazilian Digital Art and Poetry on the Web* (all of which are maintained by active digital poets: Glazier, Kenneth Goldsmith, and Antonio, respectively).

Chapter 1

1. Hardison's book refers to Warren F. Motte's *Oulipo: A Primer of Potential Literature,* which argues that these conditions of Oulipo's productions are in response to " 'the ponderous sobriety' of French structuralism" (200).

2. For more discussion on Oulipo, and writings prepared by the group, see Wardrip-Fruin and Montfort, *The New Media Reader,* 147–94.

3. The *Cybernetic Serendipity* catalog reports that the operations involved with the successful production of Balestrini's "Tape Mark" poems required the author to create 322 punched cards and 1,200 instructions into the computer (Balestrini, "Tape Mark I" 55).

4. See appendix A for a brief discussion of "Codeworks."

5. All of the works reviewed in my study can also be easily read through such a lens. Mac Low's *42 Merzgedichte* in Memoriam *Kurt Schwitters* is a "dice model" text; John Morris's haiku generator and many other titles employ the "sentence variation model"; TRAVESTY is an obvious example of the "filter model."

6. It is worth noting here that many different text generators, suiting a range of purposes, have been made available for download through several resources on the WWW, yet the descriptive structure used to index the programs is simple and without types. The site *TextWorx Toolshed*—which is unfortunately no longer available—harbored about thirty programs that generate or manipulate writing, but the site only had two categories: "Mac Programs" and "DOS Programs." Subcategories on most sites are not established, offering only brief captions about each program. *Computer Generated Writing,* a site that has been in operation since the dawn of the WWW, contains comparable materials and adds two categories, "World Wide Web" and "UNIX," to index types or platforms for programs that automatically compose language. See chap. 5n8 for an index of programs available from these WWW sites.

7. Three years later Bense published one of the first essays about composing "artificial" poems, "Über natürliche und künstliche Poesie" ("On Natural and Artificial Poetry"), published in *Theorie der Texte* (Text Theory), 1962.

8. The article was published in *Augenblick* 4 (1959) and has been republished on the WWW at <http://www.reinhard-doehl.de/poetscorner/lutz1.htm> (accessed July 7, 2003); see also <http://www.stuttgarter-schule.de/lutz_schule_en.htm> (accessed Oct. 3, 2006) for an alternative English translation of Lutz's essay.

9. The programming details are not available; alternate versions of the poem, in which the words appear with a different sort of arrangement, are included in Williams's *An Anthology of Concrete Poetry* (1967) and in Kostelanetz's *Text-Sound Texts* (1980).

10. During the same period Williams—known for many achievements, including the aforementioned anthology—produced two interesting computerized permutation texts also worthy of mention here. His first work, "Music" (1965), implemented an IBM 1070 to identify the 101 most common words from Dante's *Divine Comedy* and used them to create a series of computer poems. An intricate description is found in Jacques Donguy's essay "Poésie et ordinateur." Williams borrows a condensed verbal framework from Dante, which is mechanically represented into lines that diminish, in relation to the number of times they appear in *Divine Comedy,* until a single word remains. The ideogrammatic appearance that would take shape as a result of this design scheme (a downward pointing wedge) portrays more than a degree of concretist aesthetics, as represented in the shaping present in works such as Gerhard Rühm's "wan" (Wildman 102) and Williams's "do you remember?" (Williams 1967). Concrete poems also invert this type of shaping by placing one word in the first line and gradually layering words beneath it; also, concretists commonly atomized words themselves, so that instead of presenting a single word on a line, a single letter or a fragment of a word is presented. Donguy's essay also describes Williams's "The IBM Poem" (1966), in which twenty-six words are randomly chosen from a dictionary and each is associated in a list with a letter of the alphabet to form lines; the letters of words in one line are then used to make subsequent lines. Juxtaposing "The IBM Poem" with Gysin's permutation work, Donguy makes the distinction between text that results from a processing of itself (Gysin) and Williams's texts that feature a self-contained generative dimension. Williams's combinatoric work is, in other regards, similar to Gysin's—even though the database seems limited (twenty-six listed words in this case), a vast number of different poems result from a small amount of input text.

In the 1980s Hartman also experimented with numerology. His program Numerol assigned a chronological number value to each letter (e.g., a = 1, b = 2, c = 3, and so on) and identified groups of words according to their individual number value. Since the words emitted by the program are without syntactical association, the output words are formatted in multiple horizontal planes on the page (nongrid) as a way to sculpt them into a poem. In "Extraordinary Instruments," a poem shown in *Virtual Muse,* the language is entirely readable, even though it contains a type of abstraction and discursive vernacular found in many contemporary openform poems. Repetition is present though less pronounced than in other works. Where words echo, they impart a sense of urgency. The artistry in this work is twofold; in addition to the actual programming, the poet arranges words into a document that looks like a poem. In his second Numerol experiment, an online dictionary was used as the input text, and words with a "68" number value (e.g., *that's*) gave him approximately a thousand words to work with (99). The shaped texts are

readable, playful, and musical at points with repeated "That's," plural nouns, and gerunds:

> That's editing albums, drafts,
> absences. That's tardy bygone
> laminar years. That's waning
> heyday, eclogue harking. That's
> bother befalling, deathbeds daftly
> creaking. That's apogees. That's
> patchable fedoras. Bleakly, that's
> realms, Brazil, Taiwan, Persia,
> Prague, Denver, Topeka, Munich.
> Madagascar. Appalachia. That's ways.
> That's penciled pardon. That's
> shalom. That's liveable goodby. (147–48)

The work becomes more than a list of words connected plainly by their numerological contents; generated words and punctuation are placed and scored deftly by the author, collaborating with the machine to create an energetic poem.

11. This work (which first appeared as "autopoems" in a publication titled *Literatura cibernética,* 1977) is subtitled "trovas electrónicas" (electronic ballads), although seeing this work as a literal interpretation of that particular form is challenging.

12. Another of Barbosa's programs, "Aveiro" (1977), also addresses a town in Portugal and is presented and performs in much the same way as "Porto," though it adds the words *with* and *without* to diversify and vary the way statements are formed around the river *(ria)* and its water *(água).*

13. No specific information on which program was used is available; it may have been Autocoder, which was the program used most commonly on the IBM 7070, or FORTRAN or RPG (Report Program Generator), which also ran on that machine.

14. A slightly different formation of the poem, which does not reflect the description presented in *Cybernetic Serendipity,* appears in Barbosa's *A ciberliteratura.* Its source is the original *Bompiani Almanac* publication, which shows a four-line block formation that more closely resembles the samples of *Syntext* output shown in the next note.

15. There are significant discrepancies between Morgan's shapely translations of "Tape-Mark" and examples of output produced by the *Syntext* version of the program (2004). *Syntext* produces four Italian blocks of text each time the program is activated. There are no punctuation marks other than a final period, and words that happen to fall on the right-hand margin are split into two lines. As blocks of text, the poem requires the viewer to formulate interpretation or separation of text into distinct units; its output on the screen lacks formatting and is blurred, rather than sculpted, with poetic nuance. While the language is familiar, the lack of punc-

tuation and line breaks emits a strikingly different poetic arrangement in these recent translations by Carla Billetteri, akin to stream of consciousness in the form of a prose poem:

1
IT RAPIDLY EXPANDS I CONTEMPLATE THEIR RETURN THE SUMMIT OF THE CLOUD TAKES ON THE WELL KNOWN MUSHROOM SHAPE WHEN IT REACHES THE STRATOSPHERE THIRTY TIMES BRIGHTER THAN THE SUN THEY ALL RETURN TO THEIR ROOTS WITHOUT SPEAKING TRYING TO CATCH THEIR HAIR BETWEEN THEIR LIPS WHILE THE MULTITUDE OF THINGS TAKES PLACE THE BLINDING GLOBE OF FIRE UNTIL SHE SLOWLY MOVED HER FINGERS THE HEAD PRESSED ON THE SHOULDER.
2
THE HEAD PRESSED ON THE SHOULDER I CONTEMPLATE THEIR RETURN THE HAIR BETWEEN THE LIPS WHEN IT REACHED THE STRATOSPHERE UNTIL SLOWLY MOVED FINGERS THIRTY TIMES BRIGHTER THAN THE SUN WHILE THE MULTITUDE OF THINGS TAKES PLACE THEY LIED STILL WITHOUT SPEAKING THE BLINDING GLOBE OF FIRE TRYING TO CATCH THE SUMMIT OF THE CLOUD IT RAPIDLY EXPANDS TAKES ON THE WELL KNOWN MUSHROOM SHAPE THEY ALL RETURN TO THEIR ROOTS.

16. Renga is a style of Japanese linked poetry in which stanzas are semantically related and create a type of code. Words or phrases are repeated in successive stanzas. A program written by Jean-Pierre Balpe for Les Immatériaux exhibition in Paris circa 1985 also emulates this written form.

17. The article notes the Librascope Division of General Precision, Inc., in Glendale, California, as the site of the computer. Hartman lists R. M. Worthy as author of the program and reports that examples of Auto-Beatnik poems were published in a magazine called *Horizons* in 1962 (*Virtual Muse* 2). Only one "Auto-Beatnik" poem can be found on the WWW at present, "Poem No. 41: Insects"; see <http://hem.fyristorg.com/stettin/hemsida/poem.html> (accessed Aug. 8, 2004).

18. Mac Low also used PFR-3 to compose poetic "stories" titled "South," which are referred to and shown in McCauley's *Computers and Creativity.* The distinction of these works as "stories" is casual, referring to their narrative value; it is not a meaningful formal distinction.

19. Mac Low conducted numerous computer-aided compositions during this period, in which turns of phrase and sometimes the raising of questions—which have the effect of presenting a sudden thought—alter the narrative and transform the reader's perspective. One such poem, "South," is grouped with the PFR-3 poems in Mac Low's *Representative Works.*

20. In addition to being a prolific writer and producing digital works such as

those introduced here, Sondheim experimented with video and as a musician released two records with a jazz group on the renowned ESP label.

21. Another essay by Sondheim, "Grounds for a Procedural Semiotics: Calculator Programming and an Outline of an Analysis of Marxism in Relation to *The Structure of Reality,*" analyzes the work from programmatic and ideological perspectives (as "a preliminary structuration of Marxist dialectic" [1]). This essay offers more information about the program's structures and specifications, including the fact that the calculator "accepts up to 960 programming steps, is card programmable, and possesses algebraic logic" (2).

22. Like Balestrini's "Tape-Mark," Carmona's piece is built into this program. *Syntext* is a "generator of texts" produced during 1993 and 1994 by Pedro Barbosa and Abílio Cavalheiro that gathers (or re-presents) fifteen programs designed to generate texts with both randomized and calculated variables. Initially, this conglomeration of programs circulated in the French hypermedia journal *Alire* 8 (1994), and was later circulated with the authors' book *Teoria do homem sentado* (1996). Every program in *Syntext* engages with DOS language on the user's computer, and appears in ASCII (i.e., plain) text; with the exception of Bénabou's work (which is in French) and Carmona's (Spanish), all of the output is in Portuguese. By compiling and making available in multiple publications the various programs that are contained in *Syntext,* Barbosa and Cavalheiro make a valuable contribution to the community of digital poetry in that these works are preserved in formats that are accessible and will likely be accessible for the duration of the PC/Windows era; a version of the program is also now available on the WWW (see <http://cetic.ufp.pt/sintext.htm> [accessed Jan. 16, 2006]). Their work as anthologists was a great service, saving researchers the tremendous effort it would have taken to ferret out and view each of these works individually.

23. A second ten-line sample created by the program embodies similar themes of darkness, loss, and sound/soundlessness. This example also sustains itself by mixing questions, assertions, and ponderous statements; poetic invention and foible (as above) is also present: the phrase "desde ahora" (from now) is used to vitalize the expression and force of the poem, putting the construction of the idea into the present moment. The fact that the phrase did not appear again in numerous other poems generated by the program speaks to the program's flexibility, an attribute that will keep viewers engaged. One can find similar rhetorical techniques between the two examples, though the syntactical construction is not at all repetitive. Viewers are led into the poem in much the same way, with speculation and a natural setting: "How many wish the dark silences in my dead madness . . . / Secret night you do not open the moon . . ." As before, sentences vary in length and sophistication and usually contain active imagery that revolves around the established themes, as in the line "Dark and misplaced will sound your kisses kissing the thoughts apotheosis of all the blows because it would have sounded the minute of not fearing." In subsequent activations of the piece, poetic techniques such as isolated repetition of line structure are used to propel the work ("Secret night you do not kiss the laughter . . . /

Secret laughter you do not open the night . . .") (May 21, 2004). The composition captures a troubled voice, one of a lonely person who imaginatively embraces the span of his or her existence and the end of life. The articulations of the program, written by a person but projected by a computer, will not be taken as seriously as the madness in the lines of Edgar Allan Poe or other poets who included such dramatic features, but the viewer may also find humor and irony in the unique cyborgian texts.

24. Robin Shirley's "Cosmic Poems" were originally composed using the text-composition program BARD at the University of Surrey (UK). Claiming to have "progressive degrees of freedom, with various examples in each and all," the poem consists of three successive fragmented iterations of Shirley's poem "Pavan (song) to children of infinite space." Every poem created by the program, regardless of its level of fragmentation, contains each of the lines of the original poem, shuffled into a new order; the further the scrambled text is removed from its original context, the more liberated it becomes. Because of the way the poem was originally written (presumably not fragmented but containing many abstractions), the reordered lines, although unconventional, are readable and recreate the galactic intentions of the poem.

25. In most cases the input was trivial, such as in C. Orlock's "Dated Poems" and Michael Karl (Ritchie)'s "31-IT," which appeared on Marco Fraticelli's *The Alchemist* (1984). In Orlock's interactive work the viewer is prompted to input specific data into the poem (e.g., his or her birthday and "today's date"). With this information the program makes a slotted rhyming poem. Karl Ritchie's "31-IT" (appearing as a rudimentary slot machine), in which sixty-four quadrillion word combinations are possible, allows the viewer to establish the speed at which he or she reads the work.

26. *Computer Poems* (1973) is an anthology of works by poets involved with computers; as with *Cybernetic Serendipity,* the impetus for this publication was a symposium about the computer's role in the arts. In "The Meditation of IBM 7094-7040 DCS," Borroff uses random-number generation on a series of vocabularies selected from classical English poetry and nondigital works by her contemporaries. The program, according to McCauley's *Computers and Creativity,* "involved nineteen different vocabularies of fifty words each, which the machine combined and interchanged, using random-number generation, into two stanzas a second or a theoretical 7,200 stanzas an hour" (117). Four basic (yet varying) stanza types are shown to present open verse:

O poet,
Dream like an enormous flood;
Let the work of your bed
Be stilled;

The night
Comes and shines.

The earthworms are multiplying;
The river
Winks
And I am ravished.

