New Media Poetry :

# Poetic Innovation and New Technologies

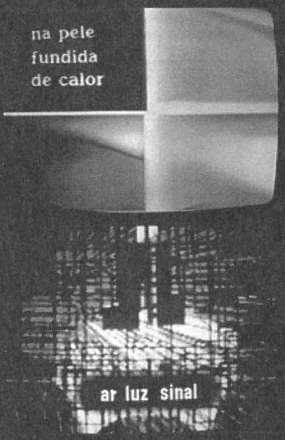
Eduardo Kac, Guest Editor

**Visible Language 30.2**

# INTRODUCTION

This is the first international anthology to document a radically new poetry, one that is impossible to present directly in books and that challenges even the innovations of recent and contemporary experimental poetics. The new media poetry documented here pushes language into dimensions of verbal experience not seen thus far. The work of the poets explained and discussed in this issue takes language beyond the confines of the printed page and explores a new syntax made of linear and non-linear animation, hyperlinks, interactivity, real-time text generation, spatiotemporal discontinuities, self-similarity, synthetic spaces, immateriality, diagrammatic relations, visual tempo, multiple simultaneities, and many other innovative procedures. Due to their immaterial nature, the poems created by the authors in this anthology can only be stored in computer disks, video tapes, and holograms. They can only be read on CRTs and LCDs whether with disks, tapes or via the Internet, and on holograms.

This new media poetry inserts itself in the field of experimental poetics, at the same time that it clearly departs from the formal conquests of other groups or movements in the twentieth century. From the rational and anti-rational approaches of the avant-garde movements of the first half of the century (including futurism, cubism, constructivism, dadaism, and lettrism) to the print-based directions of the second half (including spatialism, concretism, L=A=N=G=U=A=G=E, beat, visual poetry, fluxus, and process-poem), experimental poetics has seen a relentless exploration of the verbal sign in "codexspace", to use a term introduced by John Cayley. The poems discussed in this anthology do not follow this route; instead, collectively they state that 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. The old storage medium created by Gutenberg must now be replaced by floppy and hard disks, CDs, CD-ROMs, DVDs and SuperCDs, magneto-optical disks, tape, and holographic film. Many of the authors included in this anthology also make their works and theoretical writings available on the Internet.

The geographic diversity of this small sample of new media poetry — from Argentina and Brazil, to the United States, and to the Netherlands, France, Portugal and the United Kingdom (via Canada) — is a clear indication that this is an international phenomenon. At the same time, the age range in this anthology, from authors in their 30s to those in their 60s, shows that this is more than a single generation's issue. What this anthology documents is an innovative work that seems to contradict postmodern obituaries of new and nonpastiche manifestations. Technology has undoubtedly changed artistic practices in a profound manner in this century. In most cases, however, what one sees is the impact of technological innovation reflected on traditional forms, as exemplified by the current use of the Internet to publish lines of verse. This anthology, on the other hand, reveals poets that appropriate the new writing tools of our time, and with them give life to new and differentiated poetic forms. The multiplicity of forms here recorded (Rosenberg's simultaneities, Valias' multimedia text, my own holopoetry and digital poetry, Cayley's cybertexts, Bootz's unique readings, Györi's virtuality and Melo e Castro's videopoetry) are complemented by Eric Vos' critical analyses of some of the fundamental princi- ples of the innovative poetics outlined collectively by the authors.

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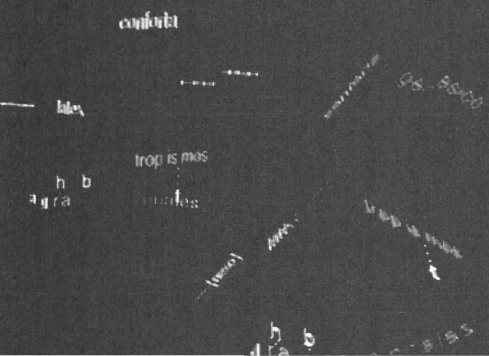
This anthology is by no means comprehensive. A more thorough examination of experimental poetics and technological innovation would have to include pioneers of electronic sound poetry, such as François Dufrêne, Henri Chopin, Bernhard Heidsieck, Brion Gysin and John Giorno, forerunners of digital poetry, such as Aaron Marcus, Erthos Albino de Souza and Raymond Queneau, contemporary polywriters such as Richard Kostelanetz, Jackson Mac Low and Silvestre Pestana, and electronic media artists who straddle between literature and the visual arts, such as Bill Seamon and Jeffrey Shaw.

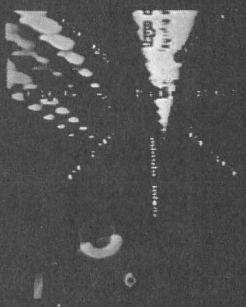
While some of the present forms of distribution of new media poetry are doomed to disappear in the near future, as in the case of the videotape with the imminent arrival of small digital video disks, the revolutionary change in writing and reading strategies new media poetry promotes are likely to have a long lasting presence. The changes at stake are not a matter of writing lyric sonnets with a word-processor instead of a typewriter; the focal point is not a change in writing medium, but the fact that we now also have new accessible reading possibilities. What held back this area of experimentation for over two decades, namely limited processing power, huge size and general unavailability of computers to readers, is no longer an impediment to the development of new media poetry. This international phenomenon started notably in the early '80s and continues with renewed strength today.



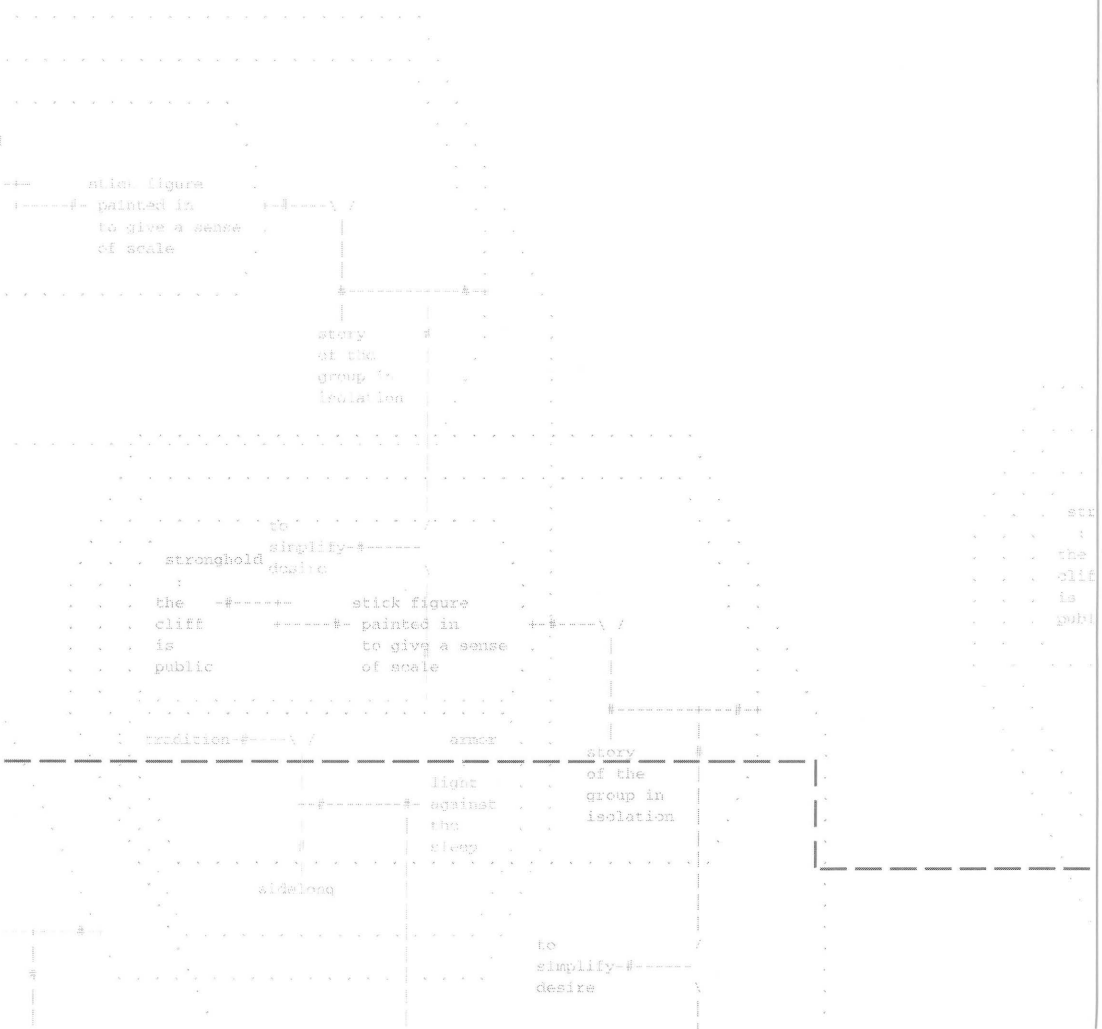

The reader interested in locating the actual poems discussed in this issue will find plenty of references in the texts. In addition, a webliography included at the end provides the reader with links to web pages of direct interest, including some pages authored by anthologized poets which include digital poems available for downloading. I have also edited, in non-commercial CD-ROM format and in limited edition, the first International Anthology of Digital Poetry, which includes works by the poets represented here.

This is only the beginning.

Eduardo Kac



Jim Rosenberg is a poet who has been pursuing experiments with non-linear poetic forms since 1966. His work since approximately 1987 has consisted of interactive poems using Hypercard software on a Macintosh computer; *Intergrams* is published by Eastgate Systems (1994), and *Diffractions through: Thirst weep ransack (frailty) veer tide elegy* is soon to appear.



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*Visible Language* 30.2
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# The Interactive Diagram Sentence: **Hypertext as a Medium of Thought**

Consideration of my work in poetry over more than twenty-five years begins with an analysis of the difficulties of juxtaposition for the poet. A diagram syntax notation provides a method for juxtapositions to be included in larger structures; the accessibility of structural elements in a diagram allows for such constructions as internal relationships and feedback loops. Juxtaposition itself, with no sacrifice of intelligibility, is achieved through an interactive device called a simultaneity. Finally the interactive diagram sentence is explored as a vehicle for hypertext as a medium of thought: this is a truly "native" mode of entirely non-linear thought.

Jim Rosenberg

## Diagrams: a separate channel for syntax

To begin with the elemental, the "structural zero," juxtaposition: the act of simply putting an element on top of another, with no other structural relation between the two elements except that they are brought together, is the most basic structural act, the most fundamental micromaneuver at the heart of all abstraction. But consider the problem of the poet in bringing this about. When a sound is played simultaneously with another sound, the result is a sound. When a painter places a bit of colored space on top of another bit of colored space, the result is a bit of colored space. A mathematician would say that the domains of the composer or visual artist are *closed* with respect to the operation of juxtaposition: the result of juxtaposing two elements from the domain is another element from the domain. But what happens when we juxtapose words? Whether it is done by means of sound — either via simultaneous readings by multiple performers, or by overlaying magnetic or digital media — or visually, the result of juxtaposing words — in the almost palpable physical sense of putting them directly on top of one another — is likely to be sheer *unintelligibility:* one will be lucky to make out any of the words at all. How is the poet to achieve juxtaposition with no sacrifice of intelligibility?

But it gets worse: how can direct juxtapositions of words be *used* in larger structures? It is not hard to work in modes that give up such structures as syntax. One simply does without. Asyntactic poetry is a large and fruitful domain in which to work. On the other hand, giving up all possibility of structure is giving up a great deal indeed. Syntax is at the heart of how we normally structure words. How does one achieve such structuring and yet still have complete freedom to use juxtaposition wherever it is artistically important? How does one designate the *structural role* of a juxtaposition in a larger structure? One could put this question a bit more crudely by asking: What is the part of speech of a juxtaposition? The composer John Cage once criticized the

twelve-tone system as having no zero.[1] One could say that syntax "has no zero": in a sentence every element has its structural role with respect to the syntax diagram, or parse tree; there is no way to have words in a sentence whose syntactical relationship to one another is the *null relationship:* nothing at all except that they are brought together. How can the poet have her cake and eat it too? How can one keep both syntactical null relationships and much more elaborate relationships, in which juxtapositions act as elements?

These are some of the formal problems that have motivated my work going back more than twenty-five years. A method for approaching the second problem — how to incorporate null structures as structural elements — became apparent long before I realized how juxtaposition could actually be implemented. By devising an explicit visual structural vocabulary — separating syntax out into its own channel, so to speak — structural roles could simply be directly indicated. The elements occupying those roles might be words or word clusters or other structural complexes. Thus began a long series of works called *Diagram Poems*.