Oh poet,
The body of your blessing reaches me. (117)

In "Once upon a Computer . . ." McCauley is critical of works that emulate written verse and asserts that authors who do so are using computers "uncreatively" (109). She cites Borroff's poems, which aspire to emulate a style of traditional poetry by incorporating traditional language. These poems are not any more compelling than mediocre stanzas written by a human, and the fact that they were generated by a computer program is not particularly remarkable. As Hartman has observed, "The trap for poetry is that the more accurately it mimics human language, the more ordinary it becomes" (*Virtual Muse* 94). Programmed poems that try to meet conventional standards are not a dominant presence, but those that do are awkward. Reifying traditional styles is questioned as a viable pursuit in this type of poetry, in spite of the effort involved with such productions. Applying the computer to create normalized literary works proves itself to be neither appealing nor potent (a condition also demonstrated by Milic's work in the same anthology). Writing of her work in "Producing Computer Poetry," Chisman claims, "The contribution of the computer (or a 'computer approach') is to suspend judgment on conventional patterns of association" (106). Her methods to keep works from being "bathotic" and redundant include the omission of rhyme and punctuation ("because its absence allows greater varieties of combination of meaningful groups of words"), limiting the vocabulary in each list to ten words or fewer, as well as including random words "out of keeping" both with her typical vocabulary and with any thematic content and, in later works, writing the program so that words, once used, will not repeat.

27. According to the author's note, the program used to create *Energy Crisis Poems* was capable of creating "from 34,816 bytes of input a poem or up to 32 poems at a time, in almost any structure describable" (9). *Energy Crisis Poems* contains four poems of the same thirteen-line form: four three-line stanzas followed by a single line at the end (each on a single page); a series of hand-drawn images—abstractly relating to themes in the text—are placed on the pages in between the poems; the collection has a homespun aesthetic quality that indicates it was produced with a mimeograph machine (a popular publication method for small presses at the time). With its common typewritten font and carbon duplication, the poem's distribution is incongruous with its digital origination and falls more in line with the style and aesthetics of "analog" publications of the era. While not specifically referencing a particular Beat writer or poem, the poems are also akin to Beat-era work: primal, loose, invoking organic and sexual language with the lively, dystopic, sensitive, and

wild expressions characteristic of that group. As computer poetry the work significantly lacks repetition in its words, syntax, or verbal patterning (at least in this publication).

28. Hartman's first digital poems were created in the 1980s on a Sinclair Zx81 with a "poetry composer" he wrote named RanLines, which used BASIC programming language (*Virtual Muse* 28–29). The program stores twenty short lines and, when activated, randomly chooses one for display on the screen. This process is repeated until the user determines the poem is finished. The implication, writes Hartman, "was strictly a reader's ingenious doing. . . . Only the act of a person, deciding to stop the program establishes a defining boundary for the poem" (31–32). This particular work is reminiscent of Mac Low's PFR-3 poems in that single lines that remain intact constitute the database; it uses a range of natural images to unique effect and portrays repetition, one of the primary traits of the computer poem of the early era. The permutation is not in the words of a line but from poem to poem, each of which is unique. Syntax of the lines varies greatly; words are not repeatedly inserted into the same location. The trick in creating a successful poem is to conceive every line so that it will correspond fluidly with all other lines in the program's memory or database.

29. According to A. K. Dewdney's article "Computer Recreations," Thomas A. Easton's "Thunder Thought" relies on "internal lists of nouns, verbs, adjectives and adverbs" that the program rearranges into sentence structures (Dewdney 122). The purpose of the generated text is not to produce a final product but to provide "raw material for a human mind to refine" with editing and his or her own interpolation (ibid.). The intermediate output of the program is meant to stimulate and provoke the viewer to amend what has been generated. The object is to present a scenario of text that invites the combination of irrational expression with rational thought and critical refinement, a more involved collaboration between program—which is capable of producing surprising juxtapositions of language—and viewer, who nurtures and filters the text once it has been produced. This work does not propose a game but a tool to instigate poetry. The advantage of such an approach, though it makes new demands on the reader, is that any subject matter can be introduced into the work in the process of its cultivation. "Thunder Thought" is meant to spring the user into a creative mode. Of course, the same could be said about every text-generating program, even those that produce "completed" poems, because nothing prevents the viewer from using any program as a heuristic lever for the activation of works.

30. Rosemary West's "Poetry Generator," also discussed by Dewdney, replicates the style of composition used by Margaret Chisman. West creates a series of verbal structures, breaks them down into parts, and then makes lists of words or phrases that adequately fill each position in the texts. The program automatically (randomly) assembles new texts using the structure of the original. Unlike Chisman, West does not limit her databases to a few words but implements "between 100 and 400 substitutions for each part" (Dewdney 122). Because her phrases vary consider-

ably, the effect of the large, unsettled database lends "variety to the syntax and to what seems to be the meaning of the poem" (ibid.).

31. By 1995 he had completed twelve titles in the series, most of which use text generation, though not always in the same manner. The titles of Balpe's early works are "Autobiographie," "Epigrammes," "Hommage à Jean Tardieu," "L'amour dans l'âme," "L'esprit humain," "Le masque," "Les tentations de Tantale," "Proverbes," "Questions d'amour et de poésie," "Réponse à Claude Adelen," and "Un roman inachevé" (email). Balpe added eleven new pieces to the series between 1995 and 2004.

32. Balpe's narrative included excerpts from poems by Vaclav Havel and Louis Aragon, Gertrude Stein's *How to Write,* and Paul Eluard's "Berceuse."

33. Masterman was a member of the Cambridge Language Research Unit. She was not a poet but a scholar who wrote profoundly on the growth of scientific knowledge (including the widely cited essay "The Nature of a Paradigm") and who became extremely interested in machine translation.

34. His essay "How to Write Poems with a Computer" (1967) outlines the problems of reinscribing known poetic structure by way of recalling his experience as an author of computer-generated haiku. The program borrowed forms and vocabulary from a collection of Japanese haiku and could generate two randomized haiku per second. The results of his experiment were, however, unsatisfying, and the essay includes only two generated works that the author valued. Most of the essay conceives a series of programmatic steps that would enable better results. Morris separates the internal dynamics of computer poetry into two distinct areas: the algorithmic (step-by-step procedure or instruction) and the random. The algorithm has three purposes: choosing, testing, and correctly ordering the words. Because of the loose and abrupt syntax embodied in the form, establishing the sequence of haiku presents a particular challenge. The program needs both algorithm and "anti-algorithm"—the latter feature is essentially a bypass mechanism that allows the introduction of surprise and discordant ideas (18). However, the semantic aspect of the algorithm, writes Morris, would be "about the size of an encyclopedia" and must be able to give the poem "texture" (19).

35. Tim Hartnell's "Haikai" (1984), included in *Syntext,* rapidly produces eight haikulike poems per activation. The output was not designed to strictly emulate the traditional five-syllable, seven-syllable, five-syllable format but rather emits a range of three-line configurations that draw from a database of words and phrases large enough to minimize repetitions in language or syntax during a single activation:

dangling . . . transparent
. . . asleep
the cause to waste

inclined with elegance
remove the torch
gloomy, gloomy. (July 13, 2004)

36. Stone's *Haiku Master* (1988, modified by Brian Thomas in 1989 for the collection *If Monks Had Macs*) employs a GUI that allows the user to create a haikulike poem by clicking a button. Users can set or edit vocabulary in the database and save the generated poems in a separate file. The "*Haiku Master* Vocabulary" includes ten different categories: introductory words, two sections of adjectives, two sections of nouns, verb, and four sections of endings (one each for one-, two-, three-, and four-syllable words). Here are some examples of poems written by *Haiku Master:*

flaming weaving robot
nested midnight street
drive-thru destiny
. . . . . .
sometimes manifold rose
disturbs hirsute city
slender apologetics
. . . . . .
unreal journey evening
shimmers dreadful idea
evolution
. . . . . .
some desire wine
shines windless green
unknown uncertain dangling (April 22, 2004)

The program selects a random word from each of six categories (introductory word + adjective + noun + verb + adjective + noun), counts the syllables, and then selects a word of appropriate size from the remaining four categories to complete the poem as a seventeen-syllable work. Breaking rules in supplying words for the database, however, disrupts the uniformity suggested by both the traditional form and program. In a mode similar to Morris and Gaskins, *Haiku Master* produces a variety of "haiku" because of its sophisticated vocabulary and programmatic systems, and it approximates three-line, five-seven-five haiku. In each of the above examples, the third lines in each poem differ dramatically in terms of syllabic and grammatical content. The format of the output, within the boundaries of its database and established structure, can never be predicted. As the user in many ways controls the content of this work, the output is a result of that person's skill with language and craftiness with concept. Thematically related vocabularies can be developed and employed to produce a series of coherent works. On the other hand, completely random methods can also be used to establish vocabularies as well, which may be more appropriate to the form. As seen in many computer poems, *Haiku Master* poems, when generated consecutively, quickly begin to show repetitive features. If, however, a word begins to appear too often, or proves to be mundane or ineffective, it can be easily removed from or replaced in the database. The user has the ability, and perhaps the responsibility, to include the most compelling language to suit her or his

purposes. To rely on the language included in the original dictionaries will limit the capability of the program, whereas actively cultivating the dictionaries enables the user to avoid redundancy in composition.

37. The poem first appeared in *Cybernetic Serendipity* as "The House," then in Dick Higgins's *Computers for the Arts* (1970) under the title "Proposition No. 2 for Emmett Williams," and later in *Fantastic Architecture* as "A House of Dust, Computer Poem." *Computers for the Arts* is a short and technical memoir in which Higgins introduces two works ("Hank and Mary" and "Proposition No. 2") to discuss the "artificial language" FORTRAN as a vehicle for poetry. *Fantastic Architecture* (an anthology edited by Higgins and Wolf Vostell, 1971) stems from Fluxus; the book focuses mainly on visual arts or architecture and contains commentary on art and society by Joseph Beuys, Raoul Hausmann, Franz Mon, Carolee Schneeman, and others.

38. Twelve stanzas are shown in *Cybernetic Serendipity;* thirty-three are published in *Fantastic Architecture* and thirty-six in *Computers for the Arts.*

39. APL ("A Programming Language"), used to produce several works discussed in my study, was developed in the 1960s and refined over two decades. APL, as explained in an essay "Why APL?," posted on the Association for Computing Machinery Web site, was commonly used to direct a computer to process numeric or alphabetic data "designed to overcome the inherent ambiguities and points of confusion found when dealing with standard mathematical notation." APL was capable of the following: adding, subtracting, multiplying, dividing, calculating logarithms and exponentials, converting number bases, performing trigonometric functions, generating random numbers, rearranging arrays of numbers into different size and shape arrays, i.e., vectors, matrices, and multidimensional 'cubes,' and many other mathematical tasks.

40. Barbosa's program Aforismos-1 is quite similar to Bénabou's program, as the poems result from the recombination of five structured phrases. When activated, the program produces a litany of twenty-five aphorisms—two-part sentences pairing questions with randomized answers. The statements are structured around the following four phrases: "I make _____ questions, you give _____ questions; she/he makes _____ questions, he/she ruminates _____ responses; for _____ questions, respond _____; who makes _____ questions, receives _____ answers," as in the following examples:

> I make direct questions, you give upright questions.
> Who makes loaded questions, receives forgetful answers.
> For convex questions, obscene responses.
> She makes ceasing questions, he ruminates responses on water.
> (July 14, 2004).

As in Bénabou's work, Aforismos-1 randomizes language that fills the slots and the order of the lines; the database for the work contains, for the most part, simple adjectives used to complete the sentences. The aphorisms are readable, and the hap-

penstance merging of elements creates unusual and paradoxical juxtapositions. This work demands that the author-programmer select words for the database that effectively fuse with others and cohere with each aspect of the verbal equation. To this end, Barbosa and Bénabou efficiently explore the mechanics of language.

41. In extreme contrast to Balpe's idea of "chaotic" literature, Barbosa introduces a highly organized, conventional initiative in *A ciberliteratura* that is not widely known (but is still available on the WWW as of 2005), called Your Personal Poet. The program was initially published by the Computer Poet Corporation in 1988 and marketed by Door Openers, Inc., for $9.95; a version that runs in DOS is available without cost on the WWW via <http://www.riverbbs.net/files/output/40106.html> (accessed April 27, 2004). This program, collaboratively built by a small group of researchers, enables the production of simple and trite occasional poems that emulate a generic, if personalized, holiday greeting card rather than a text suitable for an anthology of quality poetry. The user establishes a number of topical variables (e.g., who is to be addressed in the poem, including his or her name and descriptive traits), as well as stylistic variables (e.g., "light and amusing"/"serious and sentimental"). Your Personal Poet offers dozens of occasions for which it can write poems, including holidays and special events, as well as romantic-verse intonations (e.g., "I love you," "I miss you," "What a night!—Risque," etc.). The computer processes the information to a template, generating an otherwise prepackaged poem. The "serious and sentimental" poems shown by Barbosa are akin to the "light and amusing" poem that I configured (that contains a stanza in Spanish, as the occasion I selected was "Te Amo"), which amply illustrates the program's typical styles:

To Constellation
I'd like to say more than hello
These words about you seemed to flow
You're most independent
In this you're resplendent
And Constellation, I want you to know
A playfulness dwells in your eyes
Just ready to pounce and surprise
You charm everyone
By making life fun
I call that delightfully wise
Tu rostro resplandeciente
Y tu boquita sonriente
Me enternecen
Me orgullecen
Me emocionan sutilmente

A "poem menu" enables the user to print and edit the poems, as well as swap a poem with a previous poem, compose a new poem with the same data, or edit the verse operations.

The generic, calculated output of a program like Your Personal Poet situates it as a curious and unique production. Its simplicity, lack of variation within themes, and overall purpose raise notable artistic issues. If someone were compelled to present an acquaintance with a poem in order to communicate or impress a message, why would he or she choose to have a computer compose this special message? Presumably, the program is used strictly out of convenience, as a result of laziness or lack of imagination. Nearly anyone could match the level of linguistic and poetic prowess generated by Your Personal Poet. Better writings could be produced, though less swiftly, by appropriating higher-quality models of poetry as templates. In response to the program's solely computational attributes, Barbosa shows several variations of poems in which he uses intentionally subversive input. Rather than providing the specific name of a person (who lives in a specific place), Barbosa, in *A ciberliteratura,* enters "READER" and "ANYWHERE," giving the poems a mock Whitmanesque flavor; he also addresses poems to "Poet" and "Computer," which are mildly amusing (e.g., "I dedicate this moment to you, Computer / To the special, unique person you are") (230). Barbosa's attempts to find use for the program show some humor, but otherwise no progressive qualities emerge from Your Personal Poet, which (unsurprisingly) never surpassed the status of novelty item. In comparison with various innovations with computers and poetry occurring elsewhere, the purposes of this program are distinctly plain; the poems it generates lack variation and unusual juxtapositions of language.