1 See for instance Cage, John. 1961. "45' For A Speaker." *Silence.* Cambridge, Massachusetts: The MIT Press.

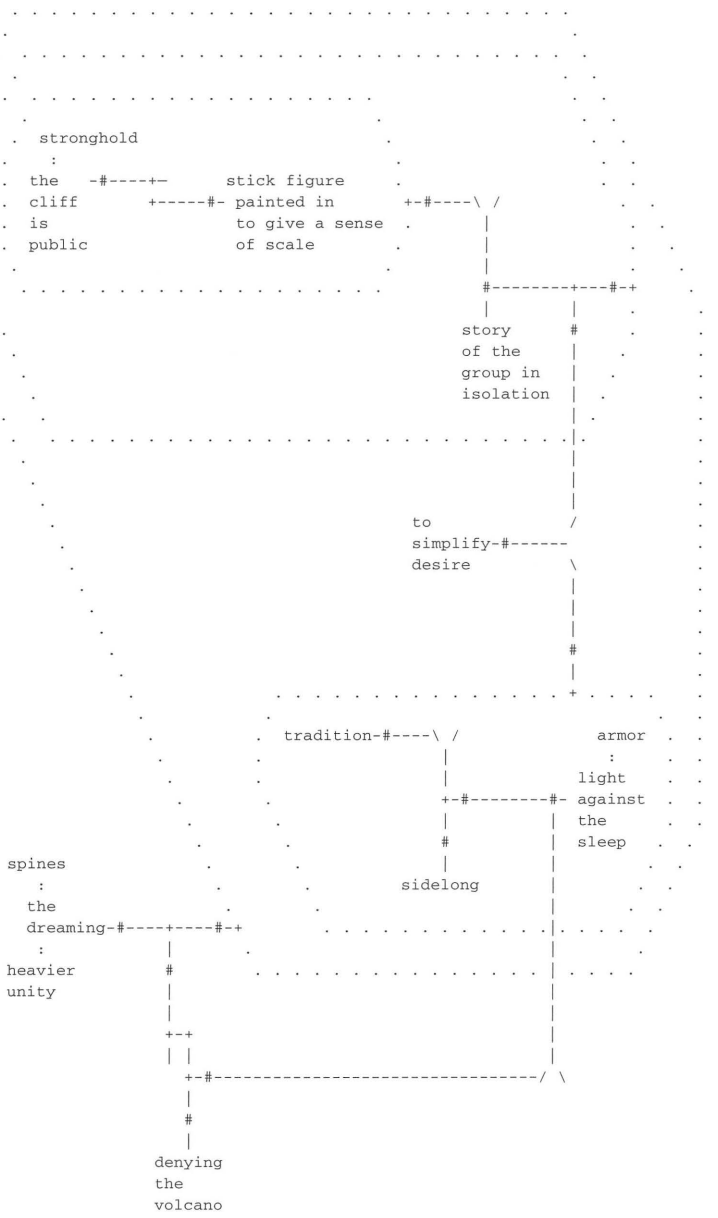



**Figure 1**: A diagram poem from *Diagrams Series 3*

Figure 1 shows a poem from *Diagrams Series 3*.[2] It illustrates many of the facilities provided by the diagram notation in a variety of works spanning a large number of years. The configuration:

```
x -#----+--
        +-----#-y
```

shows a simple modifier relationship where x is modified by y. The configurations:

```
x -#\  /-#-y          x-#---\  /
     |                       |
     |                       |
     |                       |
     #                       #
     |                       |
     z                       y
```

show verb relationships; in the left case above, z acts as the verb relating x and y, in the right case above, y acts as the verb and x acts as the subject.

These relationships can be built up into complexes in two ways: where a "node" in a relationship is a loop of dots, the element participating at that node is the entire contents of the loop; where a node terminates in the graphical part of a relationship, the element at that node is *the act of making* that relationship. A number of interesting things happen when syntax is "externalized" in this way. Syntax came about originally in conjunction with speech, where speaker and listener are constrained by: 1) the requirement that the listener "decode" the message approximately synchronized in real time with the speaker; and 2) the aid of only whatever "temporary storage" the listener has available in short-term memory. One might say that the function of syntax is to pre-code the message with *storage cues* so that the listener will know how to park pieces of the message in short-term memory so that they can be properly assembled in the logical relationships desired by the speaker — all in more or less real time without getting behind the speaker.

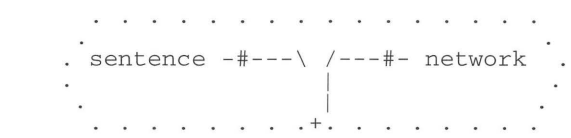
2 Rosenberg, Jim. 1979. *Diagrams Series 3*. Grindstone, Pennsylvania. Excerpts appeared in *Interstate 14*, 1981.

Writing, however, changes the picture completely. Obviously, the real-time constraints are absent: the reader may take as much time as desired, may revisit parts of the message as many times as are necessary and may even browse the message "out of order." In addition, a written document may be said to *provide its own storage*. In contrast to speech, where whatever parts of the message not properly stored in short-term memory by the listener are simply (and irretrievably) *gone*, the written message *persists*: it stores itself, it stores its structure, it stores its own logical relationships.

Secondly, by externalizing syntax, all points and substructures in the message are *accessible* in ways not normally found in speech. That they are accessible to the reader has already been discussed. Some interesting ways they are accessible to the writer are revealed by figure 1. Note the relationship of the phrase "story of the group in isolation" to a larger whole in which it appears. In an externalized graphical syntax, such a relationship is easy to simply *draw*; joining a part with a larger whole in which it participates is as easy as joining a part with a disjoint part. Relationships between a part and a larger whole in which the part occurs are an obvious logical structure that occurs commonly in the world; yet this is difficult to do in conventional syntax. In addition, the fact that relationships may simply be drawn to parts of the message already laid out allows for complex multiple pathways to be established within even small messages; the message may *feed back upon itself*. Feedback, while a ubiquitous structure in nature, is notoriously difficult to deal with. It violates the principle set theorists call "well-foundedness"; it may induce the potential for infinite loops in computer programs. Where feedback is introduced into the way sound elements are combined in an electronic synthesizer the results may be completely unpredictable: all bets are off. Figure 1 also illustrates this concept of feedback inside the sentence: the "highest-level" logical relationship shown in figure 1 relates the configuration at the very bottom, in which "denying the volcano" is a modifier, with a cluster "already" deep within the message: "armor : light against the sleep."

A feedback loop may seem an inimical structure to a programmer, where the threat of an infinite loop is ever present (and indeed the infinite loop stands out as an archetype "cardinal bug" second only in its fearsomeness to an out-and-out crash); one may say that the threat of an infinite loop stands as the fear at the heart of all programming. (Technically, the theorem that one cannot algorithmically determine whether a general computer program will lead to an infinite loop is known as the halting problem and establishes absolute limits on what is computable.) Yet, when the composer induces feedback into synthesized sound structures, the ear can hear it as a single sound; when a graphical feedback loop is established in a visual syntax, the mind can apprehend *the loop as a whole* as a single gestalt. Of course to do so, *time must not be constrained.* It is difficult to see how an aural syntax, subject to real-time constraints, could accommodate feedback loops.

A diagram syntax is notably non-linear. While this is an important point, one must be careful to avoid going too far in pushing non-linearity as a distinction between a diagram syntax and the conventional speech syntax. The essence of syntax is its ability to convey logical relationships across a distance of intervening words; one might say syntax has been our way out of the bind of achieving complex speech structures in the face of the constraint of linear time. Conventional syntax provides a start toward obtaining full non-linearity from an inherently linear channel; a diagram syntax can break free completely to non-linearity without restraint. Non-linearity is freed to extend far down into the fine structure of language — just barely above the word. Or, to put it slightly differently:



## The **i**nteractive **j**uxtaposition

But how to actually achieve juxtaposition of words — to place them literally on top of one another — and sacrifice nothing in the way of intelligibility? Too often we think of words simply as whatever comes out of a word *processor* — or perhaps one should call it a word constrainer, forcing as it does the words into the familiar linear chains (with a nod to non-linearity by allowing hypertext links) and certainly *not* allowing words to be one atop another! A graphics program, on the other hand, allows text objects to be placed on top of one another with complete graphical freedom, but the legibility problem remains. Yet the graphics program gives a clue: juxtaposition combined with intelligibility is achieved (at last) by using interactive software. In a construction I call a *simultaneity*, words are placed in the same location — with all the freedom and fluidity a graphics program allows. At first it appears the words are simply overlaying one another — with no solution at all to the problem of overlay plus legibility. In this state the simultaneity may be called *closed*. The act of *opening* the simultaneity consists of moving the cursor using the mouse to a particular "hot spot" on the screen. When the cursor enters this hot spot, all layers of the simultaneity but one are hidden: the one visible layer can be read unimpeded by its partners in the juxtaposition.

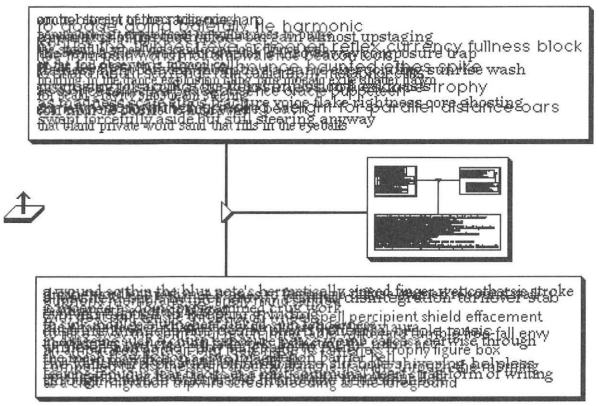



**Figure 2**a.

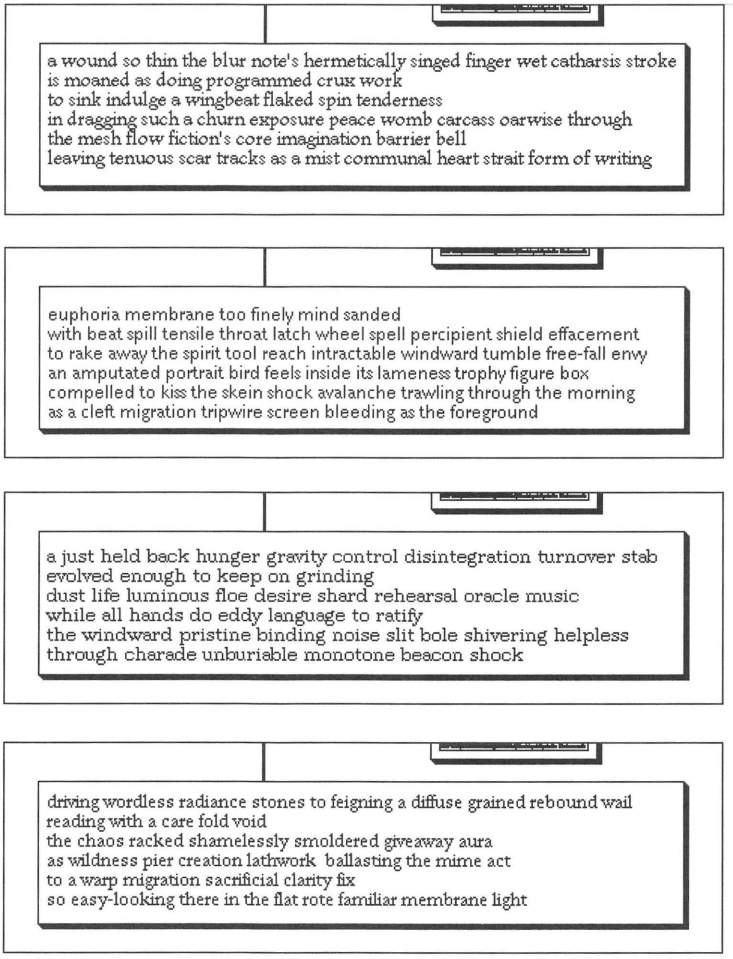



**Figure 2b-2e.**

Figure 2 shows a simultaneity from *Intergrams*.[3] In 2a the simultaneity is closed and all layers are visible; in the detail views 2b-2e the simultaneity is opened showing each layer. (A static illustration cannot convey the *tactile* aspects of causing the different elements to appear by moving the mouse with one's hand; the reader will have to try to imagine this.)

3 Rosenberg, Jim. 1993. *Intergrams*. Watertown, Massachusetts: Eastgate Systems.

## Taking the diagram interactive : **hypertext as a medium of thought**

A diagram is a marvellous instrument for presenting information of great complexity in a small space — to the point that the phrase "Well, you'll have to draw me a diagram" is a stereotype epithet of complaint that something is too complex. There are limitations to diagrams, however. What happens when the space required is not small? How does one manage a diagram comprising *thousands* of elements? Enter hypertext.[4]

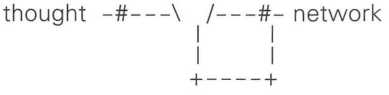
Hypertext is most often thought of as a special kind of computer software — or as the documents produced using that software, but here I would like to consider the idea of hypertext as virtual diagram. In the classical model of hypertext, a document is structured as a network of *nodes* and *links*. The nodes are typically either entire documents, or document regions (known as anchors); a link is a relationship between document places such that clicking on the anchor at the source end automatically takes the user to the destination anchor. If a hypertext is small enough and simple enough, the entire network can be represented by other means than using a computer — on paper, for instance.

Often hypertext begins (alas) at the level of the document; such documents are fully linear and use completely traditional methods for structuring text internally. Using links, associations are built up among places in these documents. The notation of the diagram poems suggests a different possibility: hypertext built up from scratch using very fine-grained word elements, where hypertext is used to carry the infrastructures of language itself, e.g., syntax. One may speak here of *hypertext as medium of thought:* rather than hypertext serving as an association structure for thoughts that are not themselves hypertexts, an individual thought itself is "entirely" hypertext. To use terminology familiar to computer programmers, hypertext becomes a medium in which one thinks "natively."

4 The term "hypertext" was originally coined by Ted Nelson. The literature on hypertext is extensive; for a bibliography see Harpold, Terence, "Hypertext and Hypermedia: A Selected Bibliography," in Berk, Emily and Joseph Devlin, editors. 1991. *The Hypertext / Hypermedia Handbook.* New York: McGraw-Hill. The best single-source introduction to hypertext is probably still Nelson, Theodore H. 1981. *Literary Machines.* Swarthmore, Pennsylvania: T.H. Nelson.