42. Balpe's first computer work, "Poèmes d'amour" (1980), was a very simple "love" poem generator that created aleatoric poems that begin "I love you like" and end with a different phrase.

43. For instance, the *Poesia Experimentale* group in Portugal, led by E. M. de Melo e Castro and Ana Hatherly, began to produce works using numerical data and formulations, as did Richard Kostelanetz in his "Numerical Poems" (see Kostelanetz, *WORDWORKS*).

44. The *Byte* article describes refinements made during TRAVESTY's development and elaborates on what the program divulges about language. Essentially, the author-programmers argue that the frequency with which combinations of letters appear can be used to generate plausible randomized texts ("pseudo-texts") when the computer program mimics those frequencies (Kenner and O'Rourke 129). The relationship between these two texts, the article deduces, is that "*for an order-n scan, every n-character sequence in the output occurs somewhere in the input, and at about the same frequency*" (449). The authors demonstrate that "essentially random nonsense can preserve many 'personal' characteristics of a source text" (449). When *n*—or the numbers of letters in the text sample or "pattern length"—is large, the commonalities are glaringly mirrored; when *n* is small, the roots of the words are less defined and traceable, making the texts and words more distorted (464). With a small number of letters in the sample, the permuted output becomes more divergent from norms, as many words can (and do) share a pair of letters. Kenner's observation is logical: words that share the same letter combinations often share the same

etymological roots. Parallel texts created by TRAVESTY with a greater number of input letters largely embody characteristics of the input text (as many patterns will be unique).

45. Readers interested in TRAVESTY should see Hartman's book, which more fully considers and describes the methods of the program. It should also be noted that a program that emulates the mechanical process of TRAVESTY, titled "Tra{v, i, c, d, m} Travesty Generator" has been created (authorship unattributed) and uploaded to the WWW on a site built by Ron Starr, available at <http://www.eskimo.com/~rstarr/poormfa/travesty.html> (accessed August 10, 2004).

46. Acrostic poetry is a form in which the first letter of each line contributes to a word or phrase spelled vertically down the left-hand margin of the page.

47. Louie Crew also explored the possibilities for using computer programs that would automate or help poets write, and he developed programs called "Poetease" (1988) to "help with Assonance, Consonance, and Rhyme," and "Invent," which helped "writers invent metaphors" <http://rci.rutgers.edu/~lcrew/pubs.html> (accessed March 8, 2005).

48. In this project Hartman wrote short poems in his own verse forms to represent the "soul" parts of the piece. These poems were written into a single computer file, which was cycled through TRAVESTY several times. The output text became the "body" of the work, made up of words and fragments from the soul. The published output, shown in *Virtual Muse,* is a combination of original poems interspersed with selected TRAVESTY outputs (one for each *n* variable 2–9; Hartman chose TRAVESTY output that "*sounded*" best), a type of hybridized analog/digital work (63). Because the source writings ("soul") are shown along with the computer-generated selections, the reader can begin to see how the program makes use of the original text and how the two distinct types of work share associations. As the poem progresses, and the "body" text is less abstract, the author succeeds in creating parallel monologues in which one ("body") borrows from the other. By the end, the texts correspond with one another, even though the final sections share little in terms of common language. The selected "N = 8" and "N = 9" sections at the end of the poem incorporate language structures from throughout the poem (and its informative epigraphs), creating a choral effect that fuses the original content into an expanded rumination on the combination of subjects (e.g., chess, computers, war, Alan Turing). In his analysis of this work Hartman points out that the idea of using another author's writing as a basis for a poem is not original; what he has managed to show instead, through the unique process of the poem, is "thought devolving into mechanism" (i.e., the program taking the linear poem and scrambling it into incomprehensibility) and "a machine struggling towards what looks like thought" (as the language in the later "N" sections become readable and familiar, having been introduced to the reader earlier in the poem) (65). The piece shifts between its two voices throughout, though the verbal aesthetics are not as simple as that because the original poems vary in style. Rather than contain direct messages, the work alternates between meaning and nonsense; it is a type of puzzle that, Hart-

man writes, "mixes facts and other sorts of fictions and expresses distrust about the relation between games like chess and realities like war" (66).

49. The program Prose (the topic of chap. 7 of *Virtual Muse*) employs three computer languages (Prolog, Pascal, and C) to devise a highly developed "syntactical template" that randomly selects words with the appropriate parts of speech and arranges them into coherent sentences (73). Because structuring grammar poses distinct challenges, dozens of rules are written into the program. Containing thousands of templates, Prose does not enable the user to make additions (or subtractions) to the dictionary that is used to create output for the reader, though the grammar file can be edited if the user wishes to make different kinds of sentences than the program is making. The program's dictionary was edited so as to be devoid of bureaucratic language and is replete with words that have "positive effect on a reader's sense of coherence or purpose in the sentences" (81). Hartman came to view the program as "a first-draft writer"; his process in producing public (published) output involved generating copious amounts of text, reading through the materials, selecting the best poetic expressions, and editing for clarity (83). "The point of my work wasn't the power or originality of the program itself," writes Hartman. "The point, rather, was seeing how to use what it could do" (85). He collaborated with the computer rather than employing it to do his work as a poet. Over the years Hartman continued to cultivate the program, adding more features so the generated texts would be more compelling and writing code that could associate words and concepts that are topically related. Prose was later developed into a Macintosh computer program, MacProse, available for download at Hartman's Web site <http://cherry.conncoll.edu/cohar/programs.htm> (accessed Sep. 20, 2006). In reflection, he writes, "Part of the point of Prose turned out to be how compelling sheer (mere?) syntax is. If it smells like a sentence to our native-born syntactical noses, we can hardly keep ourselves from responding to it sententially, as if it were sententious. So the output of Prose, even in its raw state, is automatically more evocative than that of, say, Numerol or even DIASTEXT could ever be—though it remains just as dim-witted about real language as they are" (email).

50. Using a combination of the TRAVESTY and DIASTEXT programs, Kenner and Hartman assembled a book of poems called *Sentences* (1995). The source text, according to *Virtual Muse,* is a nineteenth-century grammar book, which was run through TRAVESTY "a number of times" and then underwent DIASTEXT's "spelling through" process (96). Fifteen poems are included in the book, each titled by "obeying what decorum seemed most apt" (82). Each piece begins with a 250-word text generated by TRAVESTY ($n = 7$), followed by DIASTEXT's manipulation of that text into poetry. The authors only intervene (i.e., manually edit the text) when TRAVESTY generates nonwords or cuts a word in half at the end. Repetition and unlikely (if not nonsensical) word combinations are the poems' most notable qualities.

51. This process is more thoroughly described in a discussion of the MARK V. SHANEY program, created by Bruce Ellis, in A. K. Dewdney's article "Computer Recreations."

52. In addition to using software (and other design skills) inventively for many printed publications, always approaching their work from a specific yet nonrigid avant-garde slant, the group's "Hyper Zaum project" transpired in a series of HyperCard productions until the arrival of the WWW. Of this work, producer aND writes in PataLiterator, "The main focus remains the same as the Russian Futurist Zaum Movement. The idea of neologistic creations in all media and the preempting of all existing culture codes, the future must be continually invented by a pool of thoroughly trained imaginators." The 1990–92 edition of the Xexoxial Endarchy catalog provides a partial list and description of software produced by this group, all of which were originally published on 3.5-inch floppy disks: *Zaum Gadget* (1986) by Amendant Hardiker ("crossmedia psychotronic beliefware . . . A maze of twisted sound effects, extant texts, & interactive visual effects") and *CHAOS GIZMO* by Amendant Hardiker & Pechulia Glim ("an abstract simulation of chaos theory and information management thru hypertext linkage & computer intermedia"); another Xexoxial title published on diskette that draws from futurism (as well as Dada, constructivism, and surrealism), *Noise House* (1992), by the Wisconsin Conservatory of Noise, is a "surgically manipulated," hypermedia hip-hop single that cuts John Cage with Public Enemy while typography and other animations tumble around the page." Xexoxial's title PataLiterator is available as downloads at the *Computer Generated Writing* WWW site (see note 54 below).

53. This book discusses version 3.1, dated 1992; date of version 1.0 is unknown.

54. The program, which remains available for download via the *Computer Generated Writing* WWW site <http://www.evolutionzone.com/kulturezone/c-g.writing/index_body.html>, comes with a minimal, generic dictionary to which the user can add or remove nouns, verbs, adjectives, and determiners.

55. I have employed the program in several different ways onstage. Using the program's visual poems as a foundation, I have improvised my own sound poems, determined by the patterns and other elements presented by the program; I have also used the "pictures" poems as a backdrop and point of spontaneous reference during performance. Or, in another instance, when the materials on the screen were not being projected to the audience, I generated countless poems to select and read from, accompanied by the computer's random amplified sounds and live music and/or video. The program is not a tool that I use frequently, but it is one I have used effectively on several occasions, including a performance with Thelemonade at SIGGRAPH in 1993. The program requires patience and preparation. As with any poetry generator, it can potentially produce a large amount of unsatisfying work, which should be omitted (unless the presenter's objective is to irritate an audience).

56. *Oulipo Compendium* notes that groups analogous to A.L.A.M.O. were founded in the United States (Marvin Green, Gerald Honigsblum, Rob Wittig) and Italy (Marco Maiocchi), though no details of their works are made available. Donguy's essay "Poésie et ordinateur" claims that the group was founded in 1992.

57. Details about litware works are largely absent from the authoritative *Oulipo Compendium.* Few were ever fully completed and thus are not features of *La bibliothèque oulipienne.* A section of one edition of the Oulipo publication *Atlas* con-

tains articles about the group's use of computers, including Braffort's essay "La literature récurrente" (Matthews and Brotchie 116). A program written by Braffort and Eric Jonquel creates a branching system that was modeled after Queneau's *Tales of Your Choice,* which serves to incorporate "an interchange between reader and computer in regard to the alternative readings of the work and a printout of the final result of the reader's choices" (Matthews and Brotchie 130). For many years Braffort worked with the novelist Italo Calvino to write a program that composed a narrative based on a prescribed situation in which the computer became an instrument of "anti-combinatorial reduction" instead of "combinatorial accumulation" (Matthews and Brotchie 131). These texts are mostly outside the domain of poetry but show that calculated works were seriously addressing the challenges posed by computer composition and that advanced works involving programmatic literature were being pursued. Bootz's article "Poetic Machinations," which chronicles a history of technologically based poetry in France, reports that within A.L.A.M.O., Jean-Pierre Balpe developed "poem generators" (121). Donguy's essay "Poésie et ordinateur" describes the group's involvement with the 1985 Les Immatériaux exhibition, where litware was installed and for which Balpe created a program that produced 32,500 rengas and a program that created haiku. The article "Informatique et poésie" ("Informatic and Poetry"), by Alain Vuillemin, describes the text generator *Stéphimallarm* (also titled *RimbaudeL.A.I.R.E.*), produced by A.L.A.M.O. members Roubaud and Pierre Lusson in 1985; the program composed sonnets in the styles of Mallarmé, Arthur Rimbaud, and Charles BaudeL.A.I.R.E.. According to Bootz Les Immatériaux "appeared as a climax for A.L.A.M.O. and as starting point for dynamic poetry which was to develop in the following years" ("Poetic Machinations" 121).

58. Milic also states a narrow view in his entry on "Computer Poetry" in *The New Princeton Encyclopedia of Poetry and Poetics,* writing, "to create poetic objects by this process, syntactic and semantic rules of greater complexity must be devised and constraints such as length of line, meter, and rhyme must be added" (230) (i.e., metrical consideration of words, selecting and grouping words that rhyme in the database are crucial to success).

59. Aarseth, motivated by this lack of focused terminology, has pursued new specifications for variables in computer poems. "What we call computer literature should more accurately be called cyborg literature," writes Aarseth in *Cybertext,* "and it is therefore in need of a criticism and terminology with less clear-cut boundaries between human and machine, creative and automatic, interested and disinterested" (134). He develops three critical positions for his taxonomy of texts: "preprocessing" (the computer is "programmed, configured, and loaded" by an author), "coprocessing" (author and computer produce text together), and "postprocessing" (author chooses some output and discards other) (135). Aarseth asserts that preprocessing is always present but that coprocessing and postprocessing are usually mutually exclusive.

60. Works presented by Loss Pequeño Glazier and Jean-Pierre Balpe at E-Poetry 2003: An International Festival of Digital Poetry demonstrated refined text generation. Glazier's "Io Sono at Swoons" is a Java program that automatically perpetuates

a poem on the WWW. Balpe's "Générations" uses a complex series of dictionaries to instantaneously produce computer-generated texts that are grammatical and automatically foster narrative.

Chapter 2

1. For instance, kinetic activity on the screen is also integral to John Cayley's award-winning poem "riverIsland" and in digital works he and many others produced later, both on and off the WWW (see chap. 5).

2. Also worthy of note in this context is the book *Writing to Be Seen: An Anthology of Later 20th Century Visio-Textual Art,* ed. Bob Grumman and Crag Hill (Kenosha, WI: Light & Dust, 2001), which blends digital and nondigital forms and includes work by Carol Stetser, Scott Helmes, Bill Keith, Joel Lipman, Beining, Marilyn R. Rosenberg, David Cole, K. S. Ernst, Karl Young, Harry Polkinhorn, William L. Fox, and Karl Kempton. Several other notable books on the subject have also appeared: Willard Bohn, *Modern Visual Poetry* (Newark: U of Delaware P, 2001); Irving Weiss, *Visual Voices: The Poem as Print Object* (Port Charlotte, FL: Runaway Spoon, 1994); Harry Polkinhorn, ed., *Visual Poetry: An International Anthology,* spec. issue of *Visible Language* 27.4 (1993); John Byrum and Crag Hill, eds., *Core: A Symposium on Contemporary Visual Poetry* (Mentor, OH: Generator, 1993); Cesar Espinosa, ed., *Corrosive Signs: Essays on Experimental Poetry (Visual, Concrete, Alternative)* (Washington, DC: Maisonneuve, 1990); and Kostelanetz's *Imaged Words and Worded Images* (New York: Outerbridge and Dienstfrey, 1970).

3. In its early stage (1997) *UbuWeb* contained works by seventy-four authors; by 2004 it archived works by nearly four hundred artists, increasing its depth and breadth in all directions.

4. Of these sites, *UbuWeb* is the most extensive, as its focus extends to conceptual poetry, sound poetry, and other forms of avant-garde work. About one-third of the *Light & Dust Anthology*'s contents are visually based. Another site, *Comprepoetica,* contains works by twenty or so authors and is not regularly updated. Sites such as the *Electronic Poetry Center* and Jorge Luiz Antonio's *Brazilian Digital Art and Poetry on the Web* also contain visual works, as do many other WWW sites.

5. Lionel Kearns, in a 1990 interview, succinctly describes the process and results in making animated poetry films in the 1970s (no titles are given): "We had to do it all by hand, making thousands of coloured plastic cells, which we manipulated and shot on the stand one frame at a time. It took months of slogging, and the end results were pretty rough compared with what we can do now with a desk top computer. The problem in those days was that it was difficult to work *as poets* in those media. The tools had not arrived" (110).

6. As an artist and a self-described "post-Cummings poet" (email 2005), Kostelanetz states in *WORDWORKS* that poems should not be read as "lines and other units with beginnings and ends but as *fields*" and was clearly invested in breaking new ground both in poetry and video (100).

7. Prior to this time, writes Schwartz, "We key punched cards/read them in to

create a magnetic tape/read the tape on a Stromberg Carlson Microfilm printer which produced black and white film. I then re-shot the film/created color filters and other effects using an optical bench" (email 2006). For further information regarding work by Schwartz and other artists in this period see Lillian Schwartz and Laurens R. Schwartz, *The Computer Artist's Handbook* (New York: Norton, 1992).

8. Works that feature random motion are also a possibility but are not apparent in works I have viewed from this period.

9. Hardison refers to this piece as "Cool Pop," produced by Marc Adrien [*sic*], dated 1966 (272).

10. Years later Adrian produced a book, *Die Maschinentexte* (Sydney: Gangan Books, 1996), in which some of his experiments in this area are documented.

11. Works such as Stan Vanderbeek's "Poemfield 2" (1971), Paul Sharits's "Word Movie/Fluxfilm 29" (1966), Malcolm Le Grice's "Threshold" (1972), and Paul Glabicki's "Film-Wipe-Film" (1983) all explored these ideas long before the tools to make such works were conveniently accessible (see *Machine Language and Permutations*). I have not seen these works, but at least one of them, "Poemfield 2," remains in circulation, as it was shown in the 2004 "Calculated Cinema" festival in Belgium; see <http://www.constantvzw.com/vj5/CalCinProjEn.html> (accessed Aug. 9, 2004). A brief report by Arthur Layzer on a 1976 program of computer artworks held at Stevens Institute of Technology, "Poets, Birds, Snow, Kites, and the Computer," published in volume 2 of David Ahl's *Best of Creative Computing,* credits Ken Knowlton as a collaborator on "Poemfield," which is described as "animated graphics and poem fragments interplayed with the aid of a general programming language" (111). Other presentations at the event, according to the article, included an artificial voice synthesized by a computer speaking the words of a poem ("Speech Songs" by Charles Dodge); Layzer's "Morning Elevator," an "animated film" constructed out of textured words of his poem; and McCauley's SEX and VIOLENCE poems (111). The technological status of works by Vanderbeek, Sharits, and Glabicki—whether they were made using video equipment (machine integration of digital technology) or by computer programming techniques—is not known.

12. The Boolean Image/Conceptual Typewriter was featured as an interactive installation at the SOFTWARE exhibition. The exhibition, sponsored by American Motors Corporation, was held at the Jewish Museum (New York; Sep.–Nov. 1970) and the Smithsonian Institution (Washington; Dec. 1970–Feb. 1971). Other significant literary aspects to this event were the first public demonstration of a hypertext system (Ted Nelson's *Labyrinth*) and John Giorno's "Radio Free Poetry," which broadcast the works of many major contemporary poets from within the museum.

13. In *Concrete Poetry: A World View* (1970) Mary Ellen Solt addresses Fernbach-Flarsheim's work as a variation of concretism and declares his interest "in bringing into the poem materials and methods made available by technology in both visual and phonetic poetry" (58). Excerpts from a letter by Fernbach-Flarsheim are included, in which he discusses another project, "Random Generator Program," which was made with FORTRAN (the coding of which, he suggests, can be consid-

ered a poem due to its inflexible structure). This piece, he writes, "is an input tape which feeds a large group of random symbols to the machine and lets the machine react to those symbols under the control of our program" (Solt 58). Though no examples of output are shown, the author's mechanical description of the piece provides some insight to the technical complexity and aleatoric character of his works: "The languages with which we address the computer are of two types: low level (example: S. P. S., Autocoder) or high level (example: Cobol, FORTRAN, Pl/1 [the latter is an adaptation or dialect of ALGOL]). We can program a computer to react by some type of logic to a RANDOM structured input. Then the result—seemingly unpredictable—is as predictable as the score in a baseball game if we make up the rules and have no control over who comes up to bat and who is out in field" (58). The response of the program (written by the poet-programmer) to the input materials (also provided by the poet) produces random and irregular expression. Solt also introduces two more of Fernbach-Flarsheim's self-defined "poems for creative and non-creative computers," "Poem 1" and "Saturday, August 27," which are, "poet generated" (58). Worthy of note is Solt's view (c. 1970) that "we have yet to see an impressive poem or word object made by the computer" (58).

14. For detailed discussion of the interconnection between concretism and digital poetry see Friedrich W. Block's essay "Digital Poetics or On the Evolution of Experimental Media Poetry" <http://www.netzliteratur.net> and writings by Roberto Simanowski ("Concrete Poetry in Digital Media: Its Predecessors, Its Presence and Its Future" <http://www.dichtung-digital.com/2004/3-Simanowski.htm#0>) that address the subject.

15. Knowing the methods of programming, composition agenda, and database parameters for more of the poems would enable an extension of the discussion of works published in *Computer Poems.* Only two poets in the collection—Pete Kilgannon ("written by Elliott 4150 computer and algol program") and Edwin Morgan's "The Birkie and the Howdie (Lowland Scots)" ("based on the glossaries of the collected poems of John Clare and Robert Burns respectively")—reveal any information about their programming (22, 43). Without the benefit of practical technical information, the educational value of the work—what can be learned from the combination of content and methods—is primarily conceptual. What these poems really consist of remains a mystery; a reader must absorb them at face value just as any other poem. Because of this absence of technical data, the reader is left to guess at any structural logic or patterning. On the other hand, the content and quality of work can be read without biases that could be presented if the methods or subtextual contents were revealed.

16. In a different type of production, McCauley unites German and English words perpendicularly; the computer is provided with a list of words and a formula (program) that alters the shaping of each paired unit, as well as its placement on the page. The words and characters involved with this poem stem from her novel *Happenthing in Travel On;* two lists of words are made for each of her book's characters. McCauley selected only German words that also function as words in English. The

program was written so as to print the combined words randomly so the German words appear horizontally but otherwise, writes McCauley in *Computers and Creativity,* "randomly in anagram-like pairs" (110). An example of output regarding a character who is a frightened student is provided. Output is not patterned consistently; the accumulation of signs as symbols is loosely directed, haphazard by intent. Though the pairing of the words is intentional—which gives it a double function as a learning tool—the relationships between these perpendicular pairings, sixteen separate images in the example she shows, do not portray a meaningful interconnection as a visual image. Thus, the poem's relation to the initiatives of concretism is unclear. In terms of the placement of symbols on a page, the author has randomized something that was formerly forged with a communicative objective. Shapes and symbols form and are reformed without any particular structural intent. Rather than represent a literal image, the program creates a unique conglomeration every time it is run. McCauley explains that her purpose was to find a new way to present narrative through the use of "verbal portraits" of the characters (111). It is plausible that this is an effective method by which viewers could familiarize themselves with characters, or even scenes of a story—though the work as described here would have to be expanded greatly to accomplish more than that.

17. Knowlton also practiced an alternative but related approach in creating strictly visual work. His 1975 collaboration with Leon Harmon, "Image Processing," is briefly discussed in Julio Plaza's 1998 study *Processos criativos com os meios eletrônicos: Poéticas digitais* (Creative Processes with Electronic Media: Digital Poetics). In the example shown in that collection Knowlton uses only tiny square symbols, each a single mark (including trees, cars, telephones, smiling and frowning faces, peace signs, airplanes, animals, stars, swastikas, ladders, rocket ships, and other icons); the individual symbol carries little cumulative meaning, if any, as do the words of a poem. The same overall visual effect is achieved, however, as a crisp image of two birds soaring beneath clouds emerges from the amassed symbols that result from, as Plaza writes, "the translation between codes" (206). A computer program generates the output image using various symbols that, when visually decoded, portray an overt image. Plaza's study also discusses a similar approach to styling visual poetry that was explored by Waldemar Cordeiro, who used alphanumeric information and/or other IBM keyboard symbols (e.g., slash marks), sometimes in layers, to create the image of a man's facial profile in his 1975 work "Gente" ("Man") (206).

18. The Barbadian Kamau Brathwaite is another poet who, after acquiring his first Macintosh computer, began to make complex graphical gestures using Microsoft Word. Beginning in the early 1990s, Brathwaite began to cultivate what he calls a "Sycorax video-style" in his books, which use varying fonts, sizes, and the inclusion of pictographic symbols for meaningful effect. See *Barabajan Poems* (New York: Savacou North, 1994); *ConVERSations with Nathaniel Mackey* (Staten Island, NY: We Press & Xcp: Cross-Cultural Poetics, 1999).

19. This assertion is meant literally; Souza (an engineer) was the first to use a computer to make graphical poetry. Artists such as Waldemar Cordeiro were con-

currently making art that contained verbal symbols (see note 17 above), which are also viewed by some as digital poetry. Furthermore, at this time a group in Brazil practiced "process poetry," which was often portrayed as an analog equivalent to what was occurring in digital poetry. For example, José de Arimatheia's "Untitled" (1974) showed related (sequential) visual poems in multiple panels on the same page, and Wlademir Dias-Pino treated poetry as an object, giving it "tridimensional" qualities.

20. Padín's online biography states that he has "exhibited collectively in more than 207 expositions and in more than 1,500 mail art shows from 1969 to 2002." The "Mail Art" movement grew out of Fluxus, emerging in the 1960s (a rough plan established by Ray Johnson's *New York Correspondence School of Art* in 1962), then thrived in the 1970s around publications such as *Arte Postale!* (Italy), *Commonpress* (Poland), *Notebook One* (Canada), and through a network of international artists (including dbqp and Xexoxial Endarchy, who published Padín's book *Signographics & Texts*). According to Craig Saper's *Networked Art,* in 1977 Padín was jailed for more than two years for "hurting the morale and reputation of the army" after staging "a 'Counter Biennial' in front of the Latin American section of the Tenth Biennial in Paris" (66).

21. A Spanish version of "Oxímoron" was also created and is available via *Annetna Nepo: A Multi-lingual Poetry Review* <http://www.literaturas.com/1HiperbrevesVisuales2002.htm> (accessed Aug. 14, 2004).

22. *Vispo* (an abbreviation for visual poetry), launched in 1995, is mainly a vehicle for the dissemination of Andrews's visual and, later, sound poems, tools, and games, though he does host works by several others, including Nari, Ana María Uribe, Dan Waber, Padín, and Jorge Luiz Antonio's *Brazilian Digital Art and Poetry on the Web.* See <http://www.vispo.com>.

23. Huth's press began in 1987 and by 1995 had published 250 titles, including almost one hundred issues of *The Subtle Journal of Raw Coinage* (described on the dbqp WWW site as "the once-monthly aglossary of the becoming tongue, a selection of words invented by people"), nearly all of which contain digital effects.

24. Nine editions of this French journal were produced on floppy diskette (along with booklets, Atari files, and audio cassettes) by the L.A.I.R.E. group between 1989 and 1993; with the exception of the audio components these electronic periodicals are now encapsulated on the CD-ROM *Le salon de lecture électronique,* republished in 1995 by Philippe Bootz's imprint Mots-Voir. The essay "Poetic Machinations," in which Bootz traces the history of French new media poetry, mentions a few other French periodicals produced in the 1980s and 1990s: *Art Access* (published on the Minitel system, 1985–86), *KAOS* (edited by Jean-Pierre Balpe, 1991–94), Paul Nagy's video magazine *p'Art* (started in 1987), *DOC(K)S* (a "sound, visual or spatialist" review founded by Julian Blaine in the 1960s), and *Action Poétique* (which did a special issue on A.L.A.M.O. in 1984 and a diskette edition in 1992) (Bootz 120–27). The bilingual proceedings of a 1993 colloquium, *A:\Litterature* (copublished by Mots-Voir and the University of Lille 3), was also, writes Bootz, "an important book to under-

stand the French position because it was the first time that every tendency met together" (email 2005).

25. *First Screening* was later transferred and released on diskette using HyperCard by Red Deer College Press.

26. In *The Alchemist,* where a selection of *First Screening* poems also appeared, viewers are advised that some of Nichol's works require "lower case capability," a fact that underscores the minimal capabilities of the machines on which these works were originally produced and viewed.

27. In another piece, "Off-Screen Romance," the words *FRED* and *GINGER* (referencing Fred Astaire and Ginger Rogers) are programmed to dance on the screen. The words break apart, come together and move synchronously for a few seconds before breaking apart again. These actions and movements are repeated throughout the duration of the work: characters dance while the words flicker and move; they change positions, separate, move to the edges, and so on.

28. In the first part of the poem *train* moves slowly at the bottom of the screen, leaving a trail of letters (i.e., "ttttttttttttttttrain") until a drastic visual shift occurs and *train* appears repeated across the screen in a nine-by-twelve grid. At this point letters gradually disappear so that the word dissolves (i.e., *rain, ain, in, n*) as the columns scroll and wobble. Geof Huth later used the trail-like effect seen in "Poem for My Father" in his piece "Inchworm" (1986) and comments, "I always have thought that this poem was directly influenced by Carlo Belloli's simple proto-concrete poem, 'treni,' which appears in both *Concrete Poetry: A World View* and Williams' *Anthology of Concrete Poetry.* Nichol has to have seen this poem, since he had pieces in both of those books" (email 2005).

29. Many of the effects incorporated in *First Screening* are also incorporated in *Déjà vu* and *The Alchemist,* a literary arts magazine edited by Marco Fraticelli in Quebec, which produced an electronic edition (on diskette) edited by Richard O'Donnell in 1984. As in Nichol's work, these publications used the programming language BASIC. *Déjà vu* featured poems by Fraticelli (haiku, incidentally) and O'Donnell that use kinetic effects to manifest objects (e.g., spiderwebs) or actions (e.g., snow falling) in the poem. O'Donnell's "Special Watch" uses the same effects (flashing, scrolling text, etc.) and is significant only in the way it begins to intimate hypertext (an effect achieved because from any section the viewer can access a menu of contents should they not wish to read the works as editorially ordered by following the default path). Huth's first kinetic poem, "Inchworms," was written in Apple Basic on an Apple II computer and composed, writes Huth in "Digital Poetry Incunabula," "so that it would crawl across the screen—a simple visual trope." At first the words *INCH* and *WORM* appear on separate lines, which then slowly begin to stretch out across the screen. The letters *I* and *W* leave a trace of the words' presence behind and flowing onto subsequent lines until six lines across the screen have been filled. This work directly descends from Nichol's "Poem for My Father," in which the language visually represents its own particular activity.