Why should we do this: construct a morphemic hypertext[5] — hypertext taken into the fine structure of language? Why not make do with the syntax we have? Why not leave hypertext structure to relate "conventional" documents, at the level known in the hypertext literature as the lexia?[6]

To answer this question, let me pose a counter-question: How does a single mind apprehend a complex network? It is becoming more and more clear that not only are networks — in the actual physical sense — becoming more and more important in our lives, the network as a metaphor is becoming increasingly important in dealing with a wide range of aspects of living. What does it mean for thought when an individual thought is itself a network? Does it help in understanding the complexities of life's networks around us, containing us, moving us, to "think native" in a mode that is inherently network? Many seek in art a *refuge* from complexity; indeed, many consider simplicity as such a paramount goal for art that it virtually defines artistic purpose. For others, complexity is taken as a given in this life, and art is seen as an aid that can help us *to live with it* rather than fight it or withdraw from it. To understand the network one *becomes* the network. Thought itself is a network, there is no other-than-network:




5 The term "morphemic hypertext" was applied to my work by the hypertext researcher Catherine C. Marshall (private correspondence).

6 The term "lexia" was borrowed from the writings of Barthes by George Landow to refer to a document piece at a hypertext node; see Landow, G. P. 1992. *Hypertext: The Convergence of Contemporary Critical Theory and Technology.* Baltimore, Maryland: Johns Hopkins University Press.

The obstacles in the way of achieving such a hypertext of thought are many. Among them are:

1) Lack of Tools. Most commercially available hypertext systems are not adequate. Although much attention has been paid in the hypertext research community to a variety of structural models other than the standard "node-link" hypertext model,[7] this has borne very little fruit in tools available for the kinds of computers writers are likely to have accessible. Instead, commercially available hypertext software tends to either adhere too rigidly to a node-link model or require the user to build everything "by hand." Typical hypertext structures are or-based, i.e., disjunctive: from lexia L with links X, Y, and Z one may choose X *or* Y *or* Z. Syntax structures are *and-based*, i.e., conjunctive: a sentence with parts X and Y and Z consists of X *and* Y *and* Z.[8] (Consider the classical phrase structure rule:
S -> NP + VP

A sentence can be rewritten as a noun phrase followed by a verb phrase. One does not get to *choose* which of NP and VP to use; they are both there.) This is not to argue against the use of disjunctive structure, or "classical" hypertext links. Rather, the need is for both to be available as an author requires. Typically, commercially available software has no built-in support for conjunctive abstractions at all.

Another problem with available software packages is too rigid an attitude toward *behavior*. Available hypertext systems typically offer only off-the-shelf behaviors that can't be extended by the user. At the other extreme, systems like Hypercard are fully programmable, but don't allow that programmability to be encapsulated in pluggable objects. (For instance, a Hypercard button has no storage containers!)

7 See for instance Marshall, Catherine C., Frank G. Halasz, Russell A. Rogers and William C. Janssen, Jr.. "Aquanet: a hypertext tool to hold your knowledge in place." *Proceedings of Hypertext '91* for a model based on relations; Parunak, H. Van Dyke. "Don't Link Me In: Set Based Hypermedia for Taxonomic Reason- ing." *Proceedings of Hypertext '91* for a model based on sets; and Stotts, P. David, and Richard Furuta. "Petri-net based hypertext: Document structure with browsing semantics." *ACM Trans.Off. Inf.Syst.*, 7:1, for a model based on Petri nets.

8 The concept of conjunctive hypertext was introduced in Rosenberg, Jim. "Navigating Nowhere / Hypertext Infrawhere." *SIGLINK Newsletter* 3:3, http://www.well.com/user/jer/NNHI.html.

2) Reticence to tackle "language itself." There is no gainsaying that the idea of using hypertext to carry the infrastructure of language itself is an extremely radical proposition — one from which many will shrink. One source of objection is the idea that "language itself" is off-limits by virtue of being biologically hard-wired.[9] There are two answers to this: the artistic answer and the engineering answer. For the artistic answer, consider the analogy of dance. No one would dispute that there is a biological basis for how our bodies are put together, for the conformation of bone structure, for the ways that joints work: in short biology places many constraints on how the human body can move. This has not notably abolished the dance. To the contrary: one may say it has *created* the dance: we admire those who can show us what the boundaries are for how the human body can move, who can take us all the way up to those boundaries and perhaps even stretch them. To the degree that syntax is biological, it makes experimentation on the limits of syntactic structure *more* valuable rather than less. For the engineering answer, consider the analogy of computer networks. Again: there is no disputing that neurons are biological objects, and that genetics has a great deal to do with how neurons function individually and how the nervous system functions collectively. This does not diminish the utility or importance of those "externalized nervous systems" we call computer networks. The proposal for hypertext as a medium of thought, for hypertext inside the infrastructure of language, is a proposal for an "externalization" of syntax analogous to the externalization of the nervous system manifested in computer networks.[10] Just as computer networks do not "replace" the biological nervous system, an externalized mechanism of thought does not "replace" syntax; rather it adds to syntax and allows new possibilities.

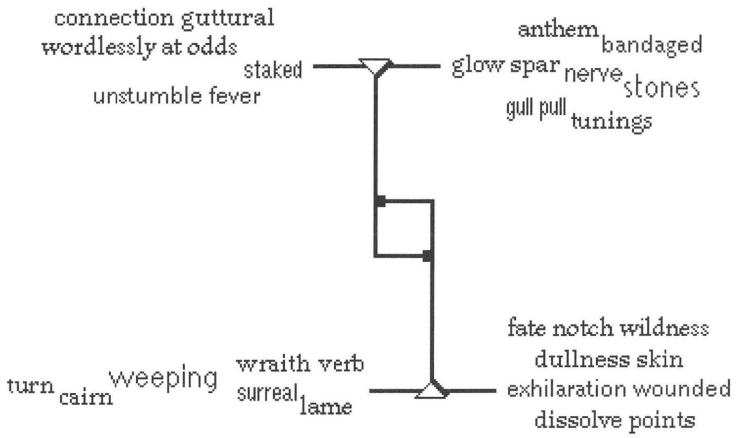
For instance: how do we allow more than one user "inside the sentence"? For a diagram syntax this is almost trivially easy: each user's relationships can be distinctively marked — using color, for instance, or any other form of explicit marking. How is it possible using conventional syntax to construct a "multi-user sentence"? It is exactly in joining

9 For a review of issues pertaining to the biological basis of language see Pinker, Steven. 1994. *The Language Instinct.* New York: William Morrow and Company.