30. *Apaga* can also be translated as "turn off," which presents a slightly different meaning within the context of the artist using the computer as a vehicle for communication.

31. Plaza also discusses two works by Arnaldo Antunes, *NOME* (Name) and *Cultura* (Culture) (both 1993), in which Antunes, producer of many refined visual and sound poems, projects language, imagery, and sound treated with various technical effects. In *NOME,* a collaborative work between Antunes, Clelia Catunda, Kiko Mistrorigo, and Zaba Moreau, words are layered atop each other in various sizes, vibrant colors, and different planes on the screen in a manner similar to that of Kostelanetz. The multidimensional verbal information, accompanied by a soundtrack created by Antunes, is perpetually in motion. The overall effect of the combination of elements here is one of, to borrow Stefans's phrase, "noise," on both visual and verbal registers. One inference made by the piece is that the idea of the self, and what the self (designated by a name) is, or has to say, is a complex and overwhelming proposition. *Cultura* employs an entirely different approach in its construction and delivery of message. Against a dark background, a series of couplets are juxtaposed with rudimentary images of various birds, mammals, and reptiles. The mode of expression is unusual because it unites a folk-art aesthetic with fanciful high technology. Roughly cutout shapes of progenerative imagery (sperm, eggs, sexual acts) are combined with expressive rhymes.

32. Though concretism was, and remains, a distinct and important influence in Brazil and elsewhere, not all multimedia artists aspired to reembody its tenets. For instance, Brazilian digital poets like Philadelpho Menezes and Wilton Azevedo sought to develop methods that were contrary to concretist practice, notably in works included on the CD-ROM *Interpoesia* (1997–98).

33. In the essay Melo e Castro defines *infopoetry* as work that involves computers that permit the treatment and production of texts determined by morphological and syntactic functions (58).

34. This information is provided by Kac in the readme file associated with Pestana's work included on Kac's *International Anthology of Digital Poetry* CD-ROM. Coincidentally, the version of the poem shown by Kac is dedicated to Melo e Castro.

35. Huth reports that he has been able to recreate this piece for viewers (fifteen years later) through an Apple II emulator program (email 2005).

36. It would be remiss not to note the current status of Huth's earliest works (which is the case, I expect, of many works from the 1960s, 1970s, and 1980s), as reported in "Digital Poetry Incunabula": "All I have left of these early visual poems is a printout of all the code and a silent videotape of the poems. I'm still trying to figure out how to bring these poems back to life, how to run them on a contemporary computing platform."

37. The notion of *effort* should not be trivialized here. When I asked Bootz how most of the pieces that appeared in *Alire* were digitally constructed, he sent this reply:

We had to construct and program algorithms that were able to draw letters with lines designed by a set of values (relative coordinates of each segment) and, secondly, we had to create algorithms that calculated the absolute coordinates of each letter of the text that was input in line code. We were creating a graphical environment similar to windows, able to put on screen a graphical text from ascii data. Tibor [Papp] had created one alphabet, but with spaces between letters that were natural spaces, differently for each couple of letters (he is a typographer), and I had created two fonts with constant space between letters. In the third step, the program describes the screen at each time. It acts as a program of "description of page" like HTML, but uses time. The time was governed by loops (a loop that makes nothing). It was the only way we had found to create time in Basic. In 1993, the texts were no longer readable because the computers counted to[o] fast. I have reprogrammed each text by inserting measures of movement and processes (the initial testing that appear[s] at the installation of the "Salon de lecture"). The program compares the result of these tests. . . . It adapts the waiting between each word. In fact, this adaptation preserves the readability of the texts but not the aesthetic of the moving. In [the] original version, each letter took time to be drawn, and all the moving was rhythmed by a specific tempo that results from the time of drawing: each letter appeared in time, the word was not written in one block.

In my programs, the fonts were stored in text files that contain the Basic codes to execute. These text files are named with the suffix .fnt. They can be open[ed] with the notepad. Effects were also programmed. The bitmaps were stored by part in tables, each of these were stored in a data file. The resolution of the bitmap was coded with the suffix of the file. The suffix .cga or .bcg are relatives to two different codages (one of these we had created) of a cga picture. .ega or .beg are relative to .ega pictures and .vga or .bvg to vga pictures. Some files of configuration (.cfg, they can be open[ed] by notepad) were used to indicate to the program the relation between the picture and the files. When a programmed effect was too long to calculate, the result was stored in a file of points (.pt). They were the coordinate and the rgb values of the points that were stored in this files. These points were read at running. It was possible to program effects in the data, the program was used as a[n] interpreter; these data are .brk files. They can be opened with notepad. So, it was possible to modify the "texte-écrit" without coding. Complex effects use this technique. The general program used an init file of configuration (.cfg, that can be opened with notepad). (email 2004)

38. Although I believe it is important to provide illustrations to bring an image of a work to the reader, it should be mentioned that, as Bootz writes in "Poetic Machinations," "any display of a 'generated text,' outside its generation context, is

as significant an abbreviation and a deviation, as the display of a poster or a photograph instead of a film" (126).

39. Bootz also developed other effective methods of programming text. For example, "Proposition" (*Alire* 5) is one of the most basic, straightforward presentations in any issue of *Alire.* A ten-line poem in two stanzas appears line by line from the bottom of the screen to the top. The viewer confronts what is normally considered the last line in the second of two stanzas first. When the third line appears, which is the last line in the top stanza, the construction pauses briefly, giving the impression that it is the title. However, the first two lines of the poem then appear above it. The order in which one reads lines makes a difference, and reading in reverse is difficult to follow. Here the poem is not complete until the first line is shown, at which point it more sensibly communicates. Bootz's programming of the piece ultimately delivers a linear work with minimal graphical attributes, but the process of getting to the completed text requires viewers to wait and wonder while the poem is forming amidst some visual complexity. This is a style Bootz also employs in "En réponse à la lampe" (*Alire* 6).

40. Bootz and Dutey both created several poems of this type that appear in *Alire,* as did several other poets, including Patrick Burgaud, Claude Maillard and Tibor Papp, and Frédéric Develay.

41. A pair of CD-ROMs titled *Poetry in Motion* (Voyager) were, technically, the first anthologies of contemporary poetry produced in multimedia format. Adapted directly from Ron Mann's video (originally a film), these CD-ROMs rely heavily on miniaturized versions of the performances and interview/commentary segments documented in the video. A step beyond a printed literary anthology, this publication includes the author's voice and a rendering of their performance style alongside a typographical text. Readers make their way through the poetry via an index located on a pull-down menu. The design of *Poetry in Motion I* (1993)—whose structure is reinscribed in *Poetry in Motion II* (1995)—may be criticized because no biographies of the poets, bibliographies, or information about where and when the interviews and readings took place are given. Both CD-ROMs are without intertextual links to either secondary materials or between materials. What is presented are the performances and interviews from Mann's film and, in *Poetry in Motion II,* outtakes from it. These segments are unquestionably useful as an introduction for newcomers to performance poetry. Some of the most ambitious American performance poets of the century—including Ginsberg, Waldman, Amiri Baraka, Jayne Cortez, Giorno, Miguel Algarín, and Jerome Rothenberg—are featured in *Poetry in Motion.* Decontextualizing the work of these writers, however—leaving the reader with little post-textual substance to follow up on—is a glaringly inhibited way to present literature in this potentially expansive digital form. The editors could have easily compiled background information and linked it to the poets' materials on the CD-ROM without damaging the integrity of the original production. In fact, had they done so, a layer of some value—easily enabled by the technology—could have been added

to the project. Also, by programming in a connection to the Internet, materials linked to any number of scholarly databases could be connected through a publisher-maintained resource site. Readers would be able to use these CD-ROMs as portals into a much larger assemblage of related texts. A direct link from the CD-ROM to a thoroughly developed version of the *Poetry in Motion* WWW site (including connections to encyclopedic resources) would have furthered the idea of poetry in motion for viewers capable of navigating their way through archives located on various Internet nodes. Such a mechanism could have easily been programmed into *Poetry in Motion II,* which was produced as the WWW was emerging and also into *The Beat Experience* CD-ROM (1996).

The Beat Experience CD-ROM was another instance of a nonhypertextual multimedia production that used the computer to project sounds, images, and video clips but not interlink them. In actuality, an inexplicable absence of Beat Generation writing in any form diminishes the potency of this CD-ROM, defying rather than defining the potentials for both hypertext and literature. Photographs, video fragments of cultural surroundings, and sound bites of writings represent the poets associated with the group. The only written language to be found, besides a modicum of biographical and contextual data, is unlinked excerpts from *Naked Lunch, On the Road,* and *HOWL.* Through samples of Beat poetry and related milieus, various cultural connections and conditions between these writers and an era gone by are indicated, but only a few of its shards are sealed in this project. To its credit, Voyager initially developed an interesting, if problematic, *Beat Experience* WWW site. Animations and images are presented in a way that simulated the CD-ROM. Yet only superficial content was presented. Readers without graphical browsers would find only an advertisement at this site. The purpose of *The Beat Experience* is not quite clear; in essence it aspires to reflect and simulate the environment of the lives of the Beat writers and artists, yet it is questionable that such a feat could be accomplished on the computer screen. The editors have created a vaguely literary product that could have branched into something far more substantive and interesting. An intensive interactive poetic and social fabric exists in the relationships between and concerns shared by the Beat poets. This is keenly illustrated in *BEAT CULTURE and the NEW AMERICA, 1950–1965,* a dense and fascinating catalog of images and literary criticism compiled in conjunction with a major exhibition at the Whitney Museum of American Art. *The Beat Experience* was also created as a result of this event. Had the two titles worked in conjunction with each other, limitations in print media (i.e., no sound, the expense of color plates) and the lack of substance on the CD-ROM would have been appeased, though neither collection contains much of the actual literature. *The Beat Experience* lacks intellectual and networked development; viewers are not presented with an enriching interactive experience. Directing readers (either by reference or built-in link) to a WWW site would be the first step in extending outward. Background materials on the writers and their writings, their interpersonal connections and influences, which the CD-ROM lacks, could be presented. A branch to texts would be an excellent complement to *The Beat Experience;*

since Michael McClure, William Burroughs, Jack Kerouac, and other Beat writers already have WWW sites dedicated to their work, might it not be interesting to program opportunities for readers to be brought to this possible present rather than plunging them into the past? It is almost ironic that the annotated version of *HOWL* printed by Harper & Row in 1986 is actually much more hypertextual and contextual (though it does not have electronic links, sound clips, or moving images) than this CD-ROM. A short stride in the progression of digital literary arts, *The Beat Experience* is a slick pseudodocumentary of a literary movement.

Developing such ideas for these particular projects is no longer feasible because less than half a decade later, Voyager Company collapsed, and neither the CD-ROM nor the WWW sites are available any longer. The idea of developing CD-ROMs in conjunction with the Internet is, nonetheless, worth considering. When the equipment, capable of being used in such a way, is more fully utilized, the historical identity and function of discretely produced literary titles will be altered by enabling extensions outward.

42. According to Nicole Peyrafitte, who assisted with translations of these works, the phrase "en toutes letters" is also colloquial slang that implies "I am spelling it out for you."

43. In a subsequent work by Bootz the "sur-texte" is established by different means. "À bribes abattues" ("From Fervent Brief Sentences" [*Alire* 9]) is structured to give viewers the opportunity to view what is roughly the same poem with six different kinetic treatments that shuffle language on the screen. Some parts, or phrases, tend to be fixed, and others are in flux, reminiscent of Bootz's earlier views and presentation of matrix poetry. The same, or similar, language is presented in each of the iterations ("bribes"), which are given different adjectival classifications on the opening page (plain orange text on black): "soft," "nostalgic," "realistic," "pessimistic," "romantic," and "from fervent brief sentences." Bootz presents multiple mediated possibilities for the poem; the interactive component solely involves the viewer making a selection. Each version shares aesthetic techniques and tendencies, several begin with the word *va* and then begin to diverge in presentation; *va* (which means "go") is variously used to form words such as *vague* or *vas.* Identical language, with some additions and derivations, reappears in every piece. Each minor difference communicates new messages. Though the same structures are used in several of the pieces, the manner in which they are rearranged and mixed with other verbal components enables multiple reflections or perspectives to be built from the core materials. As in many other works presented in *Alire,* words replace and erase each other and continuously shift—before the viewer's gaze—into other linguistic combinations; words merge from disparate areas of the screen to form new words and trade places with each other to alter the projected message; language is put into motion throughout. The ordering and varied processing of the letters, words, and phrases establish the differentiation between each of the poems, according to the senses Bootz contrives for them at the start.

44. A nonkinetic, hypertext WWW site (html) has been developed that emulates

the effects of the program, though the texts in the database are still images that are not generated by a program; the only kinetic aspect of the site is the opening page, which features an animated sequence of graphical fragments that contain text; see <http://www.synesthesie.com/heterophonies/theories/donguy/tagsurf/> (accessed July 15, 2004).

45. These pieces are available for download on Kendall's WWW site <http://www.wordcircuits.org>.

46. "4320," Sondheim explains in *Meta,* was made at Brown University with a program created by Charles Strauss ("a Meta/4 in conjunction with a Vector General Interface" [a]).

47. The technical description is included in *Meta:* "A 3-space projection of a hypercube (4-space measure polytope) was presented on a crt. With zero/axing the z' coordinate (zero rotation, 4-cube orthogonal to 3-space), a cube (3-space measure polytope) could be created. Again, zero/axing the z coordinate produced a square (2-space measure polytope). The inversion mechanism could reduce the square to a point: 0-space" (a). The controls included shading; vertical and horizontal movement; x-, y-, and z-rotation; speed; and oscillatory state.

48. The phrase "Voies de faits," according to translator Nicole Peyrafitte, also has a legal meaning that implies aggression.

49. In another work, "Je t'aimerai" (I will love you), Dutey presents nine nonverbal symbols arranged in a three-by-three grid of buttons at the center of the screen. By selecting one of the images, the viewer encounters one of nine brief kinetic verbal-visual presentations made by stringing together lines of a litany or chant poem in which each new sentence begins with the title's phrase. Ten unique segments, each of which involves ways of postponing or avoiding love, are presented in all; each segment contains a different form or combination of kinetic processing. Dutey has devised a list poem that repeats the phrase "I will love you . . . " into nine parts and creates a variant method of programming each of the parts. Each of the parts, though often cliché, is charged with a dynamic unique and relevant to the text, which at points resembles a dialogue in which two voices transmitting at once drown each other out.

50. In the WWW rendering, which is a Flash movie, users navigate between two images that morph into each other when clicked. See <http://www.andrevallias.com/poemas/io.htm> (accessed Oct. 2, 2006).