10 Externalization of language is discussed extensively in Donald, Merlin. 1991. *Origins of the Modern Mind.* Cambridge, Massachusetts: Harvard University Press.

multiple users that our biological nervous systems break down and externalized ones show their true value. How does one construct a true multi-user medium of thought? To repeat: a multi-user medium of thought does not mean a multi-user mechanism for bringing together "single-user thoughts" but rather a medium where *the individual thought* can be a multi-user construction. Just as multi-user interactions require an externalization of the nervous system, a true multi-user medium of thought will require an externalization of syntax.

It all interacts:[11]




11 The final figure is a single plane in a simultaneity from Rosenberg, Jim. (In press.) *Diffractions through: Thirst weep ransack (frailty) veer tide elegy.* Watertown, Massa- chusetts: Eastgate Systems.

Philippe Bootz has a Ph.D. in physics from the University of Lille, France. He has been the chairman of the Mots-Voir association since 1984, and the editor of the *alire* review, which publishes electronic writings, since 1989. Since 1994, he is a researcher in communications at the GERICO-CIRCAV center in the University of Letters Lille. He also teaches optics. Between 1978 and 1990 he created visual poems shown to the public in the form of exhibitions and installations (location-poems) which mix the text's space with the reader's physical space. He has realized, since 1979 but mostly since 1986, telematic, computer animated, interactive and unique-reading as well as video poems. He participated in the creation of the L.A.I.R.E. team and of the first review for electronic writings distributed on a digital medium, *alire*. He publishes regularly computer poems and theoretical articles, essentially in the *alire* review and in academic publications.

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# Poetic Machinations

Philippe Bootz

The article first recalls the historical evolution of computer poetry which, from Théo Lutz (1959) to *alire* (1989), evolves from experimentation to cultural entity. The emphasis is placed on the French evolution through its main expressions, which are the A.L.A.M.O., the first telematic review *Art-Access*, the *Les Immatériaux* exhibition and the birth of L.A.I.R.E. The second part more deeply analyzes the differences which have emerged between the two main groups of authors, the A.L.A.M.O. and L.A.I.R.E., a difference of viewpoints, of approaches and of the space given by the authors to computer poetry concerning the arts, the machine, and the text. This progressive differentiation of focus questions approaches which were thought to be unchanging, regarding the notions of text, reader and author. This questioning started with the A.L.A.M.O. and progressed with L.A.I.R.E. Its description and the expression of the answers it proposes requires a new critical approach to the notion of text, more anchored in a communication pattern which has been developing since 1993 and whose present state is summed up in the third part. The article ends by demonstrating that the smooth running of *alire* is the full expression of what these new answers imply.

I had originally promised myself to keep quiet, to nicely put my pen back under the hood, and consequently, to withdraw from it the tiger that never comes to a rest. But I won't, after all. Up to the neck in an adventure that I feel to be mine, I have not been able to bring myself to play the part of the sterilized observer. In this paper I will offer an interpretation of the decade in which poetry lost its near technological virginity. I will rely on a brief history of the main facts before comparing the viewpoints and the ideologies developed by the two principal groups of writers that left their marks on the maturing process: the A.L.A.M.O. (a workshop of mathematics and computer-assisted literature) and L.A.I.R.E. (Lecture, Art, Innovation, Recherche, Écriture). It is not my intent to describe here what these teams produced, for the interested reader will find, throughout the article, all the necessary references to gain access to their production.

## A brief history of time[1]

*From the birth of groups...*

Today there is a general agreement on considering that the first programs of computer texts were developed in 1959, in Stuttgart, by Théo Lutz, and in 1964, in Montreal, by Jean Baudot.[2] These programs were text generators. In France, the situation was to develop along two parallel paths. The organization and energy of this development was unique in Europe. As a matter of fact, it relies on a few elements that are specific to France, some of them being linked to a literary momentum, others to conditions that made the emergence of distribution and the trading of tools easier. Let us briefly review these elements.

The first element is the strong literary tradition in France. One of its essential components, as far as computer poetry is concerned, is the adventure of the "Oulipo." The latter gave birth in 1982 to the A.L.A.M.O., a group of writers and computer scientists[3] "brought together around the project of using, in all possible ways, and without any preliminary bar, the computer in the service of literature."[4] The A.L.A.M.O. headed towards automatic generation of texts and explored several of its aspects, among them poetic forms.[5] Many of its productions were presented at the exhibition *Les Immatériaux* at the

1 Here I raise my hat, even though this is not the subject, to Stephen Hawking.

2 Baudot, Jean. 1964. *La Machine a écrire.* Montréal: Les Editions du Jour

3 The A.L.A.M.O. was started by Simone Balazard, Jean-Pierre Balpe, Marcel Bénabou, Mario Borillo, Michel Bottin, Paul Braffort, Paul Fournel, Pierre Luson and Jacques Roubaud.

4 Preface to issue number 95 of the *Action Poétique* review devoted to the A.L.A.M.O., Avon, 1984.

5 It is essentially Jean-Pierre Balpe who, within the A.L.A.M.O., developed poem generators, for instance the Renga and Haiku programs presented in the exhibition *Les Immatériaux* in 1985 or AMOUR, a love poem generator from 1980. All these generators, and many others, are presented in detail in the following book. Balpe, Jean-Pierre. 1986. *Initiation a la génération de textes en langue maternelle.* Paris: Eyrolles.

Pompidou Center in 1985. The second component, which is more diffuse and yet very real in France, is made up of sound, visual or spatialist poetry, post-dada movements whose authors more or less gravitated around the review *Docks,*[6] which was for a long time edited and produced by Julien Blaine. A whole generation[7] reached the end of the '70s and the beginning of the '80s adhering to some of their elders' ideas, but at the same time missing the central approach, which at that time was only visible in a few exhibitions.[8] This generation was then trying to develop techniques to write texts that took into account time and the presence of the reader (location-poems, network texts). This anticipated the techniques of video texts or of certain categories of computer interactive texts.[9] A large number of these authors, as a matter of fact, have turned to producing their work with the assistance of electronic media (video, computer). It is only recently that these new forms have been drawing more attention with the breakthrough of someone like Patrick Burgaud (a French writer living in the Netherlands) or of Philippe Castellin.

The second element to be taken into account is the impact of the Minitel. This gave birth to an essential though ephemeral structure: the first telematic art review, *Art Access,* published by Orlan and Frédéric Develay. It had two issues which could be accessed in 1985 and 1986, the first issue having been written for the *Les Immatériaux* exhibition. This review thoroughly examined all the art fields while giving writers the possibility to write works specially adapted to the Minitel and accompanied by a critic's text. The review brought together such diverse artists as Ben, Fred Forest, Roy Ascott and Pierre Garnier, to mention but a few. Overall, eighty artists had realized fifteen-hundred screen pages. It is to be noted that *Les Immatériaux* appeared as a climax for A.L.A.M.O. and as a starting point for the dynamic poetry which was to develop in the following years. The second issue of *Art Access*, published in 1986, contained papers by Frédéric Develay (who was also in the first issue), Tibor Papp and myself. Frédéric Develay introduced me to Tibor Papp at the beginning of 1988. It turned out that the texts that we were developing independently were so much in agreement in their aims and techniques that the idea of a team was born. A "federating" event was necessary: it was the gathering heralding the opening of the Maison de la Poésie of the

6 Review *Docks*, Akenaton, Ajaccio.

7 One might quote, among others, the names of Brigitte Dorez, Benoit Carré, Jean-Michel Henniquez, Martial Lengellé, Jean-Marie Dutey, Frédéric Develay and Philippe Bootz.