51. In an installation environment, which is how the piece was originally presented, the viewer would rotate the ball, though it is unclear what, if any, audio component is present (in the demonstration of the piece activated, a voice begins to intone the words accompanied by synthesizer soundtrack). I can imagine two possibilities for sonic accompaniment: a prerecorded, processed soundtrack (as in the demonstration) or as sound bites of each word that are activated in conjunction with the movement of the sphere. The latter idea would be the most effective implementation of technology, as it would enable viewers to create their own sound poem using the words established and programmed by the author.

52. For details on this event, and contexts built for concretism by Wilton Azevedo, Giselle Beiguelman, Friedrich Block, Roberto Simanowski, and others participating in the event, see my report "E-Poetry 2003: An International Festival of Digital Poetry," published by the Hermenia Research Group (Barcelona, Spain) in 2004, <http://www.uoc.edu/in3/hermeneia/sala_de_premsa/E_Poetry_2003.pdf> (accessed May 25, 2006).

53. The importance of the ideogram to this process is described and celebrated by Espinosa for its use of "direct juxtaposition—analogical, not logical-discursive—of elements" (16).

Chapter 3

1. In *Computer Lib/Dream Machines* Nelson describes and celebrates the work of his cybernetic predecessors and comrades, such as Vannevar Bush, father of the Memex (MEMory EXtender) machine and author of the essay "As We May Think," Douglas Englebart (inventor of the mouse and early hypertext prototypes), and Gordon Pask. Nelson outlines his own contributions to the field, as well as those by other pioneering engineers and artists (several projects by Ken Knowlton and Lillian Schwartz are introduced). In this book he introduces *Xanadu,* his dream, "to give you a screen in your home from which you can see into the world's hypertext libraries. (The fact that the world doesn't *have* any hypertext libraries—yet—is a minor point)" (56).

2. This topic is discussed more thoroughly in a chapter of Bolter's *Writing Space* (2nd ed.) titled "The Breakout of the Visual."

3. An early (1995) publication by Eastgate Systems, Christiane Paul's *Unreal City,* is a hypertext guide to T. S. Eliot's *The Waste Land.* This is an odd publication in that the text of the poem is not provided in computer format; it appears only in printed form.

4. A video recording of a December 1968 demonstration of "Augment" by Englebart appears on the CD-ROM companion to *The New Media Reader,* edited by Noah Wardrip-Fruin and Nick Montfort (2003).

5. As noted previously, many of the initial hypertextual poems were produced using the software program HyperCard because it was shipped as a standard piece of software with all Macintosh computers. HyperCard is a hypermedia presentation mechanism with a powerful scripting language whose basic functions are easily learned by beginners. Buttons easily enabled by the program's graphical user interface (GUI) allow a reader to move between stacks (i.e., screens) and text boxes with scroll-bars. In HyperCard productions alphabetic and visual texts are arranged on a series of easy-to-use "stacks" of "cards" through which users can navigate and search for information.

6. Eastgate operates an up-to-date WWW site <http://www.eastgate.com> and for years has circulated a catalog in order to draw attention to its products.

7. Approximately two dozen commercially produced Storyspace titles—both in

poetry and prose—are in circulation. This study does not examine all of the digital poetry that has been produced using Storyspace; it offers observations on several titles I have been able to view. There are several other Storyspace titles in print that are not analyzed here, including Judith Kerman's *Mothering* and Stephanie Strickland's *True North* (published 1997). Strickland's essay in *Electronic Book Review* 5, "Poetry in the Electronic Environment," discusses and contextualizes her work in detail. Other works, such as Michael Joyce's *Twilight: A Symphony,* are genre-blurring but fall largely into the category of fiction.

8. As explained in *Getting Started with Storyspace,* "Different views present the same information in different ways. Anything you can do in a Storyspace map, you can also do in a chart or outline. Which view you use is a matter of personal preference" (13). For diagrams of Storyspace maps see Mark Bernstein's essay "Patterns of Hypertext" <http://www.eastgate.com/patterns/Print.html>, an example from Kate Bishop's "A Teenager's Dreams" <http://www.georgetown.edu/faculty/bassr/bishop/storymap.htm>, and "The Water Project: Examples of Student Projects" <http://coe.ksu.edu/McGrath/NECC/Examples.htm> (accessed Dec. 13, 2005).

9. Joyce further describes constructive hypertexts as tools for perpetually "inventing, discovering, viewing and testing multiple, alternative organizational structures as well as a tool for comparing these structures of thought with more traditional ones and transforming one into the other" (44). This mode is predominantly used in pedagogical situations, with a "focus upon the discovery of coherent structures and linkages, using a full range of cognitive skills, especially visual ones, to discover new structures and linkages" (47). In his book Joyce extensively chronicles his pedagogical work in this area, as well as that of select others, but does not address any literature of this sort besides the Hypertext Hotel project (see chap. 4).

10. Edward Falco's *Sea Island* (*Eastgate Quarterly Review of Hypertext* 2.1 [summer 1995])—a collection of ten hypertext poems programmed with Storyspace (maps, tree maps, and chart views can be used to navigate between disparate strands of the poems)—is an example of such work.

11. According to Kendall's essay "Writing for the New Millennium," the poem was originally published by a group called Hyperion SoftWord in 1990. A brief discussion of "Everglade" can be found online as part of *The Electronic Labyrinth* <http://www3.iath.virginia.edu/elab/hfl0181.html>, and the poem is also published on the CD-ROM *EARLY eBOOKS* (San Simeon, CA: Serendipity Systems, 1991).

12. It also appears on the *International Anthology of Digital Poetry* CD that Kac produced for PC and Macintosh (1996–97).

13. These poems were also programmed using HyperCard; along with "Accomplished Night" (1988–90), they appear on *The New Media Reader* companion CD-ROM (with a preface by Deena Larsen).

14. A prototype of this work appeared in *The Little Magazine,* vol. 21 (1995), though it is not as elaborate as the later version, which contains sections/features titled "Aftertaste" and "Spices" and a different array of pop-up menus.

15. Eastgate published several other link node–type hypermedia poems at this

time. Kathryn Cramer's *In Small & Large Pieces* (*Eastgate Quarterly Review of Hypertext* 1.3 [1994]) uses Storyspace to hypertextually arrange a mix of poetry and prose without implementing maps, tree maps, or chart views. Kathy Mac's *Unnatural Habitats* (Eastgate, 1995) uses hyperlinked words, tree maps, chart views, and a Storyspace map, as well as a graphical poem, to enable navigation. Richard Gess's *Mahasukha Halo* (*Eastgate Quarterly Review of Hypertext* 2.1 [summer 1995]) is navigated by clicking on the text or image hotspots (i.e., links), by menu, or by using a Storyspace map, a tree map, or in outline view (whose toolbars feature a compass-like icon whose cardinal points bring the reader to sequential and nonsequential layers of text and to a pop-up menu of links).

16. *Intergrams* was published as vol. 1.1 of the *Eastgate Quarterly Review of Hypertext* (1993).

17. Rosenberg's other major work of this period, *DIFFRACTIONS THROUGH: Thirst weep ransack (frailty) veer tide elegy,* was produced by Rosenberg in 1993 and later published with *THE BARRIER FRAMES* in the *Eastgate Quarterly Review of Hypertext* 2.3 (1996). This piece employs many of the same basic techniques as *Intergrams* but operates in a slightly different manner, and each word cluster interface is more complicated, with words and syntactical symbols appearing in different typefaces.

18. At least two simulations of this work, prepared for the WWW using Java, are available on Rosenberg's Web site <http://www.well.com/user/jer/inter_works.html> (accessed Feb. 22, 2005).

19. John Cayley wrote a review of this event, which was adjunct to the 1997 Association for Computing Machinery Hypertext conference. The review was published on the *Electronic Book Review* Web site. See <http://www.electronicbookreview.com/v3/servlet/ebr?essay_id=cayl eyce&command=view_essay> (accessed July 22, 2004).

20. "Interpretive"/"Textonic" and "explorative"/"constructive" are theoretical formations used by Espen Aarseth and Joyce, respectively, to describe a hypertext to which the viewer can add materials.

21. In "Digital Domain of Works," a 2003 project proposal submitted to the Guggenheim Foundation, Györi specifies a head-mounted display as the interface mechanism.

22. This also seemed to be the objective of Laurie Anderson's CD-ROM *Puppet Motel* (Voyager, 1995), which was not conceived as a literary work but as a piece of multimedia art. The viewer is presented with a virtual space—in the form of a postmodern, industrial motel—and is left to discover samples of art and language performed in various "rooms" therein. The reader finds poetry, music, video clips—Laurie Anderson playfully at work. Some of the linking structures in *Puppet Motel* are unconventional because they are made through visual signals that are not obvious. Anderson's project requires the reader to carefully examine all areas of the screen in order to navigate through the "motel," with very few instructions along the way. Beyond whatever Anderson's already high-tech art brings to this medium,

Puppet Motel is also the first CD-ROM that contains a built-in mechanism that enables links to the WWW, connecting *Puppet Motel* to Anderson's WWW site at Voyager, *The Green Room,* which links to Anderson's performance schedule, hints for *Puppet Motel,* bulletin boards, and other information. *Puppet Motel* is a potential standard for future modes of electronic publication. Anderson's WWW site at Voyager, *The Green Room,* was maintained by a fan of Anderson's even after the collapse of Voyager but unfortunately has been taken offline.

23. See "The Virtual Poetry Domain" <http://www.cosignconference.org/cosign2002/papers/Gyori.pdf>; and "Aided Creation in VPoetry?: A Quick Approach to the Poetry of the Next Century" <http://www.sitec.fr/users/akenatondocks/docks-datas_f/forums_f/theory_f/gyori_f/gyori.html> (accessed Jan. 18, 2006).

24. Incidentally, the essay by Papp included with this issue addresses and historicizes the specificity of the machine as a tool used to activate the senses as heralding the birth of new literary works and forms of writing.

25. Cayley uses a prefabricated link-node hypertext structure to house the active materials, using basic mechanisms to organize or index materials. To this end his works are always well organized, thorough in explanation, and easy to navigate.

26. As explained in essays on Cayley's WWW site, he prefers to classify his works as "machine modulated." Prior to the WWW Cayley published all of his works on diskette via his own publishing house, Wellsweep (London). As in the example of the *Alire* research group, the author was responsible not only for creating the artwork but also for producing it in order to get it into circulation.

27. Since Macintosh computers no longer use diskette drives, this is the only sensible way to circulate these works. In order to explore the stacks of files, the viewer would need to have HyperCard software or a (downloadable) HyperCard emulator program.

28. Describing ArtEngine in an online interview with Judy Malloy, Truck explained that his program "takes two images given by the artist and from them, constructs a new third image. The Engine can remember this image and then combine it with other given images. The interaction here can be quite subtle, as the artist manipulates the data given the Engine to modify the program's logical process" (Truck).

29. Some of the introductory section is very edifying, some fanciful. To give just one example: Cayley defines the "SINGLE-SENTENCE OR TWENTY-SIX-WORD-STORY ABCEDARIAN OR HEAD-ACROSTIC" as "a sentence or story or story-sentence the first word begins A as in Another or Awakened the second word begins B as in Bloody or By the third C as in Clod or Care the fourth D as in Damn or Dawn and so on to a last twenty-sixth in the modern Roman alphabet word beginning Z say Zeroes or Zilch so there are words for all letters in the tiny universe of xxvi elements and each word can replace each letter in the original sentence to make a new story beginning for example Another Near Obsessive Time Had Each Realized or Awakened While Awakened Knowing Enfolds Night Enfolds Dawn and so on

making the FIRST TRANSFORMATION of the NET or HOLOGOGRAM which of course itself may be transformed."

30. The other segments of this section of *Moods & Conjunctions* perform in a similar way. "Modal Element 3" draws from a sixteen-line Given Text on language. The two other sections that present a single plane of collocational text, "Critical Theory" and "the sentence re-read," also operate in the same manner. "Critical Theory" draws from forty-six lines that address qualities of contemporary artifice in order to arrange new statements; "the sentence re-read" comes from an unknown source and is the only single-plane text that does not invite user input via the mouse.

31. The given texts in *Leaving the City* are much longer than those in *Moods & Conjunctions.* The impact is significant. With a larger word and more complex word base, the syntax is less fluid. Another effect of the larger pool of words from which the program has to choose cannot be captured in a static representation of the text: onscreen pauses occur as the program skims through the given texts to locate a word of appropriate structure to follow the word that has already appeared. These occasional pauses, which last no more than a few seconds, add dramatic effect for the viewer, who has no way of predicting the length or content of a line or stanza. *Golden Lion* is a crucial text toward understanding Cayley's project because it uses as its base text a prose work by the Chinese Buddhist monk Fazang (AD 643–712) that refers to "Indra's Net," which inspired the name for Cayley's ongoing presentations. Fazang's image of a lion becomes a metaphor for Cayley's expressive intentions:

> the lion is the whole
> each sensible organ of the lion is a separate part
> which shares the content of the whole
> complementary but separate
> combining to make the lion
> distinct and integral.

Cayley describes *Golden Lion* as a "demonstration of interpenetration and mutual identification" between his poem and Fazang's essay, a description that can be applied to the associations and relationships he builds in all his prehistoric works (email 1996). Furthermore, the hologogrammatic transformation in *Golden Lion* contains more than five hundred words, and short phrases are used instead of single words as the alphabetic skeleton of the passages; thus the syntax is more fractured than in previous programs. The asyntactic jumps are challenging but can be managed by a viewer who does not rely on punctuation or line breaks. It is tempting to read the messages transmitted in Cayley's poems as a type of commentary on themselves. Because of the acknowledgment of the influence of Fazang's essay, what emerges from the collocation not only conveys a statement by one text regarding another but also relates to the Indra's Net project on the whole. In *Book Unbound* the language addresses the relationship between books and burgeoning forms of

electronic writing and the rise of the Internet (which was blooming into the WWW at this time) and their association with human forms in culture. In some ways *Book Unbound* is the most enigmatic of Cayley's works yet, as the given text (a piece of prose by the author) is hidden, and the capability to immediately influence the collocation is not apparent. Instead, *Book Unbound* invites viewers to directly influence the dynamics of the work using an approach that varies from the methods in earlier works. Here, writes Cayley, "readers can alter the work itself (irreversibly), collecting generated lines or phrases for themselves and adding them to the hidden given text so that eventually their selections come to dominate the generative process. The reader's copy may then reach a state of chaotic stability, strangely attracted to one particular modulated reading of its original seed text" ("Machine Modulated Poetry by Potential Literary Outlaws"). Whether or not the viewer opts to participate in the text, discernible patterns do not present themselves on the level of the line or of the passages individually or as a whole, even though words are frequently repeated.

32. The following arrangement is used: the first of four lines shows the month, the second signifies the date; the current time can be told by interpreting the two lower lines, which show the hour and minute. If a zero is needed, a word without a bold letter is inserted. Emboldening the letters on the clock figure itself represents the seconds of a minute, so that every five seconds a different letter around the circular display is highlighted.

33. These are the programs credited on the title page. However, none of the specialized features of Storyspace, such as the tree map, chart view, or Storyspace map, are overtly present.

34. Later the inception of the WWW, sophisticated search engines (which are in fact multimedia hypertexts), and interconnected databases began to display intimations of what such a textual system might be like, but these only partially appeased concerns raised in Nelson's dilemma. In terms of creating under different rules, or in creating work using sophisticated mediation on the Internet, there are a variety of technical and cultural limitations to the implementation of his objective (which may in time diminish if this network grows, remains stable, and becomes part of everyone's everyday life).

35. As noted earlier (see note 10 of the introduction), *ergodic* is a term cultivated by Aarseth in *Cybertext: Perspectives on Ergodic Literature,* to begin to establish criteria for the level of interactivity in any text. Aarseth defines textual presentations where the reader/viewer makes selective movements to effectuate a semiotic sequence, where "nontrivial effort is required to allow the reader to traverse the text," as ergodic literature (1); see chap. 5.

36. For instance, Cayley, on the *Indra's Net* theory page (see <http://www.shadoof.net/in/intheory.html>), argues that one of the principles guiding his work "is a belief in the distinctive qualities and special value of a literary experience characterized by silent reading. In the new culture of cyberspace this experience must strive for self-preservation in the face of a multimedia assault which seems some-

times to claim that literature is next to nothing without its loud and colourful ornamentation."

Chapter 4

1. WELL is an acronym for "Whole Earth 'Lectronic Link"; the service, based in Northern California, was started by Stewart Brand and Larry Brilliant in 1985. By using a modem and telephone line a user would dial up and connect to a server that functioned as the virtual bulletin board on which members could communicate. By 1988 more than three thousand online electronic services were available (Kelly 75). These channels provided a means by which users could dial up with a modem, post and download files, and partake in discussions. A wide range of BBS literary resources became available, both through major service providers (e.g., Prodigy, America Online) and through many fringe or alternative initiatives.

2. Usenet ("the User's Network") is a free online indexing system organized into specific "news groups"; more information about this system is presented below.

3. Frank Popper's *Art of the Electronic Age* also cites Galloway and Rabinowitz as producers of a 1977 "interactive composite-image satellite dance performance" (136). The Electronic Café project, according to Popper, united six "culturally distinct" communities in a "telecommunications image bank and data-base network" that used electronic writing tablets, computers, printers, video, and other devices in a way that allowed users to perform and write poems in "participatory and public 'Art communication' " events (137).

4. ISDN is an acronym for "Integrated Services Data Network," a broadband system that uses fiber-optic telecommunications to integrate telephone, interactive media, fax, video conferencing, and data-transfer services.

5. As Bernstein writes in the preface of Kuszai's book, the listserv was "private" in that one could only subscribe if he or she knew about it; it was not listed in any of the public listserv indexes (6). In the list's early years postings were not moderated; every message sent was circulated without review. Later, after incidents described by Kuszai and other virtual confrontations, transmissions were reviewed by a moderator.

6. In the late 1990s Stefans's masterful animated WWW poem *the dreamlife of letters* was the result of his participation in a POETICS roundtable.

7. For a broader history and discussion of the significance of this group, I recommend Kuszai's presentation and analysis. Also worth noting is Robert Creeley's *Day Book of a Virtual Poet* (New York: Spuyten Duyvil, 1998), which chronicles discussions by another Buffalo-based listerv, City Honors Online Writing Program Discussion List, prompted and moderated by Creeley from 1996 to 1998.

8. Included among the highly cultivated resources available to readers of ALT-X more than a decade later are Alt-X Press (e-book downloads, print-on-demand), Alt-X Audio (streaming audio, mp3 concept albums), Hyper X (net art), *The Elec-*

tronic Book Review, Black Ice Books, and other virtual imprints (see <http://www.altx.com> [accessed March 10, 2005]).

9. In an overview of the *Hypertext Hotel* project titled "Don't let you push! Don't pull!" Heiko Idensen writes that the virtual building serves as "a living social structure, where the most diverse 'stories' intersect in a much-used spatial model for a data-architecture in literature, electronic texts and network projects." Using a design that embodies the structure of a building (seen before in Anderson's *Puppet Motel*), in Idensen's view, "permits an extensive networking of the most varied materials, media and dramatic processes, encapsulation and layering and besides this also corresponds to the theoretical model of hypertextual writing as a writing in places."

10. Weblogs, or blogs, are Web sites maintained by one person or a small group, usually about one distinct subject, which are constantly updated and (when sophisticated) attract repeat visitors. Blogs make extensive use of hyperlinks as a means to attribute, recognize, and otherwise acquire information.

11. Several excerpts were published in magazines, and some as chapbooks, including *The Idea of Switzerland* (We Press, 2001), *LambdaMOO—Sessions* (Writer's Forum, 2004); see also my book-length manuscript "Whereis Mineral" (2002).

12. Another example of such effects, although less ornate than the MOO documents, is the opening chapter of Stefans's *Fashionable Noise,* "potentially suitable for running in a loop," which is a transcript of an online ICQ (Internet chat) session between Stefans and Darren Wershler-Henry.

13. The concept of a poetry "slam" was developed in the 1980s; slams are competitions—usually but not always held in bars or nightclubs—between poets who are judged by members of the audience, who score each performer.

14. Although the *EPC* remains an important resource for contemporary avant-garde poetry, the WWW site of the Electronic Literature Organization (ELO) <http://www.eliterature.org) is now a more comprehensive resource for information regarding electronic literature and links to publications of all sorts; the site also houses an extensive directory of digital authors (see <http://directory.eliterature.org>).

15. A decade later the archive has grown to include seventy titles (see <http://capa.conncoll.edu/>).

16. At first, nothing more than poems and translations were presented, though by now its WWW site—which houses works by seven poets—contains all kinds of multimedia resources (video, sound, image); see <http://www.ibiblio.org/ipa/> (accessed March 9, 2005).

17. Though the Internet made accessing Usenet easy, the system was not dependent on it. As Ed Krol writes in *The Whole Internet User's Guide and Catalog,* Usenet is a "set of voluntary rules for passing and maintaining news groups" (129). A server collected news from a number of sources and held it in a database that could be accessed directly (by dial-up modem) without connecting to the Internet.

18. UNIX was an online operating system that was used to read email, edit online documents, and otherwise access the Internet.

19. Someone interested in reading poems on America Online had to enter a key-

word (PDA), select "Palmtop Paperbacks," select "Ezine libraries," select "Writing," and then select "More Writing," a process that was not very efficient!

20. By the late 1990s, several bulletin boards were still active, including alt.arts.poetry.comments, alt.arts.poetry.urban, alt.language.urdu.poetry, alt.lesbian.feminist.poetry, alt.teens.poetry.and.stuff, christnet.poetry, dfn.rec.poetry, fidonet.poetry_workshop, scruz.poetry, ucd.rec.poetry, fj.rec.poems, rec.arts.poems, tw.bbs.literal.poem, alt.language.poetry.pure-silk, alt.poetry.doggerel, alt.centipede, and alt.ygdrasil. In following years, as BBS became easier to set up on the WWW, personal BBS, usually sites set up by users to post their own poetry, became popular but are usually very small in scale. Webrings, groups (clubs) hosted by Yahoo! and other service providers, and blogs have been used effectively by groups to circulate and discuss poetry (digital and analog).

21. I presume that other poetry publications were circulated via email prior to this point, though I am not aware of any; the three journals introduced here are the first I received in such a form.

22. Authors whose work was published in the various editions of *We Magazine Issue 17* were Don Byrd, Lee Ann Brown, Robert Kelly, Belle Gironda, Steven Taylor, Stacey Sollfrey, Julio Cortázar, Charlie Mehrhoff, Eric Curkendall, India Hixon, Tony D'Arpino, Katie Yates, Pierre Joris, R. Kimm, Beth Borrus, Jean Vengua Gier, Nancy Dunlop, Michael Weaver, Stephen Cope, and Joachim Frank.

23. Between 1993 and 1995 five editions of *RIF/T* appeared, featuring poetry and translations by more than forty authors, including mIEKAL aND, Lydia Gil, Michael Joyce, Lisa Jarnot, Richard Kostelanetz, and Katie Yates. Articles about, and reviews of, numerous books of contemporary poetry from across the cultural spectrum appeared in the journal's "Chapbook Extensions" series, an active addendum to the publication that also included volumes of poetry. A listserv was also used to issue publications such as *Real Poetik,* produced by poet Sal Salasin beginning in 1994, which publishes lively and witty poems in English. From both of these publications, poems from a wide range of geographic locations and with variant aesthetic approaches regularly arrived, with brief introductions, into a subscriber's email account. While the quality of work circulated via *Real Poetik* was less consistent than *RIF/T,* it was a novel and worthwhile approach to organizing a literary publication in which the technology clearly accelerated the editorial exchange and process.

Grist, an electronic journal produced by John Fowler (that revived online an earlier poetry arts project), was launched as an Internet publication in 1993. The journal was available via email subscription, or readers could use Internet file transfer protocol (FTP) procedures to download contents from the University of Michigan's etext archive, or they could access it by using the other networks to which it was posted (Compuserve, Fidonet, other BBS sites). An eclectic journal dedicated to "electronic network poetry, art and culture," seven editions of *Grist* appeared between 1993 and 1995. Despite its elementary presentation and the absence of technologically innovative work, the journal was remarkable in presentation of advanced and innovative works by multiple generations of writers in each issue. Over

the course of its brief existence *Grist* featured such writers as Carol Bergé, Tuli Kupferberg, Ron Silliman, Jerome Rothenberg, Anne Tardos, and Charles O. Hartman. Fowler's electronic inclinations grew, with the development of the WWW, to encompass a larger archive of historical and contemporary works on a site called *Grist Online,* which contained several electronic chapbooks and served as portal to several other electronic literary endeavors, particularly two related resources, *Light & Dust Anthology of Poetry* and *Cyanobacteria,* sites that also collected works by a range of authors past and present and grew to be repositories for more advanced forms, including visual and animated works.

Just as the *Electronic Poetry Center* (see below) was a direct by-product of *RIF/T, Grist* commenced as a journal that was committed to bringing out new material and gradually evolved to become a useful WWW resource (though it was formally taken offline in July 2002).

24. Though plenty of traditionally styled poetry was presented in these electronic periodicals, a wilder and more playful tone was established in others. For instance, Wolfgang Hink's "A Guide to Literature on the Internet" reports that *The Morpo Review* promoted its "unhinged poetry" with the description, "How about Sonnets to Captain Kangaroo, free-verse ruminations comparing plastic lawn ornaments to _Love Boat_ or nearly anything with cows in it. No, not cute, Smurfy little 'ha ha' ditties—back reality into a corner and snarl! Some good examples are 'Oatmeal' by Galway Kinnell, 'A Supermarket in California' by Allen Ginsberg, or the 6th section of Wallace Stevens's 'Six Significant Landscapes.' " Beginning in 1994, I was editor of forty-five editions of *Descriptions of an Imaginary Universe* (*DIU*). *DIU* was initially also circulated as an email newsletter that was instantaneously archived on the Internet (at the *Electronic Poetry Center* and other locations) and was later issued via subscription to a listserv based at the University at Albany. *DIU* is discussed at some length in the introduction to Benjamin Friedlander's *Simulcast: Four Experiments in Criticism,* in which Friedlander presents a historical account of the journal. He writes, "*DIU*'s most *useful* contribution to Internet culture may have been its initiation of an uncertain, even hostile readership of poets into the pleasures and possibilities of the 'virtual,' something the journal accomplished by exaggerating the Internet's most often noted qualities (anonymity; self-creation of identity and community; erasure of geographic distance; occlusion of gender; ethnic and age differences) within a quasi-fictional frame that at once highlighted and rendered safe the alienating strangeness of the medium itself" (40). Academic demands were the primary reason for the journal's end, though the rise of the WWW—and the expectations that one should use it as a publishing tool—also contributed to its cessation. While the basic editorial mode (featuring anonymous texts) could be used in WWW publications, the process of reformatting information that had originated via Gopher or email into HTML was not something I was interested in doing with this particular project.

25. *EXPERIODDI(CYBER)CIST* (ed. Jake Berry) was the electronic version of the printed journal *EXPERIODDICIST;* both were dedicated to avant-garde expres-

sion and published progressive, expansive poetry (eighteen editions were produced between 1993 and 1997). *Inter\face* (ed. Ben Henry) produced thirteen electronic issues between 1993 and 1998. *Ygdrasil* (ed. Klaus Gerken) began as a BBS publication, was one of the first publications to produce an HTML version in April 1995, and is still actively publishing on the WWW a decade later.

26. Shaw's statement in *Theories and Documents of Contemporary Art* reports that the New York text, written by Dirk Groeneveld, comprised eight distinct fictional story lines that were monologues by Ed Koch, Frank Lloyd Wright, Donald Trump, Noah Webster, a cabbie, a tour guide, a conman, and an ambassador (488). The Amsterdam text was created from archival documents concerning historical events that occurred in the city between the fifteenth and nineteenth centuries, located on the screen in the areas of the cities in which they had happened (489). For readers interested in a more thorough consideration and critique of this work as a hypertext, see Joyce's essay "What Happens as We Go? Hypertext Contour, Interactive Cinema, Virtual Reality, and the Interstitial Arts of Jeffrey Shaw and Grahame Weinbren," in *Of Two Minds* (199–218).

27. This group consisted of Sandy Baldwin, Belle Gironda, Eric Douglas, and myself. Our collaborations appeared in the Internet journals *RIF/T, Grist, Inter\face,* the *Kenning* audio edition and the *mmmzzz . . .* sound poetry CDs, *The Little Magazine,* vol. 21 CD-ROM, and my e-book *Selections 2.0*.

28. In a March 2005 email Jim Andrews cites Gregory Whitehead, Helen Thorington, Susan Stone, and Douglas Kahn as writers who enlivened their voices when recording and whose "work seemed to me often simply more exciting than 'naive' approaches to recorded sound" (email 2005). Andrews calls this a "poetry of recorded sound," adding that "these are not poemy poems, but, again, the engagement with language is intense"; he notes that Whitehead now has a WWW site (<http://gregorywhitehead.com>) and that Thorington produced the *New American Radio* series in the 1980s and 1990s (which commissioned audio writers to produce radio art that was aired on National Public Radio and internationally) and has since then produced a WWW site called *Turbulence* <http://turbulence.org>, which commissions "net.artists" to produce "net.art" (e.g., Andrews's *Nio* was commissioned by *Turbulence*) (email 2005).