8 Among others, the introduction of the EUTOPIE group in the *revue parlée* of the Pompidou Center on March 22, 1984 together with a small one week exhibition; the *Texte Autre* exhibition at the Roubaix resource center from December, 1-29, 1984; the *Satellisation, dessins en utopie* exhibitions, which took place at the cultural center in Amiens from May 18 to July 13, 1985 and the *laser ⊂ texte* installation in the J.J. Donguy gallery in Paris, September 7-27, 1985.

9 The relationship between these actions and dynamic poetry on video or electronic media was discussed at the international workshop Littérature et Informatique which took place in the Paris VII University in April, 1994. A paper on this theme entitled "Gestions du temps et du lecteur dans les poésies dynamiques," by Philippe Bootz, was published in the proceedings of the workshop (Littérature et informatique: La littérature générée par ordinateur, AUPELF-UREF, Paris,1995).

Nord Pas de Calais, the local poetry festival which took place in Beuvry-les-Béthune in the Pas de Calais from October 21-23, 1988. During this event we presented an installation of computer animated texts. The L.A.I.R.E. team, with Claude Maillard, Tibor Papp, Frédéric Develay, Jean-Marie Dutey and myself, had just come into existence. It is important to point out that each member of the team had already produced work on computers and that this meeting was the coming together of experiences which had already been evolving for several years. My first approach to generated texts dates back to 1977,[10] even though the most meaningful works (animated poetry) began only in 1985. It consisted of the realization on a personal computer of the "mange-texte" designed by Jean-Marie Dutey[11] for the 1986 *Images et Mots* exhibition in Villeneuve d'Ascq and with the design and realization on the computer of "Metamorphose," my first, not yet published, animated text. During the 1980s, Jean-Marie Dutey and myself were already working as a team. Since 1984, Tibor Papp had been creating computer texts which he had the opportunity to present at the Pompidou Center and at other places as early as 1985; and, Claude Maillard was the first to publish, in 1986, a book including a work with a synthetic voice presented on the double medium book/floppy disk.[12] At the beginning, L.A.I.R.E. explored different paths from those explored by A.L.A.M.O.: animated poetry and computer sound poetry. But, contrary to the A.L.A.M.O., nobody at the time in L.A.I.R.E. contemplated the idea of distributing the texts produced on computers other than on a disk medium, even though Frédéric Develay, who proposed the inclusion of the word "art" in the team's acronym, insisted on a possible opening towards other forms of writing such as video.

As a matter of fact, at the same time that computer animated poetry was making a start, other authors were exploring text animation, whether on computer or not, meant to be read on a video medium. It would be arbitrary and questionable today to separate the evolution of these video approaches from that of computer poetry for it is obvious that they were forming at that moment a continuum which can be described by the same pattern,[13] a continuity that was well shown in an exhibition organized by ART 3000 at the Donguy gallery.[14] As early as 1982, Roger Laufer produced at the University of Paris VIII, in collaboration with Michel Bret, a little animated text, *Deux Mots*. At the same time, Paul Nagy was exploring the possi-

10 Matrix poems, some of which were actually put on computer by a student, Jean-Michel Helincks, in 1979-1980 in the Lille School of Engineers (E.U.D.I.L.) on the University of Lille1 campus. This action is presented in *alire7*, Mots-Voir, Villeneuve d'Ascq, France, 1994.

11 Jean-Marie Dutey. 1989. "Mange-texte," *alire1*, L.A.I.R.E., Villeneuve d' Ascq, France.

12 Maillard, Claude. 1986. *le Théatre de l'écriture*, book 2: *le tome Son*. Paris: Les Editions Traversières.

13 Bootz, Philippe. 1994. Video poetry and unique reading poetry: two complementary approaches in A:\LITTÉRATURE.I, MOTS-VOIR and the GERICO-CIRCAV, Villeneuve d' Ascq. Other articles on the topic can be found in Nov' Art (January, 1995) and the video event "Video lue contèe dansée" organized by the video team *Heure Exquise!* in the fort of Mons-en-Baroeul (September, 1994).

14 (Pre) text à voir, J.J. Donguy gallery, 1993.

bilities of video with a first text, *Sécuritexte* (1980), and notably *Métro-police*, a 13' video text (1985) which contained, in a video approach, all the animation grammar which is to be found in computer animated poetry. It was also in 1985 that Frédéric Develay realized the videogram *"Lieu provisoire état du texte"* in which the picture track did not include text and which, to date, has not been followed by other attempts.

1985 was a transition period, marked by the end of experimentation and the beginning of maturity. It was then that we produced the first big event in which these approaches expressed themselves. The first symposium took place in Cerisy, organized by Jean-Pierre Balpe and Bernard Magné. All the events that were to take place in the following years (i.e., the birth of L.A.I.R.E., the emergence of electronic reviews, institutional recognition and the evolution of processes) were there in an embryonic stage. Everything was almost in place as early as 1985.

*... to that of electronic reviews*

What L.A.I.R.E. was first concerned with was the production of a review on disk, the first of its kind, *alire*, whose first issue was presented in January, 1989 at the *Revue parlée* of the Pompidou Center. Since then the review has been published with a periodicity of one or two issues a year. The review was of vital interest for several reasons. The first, and most obvious, was the need for a periodical with which to express and circulate our productions and ideas. It was a necessary tool to provide a prospect of private and intimate reading to the visual production which was to follow, making it independent of duration, independent of the before-after of a public reading. For it is obvious that an animated and visual literature could be tempted by the spectacular and take the direction of a production which would be readable in a public context, during evening performances. The review is an essential element. It enabled the rise of interactivity and the invention of the concept of the *unique-reading poem*, which unfolds during several readings. These types of texts could certainly not have come into being without the existence of the review. What publishing forms exist today for such productions besides these two reviews? I say two because in January 1991, Jean-Pierre Balpe (and not the A.L.A.M.O.) pub-lished the first issue of the review on disk *Kaos* with the

15 I think it is useful to give here their addresses. For *alire*: Mots-Voir, 27 allée des coquelicots, 59650 Villeneuve d' Ascq. For *Kaos*: KAOS, 113 rue Anatole France, 92300 Levallois.