29. For Amirkhanian's description of the compositional process of "SNIRO" see Kostelanetz, *Text-Sound Texts* (191).

30. In addition to David Antin's installation "The Conversationalist" (1969–70, documented in the *SOFTWARE* exhibition catalog), in which a viewer's response to a given recording is recorded and played back amidst other recordings (43), I know that speech recognition software has been used to create at least two forms of multimedia art, Carl Geiger's 1999 video collaboration with poet Georgia Popoff, "Cameo Benign," and Tony Kemplen's *Half Muffled Clappers* (which used a recording of Princess Diana's funeral as verbal source), published in *Riding the Meridian's* "Sound/Text Hypertext Text/Text" issue (<http://www.heelstone.com/meridian/kemplen> [accessed March 10, 2005).

31. Shockwave is the piece of software used to create this style of text.

32. From a very early stage Loss Pequeño Glazier organized a series of his audio works on his *Electronic Poetry Center* author page, and another early WWW site, *Spoken Word Heard Jukebox,* enabled viewers to download selections from a "Poetry Juke Box" (not streaming audio in real time).

Chapter 5

1. Perloff's assessment is accurate. As computers became more and more visible, many arguments were made against technology-dependent poetry. When computer-based literary publications began to appear on the Internet and CD-ROM in the early to mid-1990s, many writers resisted using such techniques because of their limited accessibility to readers. Suspicion and charges of elitism were leveled at digitally produced works. Some critics argued that the technology reduced poetry to dehumanized bits of data. Others saw it as too exclusive and impermanent, as computer platforms were neither standardized nor ubiquitous. Each of these criticisms holds merit: writers, artists, and publishers working with high technology must be aware of hegemonic issues surrounding computers. For some, these issues may become complications; for others the matter is directly addressed in and by the work produced. Digital technology, for better or worse, made a great impact on industrialized nations. One can protest this by refusing to engage with it. Others will, and do, see issues of access and durability as historically and geographically contingent and react by using the media for poetic ends that challenge, question, take advantage of, and in some cases subvert the machinery's initial purposes. Undoubtedly, certain types of hardware and software technology are cultivated for destructive and exploitative purposes, but these forces have not exerted an overwhelming takeover of literature or poetry, and it is unlikely that this will happen to any extreme degree. Using computers creatively, altering the way we generally use the machines and programs, is not a large step toward balancing out cultural hegemony. Nonetheless, how can one regard the addition of humanist content to networks as an offensive act, especially if that content seeks to transform the way people see themselves and the world around them? Authors and editors of literary publications use computers creatively rather than to compute and support the growth of capital, as so much technological "innovation" does. To use computers creatively is to make a conscious effort to demonstrate that computers can be used for purposes beyond data processing and storage. Digital poems, in part, are devices—forms of expression—that are capable of renewing and severing both the customary space occupied by computers and the traditional customs of literature.

2. In 1995 the process of viewing works on home computers was hampered by the slow transmission of text—typically a modem connected to a telephone line. Now cable modems use networks that deliver television and have radically increased the transmission speed for multimedia works.

3. I have assembled an index of works available on the Internet, including those

discussed below, on the Web site *A Selected Bibliography of Online Cyberpoetry* <http://web.njit.edu/~funkhous/select.html>.

4. Many of Glazier's works from this era are available through his author page at the *Electronic Poetry Center*—see <http://epc.buffalo.edu/authors/glazier>.

5. This is a commendable idea, but this particular project is not regularly updated.

6. In 2001 *windsound* received the Electronic Literature Organization's award for poetry, which included $10,000 in prize money. Cayley's *Indra's Net* contains an index of links to all Cayley's work; see <http://www.shadoof.net/in>.

7. According to Cayley's WWW site, *windsound* is based on original texts by Cayley, along with his translation of a Sung period lyric, "Cadence: Like a Dream," by Qin Guan (1049–1100).

8. The following list of text generators available for download was compiled from the WWW sites *TextWorx Toolshed* (which went offline in 2005) and *Computer Generated Writing* <http://www.evolutionzine.com/kulturezone/c-g.writing/index_body.html>: Macintosh programs: Anagrams 1.4, Chaos Poetry Generator, Chef, Decide, Deconstructor, Electric Poet, Foggy, Haiku Master, Hexon Exon, Imaginame 1.0.1, Janusnode 1.08, Kant Generator Pro 1.3.1, MacProse, MacTRAVESTY, Make Some Poems, MBA Phrase Generator, McPoet, Merzpoetry, Neologisms Dictionary, PataLiterator, Robo Riter, Tafkapulator, TextMangler, Trakl'Bigi. Dos Programs: Babble, Cognate, Diastext, Diastic Macro for MS Word, Dada Poem Generator, Random Verse Lab, Mark V. Chaney 1.0, ParaMind, Translate 1.0. Unix Programs: Chef, Bable. World Wide Web programs: Decoder-a-go-go, Swedish Chef, Trakl'Bigi, Surrealist Compliment Generator, Exquisite Cadavulator, Colin, Postmodern Thesis Generator, Rant, Abuse-a-tron, hAIku v.1.0, daily nonsense, Surrealist games, BABLE, CatchPhrase, Lexicon-Oracle.

9. The WWW site first went online in spring 1996. See <http://userpage.fu-berlin.de/~cantsin/index.cgi> (accessed March 21, 2005).

10. Certainly there are many more contemporary works that could be used as examples. In 2006, for example, Wilton Azevedo released a remarkable interactive video piece, *The Poesia Café,* which he created with the programs After Effects (Adobe), Macromedia Director MX, and Audition (Adobe). Jason Nelson has composed numerous dynamic poems (see, e.g., http://www.heliozoa.com/). An enormous archive of audio works is being constructed at *PennSound,* some of which involves digitally manipulated poetry (see <http://www.writing.upenn.edu/pennsound/>). Leevi Lehto, a Finnish poet-programmer, has created a "Google Poetry Generator" that makes poems from Internet search string titles <http://www.leevilehto.net/google/google.asp>, and K. Silem Mohammad's book *Deer Head Nation* (San Diego: Tougher Disguises, 2003) also uses search strings to make poetry. This is but a partial list of additional innovative contemporary works.

11. Beyond the type of aesthetic fusion, or hybridized textuality, Strickland attempts, many book artists and designers have shifted their orientation from handpress production to software. In some cases the shift is due to convenience, but it

can only occur because the capabilities of graphical technology have become so refined. Digitally rendered texts permit precise and elegant arrangements, which are not so different from their historical antecedents. Documents are coded and processed on a manual but premechanical level, using software and keyboards instead of a printing press.

12. A few of the original concrete poets eventually experimented with computers, and some became significantly involved with the tool (e.g., E. A. de Souza and A. de Campos).

13. The site is online at <http://web.njit.edu/~funkhous/web/inside.HTML>. Another hypertext project I produced, David Rothenberg's poem "The Zone," was built using the same method.

14. Blaser also interpolates or classifies this as a "commotion" of the invisible and visible (306).

15. The "real dream" or pursuit of hypertext has always been, as Nelson wrote in *Computer Lib/Dream Machines,* "for 'everything' to be in the hypertext" (45).

16. In my own experience as an author and viewer of digital poetry I have experienced transcendence only at events where such poems were being performed: with Purkinge (Saratoga, NY, 1994), Rosenberg (London 1997), and Cayley (Morgantown, WV, 2003).

17. *Wiki,* Hawaiian for "quick," is a type of server software that allows multiple users to create and edit WWW page content using any WWW browser.

18. This distinction is necessary, for instance, because the effort required to click on a link in a typical WWW production would be considered trivial in most cases; thus, most WWW pages are no more ergodic than an ordinary novel.

19. For instance in Aarseth's scheme, *scriptons* is a term that describes strings of text as they appear to a reader, *textons* describes the strings as they exist in the text, and *traversal function* is the mechanism by which scriptons are revealed or generated from textons and presented to the user (62–65). The seven variables of Aarseth's typology (dynamics, determinability, transiency, perspective, access, linking, and user functions) create a multidimensional space of 576 media positions from which a cybertext profile can be charted and any text's qualities quantified. Analyzing these elements within texts in all media, he provides a cross- or transmedia vocabulary, an apparatus by which to discuss and analyze all forms of textuality in a neotextual world (65). Areas outlined within Aarseth's function-oriented perspective are (1) dynamics: the changing of the textons to its scriptons (the way textons change to create different scriptons); (2) determinability: the predictability of the text, whether it is randomized or if it is constant; (3) transiency: the pace at which the text moves (i.e., the rate of the appearance of scriptons); (4) perspective: the involvement the reader has with the text (personal or impersonal); (5) access: random access means all scriptons of the text are accessible at all times; if there are hidden parts that a viewer must work to discover, access is controlled; (6) linking: the text's most direct association with other parts of the text, which can be explicit, conditional, or nonexis-

tent; (7) user functions address subjective aspects of a text, with explorative, configurative, interpretive, and textonic functions (65).

20. A profound acknowledgment of the potentials for cybertext is recognized in the gathering of a document coedited by Glazier and Cayley entitled *Ergodic Poetry: A Special Section of the Cybertext Yearbook 2002* (Jyväkylä: University of Jyväkylä, 2003). Contributions to this volume include Markku Eskelinen and Raine Koskimaa ("Introduction: Towards Ergodic Maturity"); Loss Pequeño Glazier and John Cayley ("Diaductory Intrologue"); Bruce Andrews ("Electronic Poetics"); Janez Strehovec ("Attitudes on the Move—On the Perception of Digital Poetry Objects"); Philippe Bootz ("Hypertext Solution/Dissolution"); Jim Rosenberg ("Questions about the Second Move"); Lori Emerson ("Digital Poetry as Reflexive Embodiment"); Sandy Baldwin ("Process Window: Code Works, Code Aesthetics, Code Poetics"); Roberto Simanowski ("Aleatoric as Enlightenment: Simon Biggs' Deconstruction of a Kafka Text"); Giselle Beiguelman ("Liquid_Poetry.br"); Maria Damon ("Electronic Poetics Assay: Diaspora, Silliness and ?Gender?"); Talan Memmott ("On Herminutia: Digital Rhetoric and Network Phenomenology"); Eduardo Kac ("Biopoetry"); William Gillespie ("Drugs, Machines, and Friendships: Cybertext, Collaboration, and the Beatles, Take 10 [Norwegian Round Table Mix]"); Nick Montfort ("The Coding and Execution of the Author"); Adrian Miles ("Softvideography"); Ragnhild Tronstad ("A Matter of Insignificance: The Mud Puzzle Quest as Seductive Discourse"); Cynthia Haynes ("Arctic Virgins: Élekcriture and the Semiotics of Circumpolar Iconographé").

21. The event, held in Morgantown, West Virginia, April 2003 (co-organized by Loss Pequeño Glazier and Sandy Baldwin), is discussed further at the end of this chapter.

22. Intermedia is a concept formulated and defined in Dick Higgins's book *Horizons:* "When two or more discrete media are conceptually fused, they become intermedia. They differ from mixed media (q.v.) in being inseparable in the essence of an artwork" (138). Incidentally, an "Intermedia Chart" drawn by Higgins provides a useful map for what has been described as polyartistry, an expressive tendency that unquestionably grew in the twentieth century. Higgins's chart, published in *Poems for the Millennium,* indicates how crossover between forms has created a need to envision pluralistic models of text rather than the adaptation of a particular historical form. Each "movement" is given its own area (in its own circle contained within the circle of "Intermedia") (428). Higgins charts concrete poetry, poesia visiva, visual novels, object poems, sound poetries, fluxus (objects, cinema, and performance), mail art, conceptual art, action music, object music, graphic music notations, happenings, science art, dance theater, performance art (428). The chart is not totalizing but suggestive; one does not get the sense that Higgins is imposing a fixed plurality in the designations that appear on the chart, given the inclusion of three areas that contain not words but question marks. As an illustration of the viewpoints I have put forth in this book, a plane of the chart that could be drawn

between "concrete poetry" and "science art," which passes through "sound poetries," "poesia visiva" (*poesia visiva* is a term used to designate a group of Italian artists who were involved with the fluxus movement), and fields unknown ("?"), would easily incorporate each of the foremost areas of digital poetry demonstrated at E-Poetry 2003 (typography, e-vispo, text, programming, codework, sound poetry).

23. At present these works are no longer available on the WWW, providing a close-to-home example of the ephemeral conditions of digital poetry (and electronic texts in general). I am working with George Taylor to reconstruct "Moby-Dick"; see <http://web.njit.edu/~funkhous/moby-dick/index.php>.

24. The words in the original acrostics stem from a lecture about *Moby Dick* and readings of the novel by students at the conference "Reading for the New Millennium: A Global Dialogue on American Literature and Culture in a Time of Change" (Peking University, Beijing, China), 2001.

25. It should be noted that as early as 1996, W. W. Norton began to produce CD-ROM anthologies of classical poetry but has not to date published anything that could be considered contemporary digital poetry.

Appendix A

1. Though the original version of the poem was not made using computer graphics software, in "About Lionel" Jim Andrews reports that in the early 1970s Kearns did a film version of the piece and later a HyperCard version; Andrews also reports that Kearns had the image registered as a trademark. Huth reports, in "On 'On Lionel Kearns,' Jim Andrews, and Comsimplexcity," that Andrews's work inscribes "an amazing psychedelic re-presentation of the original [version of "Birth of God"]. The film is raw and pulsates with black and white before adding some color. As images flash on and off, white zeros become black ones. The effect is so intense that Andrews warns it 'Could induce epileptic seizures.' The film also includes sound."

2. Joyce and Bolter make frequent use of topographical analogies and models to describe methods whereby visual images can be used to read through a text (rather than random, unknown, or preconfigured linear sequence). This model reflects their interest in "spatially realized topics," where a viewer can use a type of digital flowchart to see how parts of the text are interconnected (Bolter, 1st ed. 25). "Contour," Joyce writes in *Of Two Minds,* "is one expression of the perceptible form of a constantly changing text, made by any of its readers or writers at a given point in its reading or writing" (214). Storyspace, a hypertext software program codeveloped by Bolter, Joyce, and others was built with the understanding of "the mind as a web of verbal and visual elements in conceptual space" (207).

3. A related work by Vallias, "PRTHVI," features a similar method to portray a form of verse found in Indian epic poetry.

4. The best collection of scores that reflect what I am referring to here is *Nota-*

tions, compiled by John Cage and Alison Knowles (New York: Something Else Press, 1969).

Appendix B

1. In "Holopoetry" Kac both builds a theoretical framework for his experiments and catalogs the designs and motivations behind all of his works, including several collaborations. Kostelanetz discusses his holographic works in the volume *WORDWORKS.*

2. Kostelanetz reports that he "recently produced on clear film a two-sided print of these pairs of words" (email 2005).

3. See <http://www.videcom.com.br/vcbeng%20moyses.htm> (accessed Aug. 11, 2005).

4. Kostelanetz reports in a 2005 email that this is "mostly because of lack of production invitations. For a while the necessary film was unavailable" (email 2005). Augusto de Campos reports that Moyses's holographic works were "interrupted by lack of financial support and of interest from the artistic institutions" (email 2005).

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