16 Organized in Paris VII on April 20, 21 and 22, 1994 by Alain Vuillemin from the University of Artois and Michel Lenoble from the University of Montreal with the collaboration of Item-sup and the Ingénierie didactique laboratory of the University of Paris VII.

help of the firm KAOS.[15] The recent workshops on literature and the computer[16] seem to confirm that no other enterprise of this kind exists in other countries. These reviews were the first to circulate literary works on disks and it is interesting to compare the first issues.

Note that they do not compete with, nor really complement each other, rather they are parallel. In the first issue of *Kaos* there are animated texts by Tibor Papp and by myself. In issues 6 and 7 of *alire* one sees generators by Christophe Petchanatz and by Tibor Papp, respectively. The two reviews' viewpoints differ in several ways and yet it is impossible to say at the present time if those differences are meaningful or not. They are: *Kaos* is free and offered as a new year's gift by a company while *alire* has to be paid for; *Kaos* is composed of one disk (either PC or Mac) inserted into an envelope whereas *alire* is composed of a paper sheet and several disks per issue with, generally, a mixture of PC and Mac disks. *alire* also includes an audio cassette for the sound texts; *Kaos* makes sure its disks are as readable as possible. For instance, the first issue, on PC, only contains CGA texts, the most universal but least rich video norm, whereas *alire* accepts from the start the idea that a reader might have difficulty getting acquainted with some of the review's texts. PC disks are not "translated" into Mac or the reverse. The present connection between the two standards, which should shortly do away with this difficulty, does not make this acceptance any different, an attitude


*alire* was the first periodical on disk dedicated to the publication of digital poetry.

which is certainly new and a priori shocking for a review; and the last point to be noted is that the last issue of *Kaos* (94) does not contain any disk, but is made up of a pack of cards. Other reviews have shown an interest in the development of these computer approaches, notably *Action Poétique* which published an issue devoted to the Oulipo (number 85), another on the A.L.A.M.O. (number 95), and a common issue with *Kaos* (number 129/130).[17] Furthermore, video poetry was able to ex-press itself with the literary and artistic review on video cassettes *p'Art* started in 1987 by Paul Nagy. This review is no longer circulated. We refer the reader interested in further details to works on the topic.

**From the A.L.A.M.O. to L.A.I.R.E.: altering perceptions**

*Shifting words*

Let's consider the interrogation of ideologies which have raised a significant turmoil among readers clinging to ancestral uses. Use of the computer seen in relation to the literary object has evolved from the first experiments of the eighties to the pre-sent productions. Many signs act as evidence. The first is visible when one compares the A.L.A.M.O. (a workshop of mathematics and computer-assisted literature) and L.A.I.R.E. (Lecture, Art, Innovation, Recherche, Écriture) acronyms. One can note the presence of the word "assisted" in the first, and the absence of the word "computer" in the second. One can also note the presence of the word "literature" in the first but with its development by the words reading-art-writing in the second. The way approaches are positioned in the cultural microcosm has obviously evolved.

*The text and its medium*

First of all, the computer is considered as outside the literary object — a necessary tool to the act of writing. The text considered is the object generated by the latter. It is readable on paper. In this way, the prelude to issue number 95 of *Action Poétique* speaks of "computer assisted writing programs," of "texts obtained by means of diverse computer programs." Guillaume Baudin spoke at the Cerisy symposium about "text generating machines";[18] generators were only analyzed under their algorithmic aspect, though Balpe quickly announced a series of issues around the notions of text, author and reader. These issues were presented in his article "L'ange ou le diable en boîte" published in *Action Poétique*, number 95.

17 *Action Poétique*, Avon. Number 85 dates back to 1984 and number 129/130 to 1992.

18 Guillaume Baudin, "A pretext for idleness" in Balpe, J.P. and B. Magné, editors. 1991. *L'Imaginaire informatique de la littérature*. St. Denis: Presses Universitaires de Vincennes, 152.

This position of the text as "generated" and of literature as "assisted" completely disappears with L.A.I.R.E.. This position is not linked to the "low generating" nature of most of the L.A.I.R.E. team's productions. Indeed the only "classic automat-ic generator," insofar as it reproduces the procedure set up by Balpe, is Tibor Papp's "disztichon alfa" published in *alire7,*[19] whereas a generator of Raymond Queneau's "hundred thousand billion poems," also programmed by Tibor Papp is present in *alire1*. This text by Queneau was programmed because the display on paper did not make it possible for the uncertain, statistical and "to be read" nature of this text to be wholly expressed. The uncertain nature was not respected because the book often opened at the same page, destroying the equal probability of the combinations. The statistical nature was not verified since the immanence of the other "pages" in the book's bulk gave a "simultaneous presence" to the possible combinations. The result of a throw of the dice is a decision, a produced and not potential event, the only one to exist, making the other elements of the mathematical series of results permanently swing from a throw of a potential nature to pure and simple nonexistence. On screen, nothing exists except the realized combination. There are no other alternatives to this reading, even if other readings of the same generator remain possible. It is exactly there that the swinging over in the conception of the text occurs: apprehending the "generator" in its specificity of generator and not the generated product as *the* text, which would be "one among an infinite number of texts."[20] This apprehending, this understanding, is not reading yet, but a necessary condition to its starting. It requires, in any case, the physical presence of the generator, the only one able to produce the real time inherent in this transformation which, from endless possibilities, produced a unique and exclusive object that we shall no more call the text but the "text-to-be-seen," to remain in accordance with the developments that are to follow. A generator can only be given to be read on a computer and 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. And this is true of all the texts which possess a generating nature linked to the intervention of chance, of calculation or of the factual (interactivity) during the production of the text-to-be-seen. So the computer, a writing tool for the author, is turned into a reading tool and there is no longer any point in mentioning "assistance."

19 Papp, Tibor. 1994. "disztichon alfa." *alire7*, Mots-Voir, Villeneuve d' Ascq.

20 All these reasons specify the position of the text and of the reader and assert the book's limits with regard to these positions. One may consider the programming of the *cent mille milliards de poèms* as L.A.I.R.E.'s manifesto and *alire1*'s other texts, whose aggressive nature can be noticed, as an alternative to automatic generators which transfer the focalization from the text's author to the reader.

The nature of the text's medium was worked upon in *alire* thanks to the presence of the paper leaf, whose role became clearer with the newer issues. If the first issues mixed graphic or written poems (produced on a computer) and theoretical texts, the decision was made after number 5 (December, 1991) on to no longer publish poems which would only use the computer as a particularly efficient production tool for texts with no generated nature. The leaf, then, became the exclusive medium for theoretical texts until number 7 when a new phenomenon appeared: a dialogue, *within the same text*, between a generated (or animated) part and a non-generated part. This dialogue is to be found in Jean-Marie Dutey's work as well as in mine, though with different procedures. Computer poetry may require a computer medium in connection with other media. Conversely, there is no non-generated screen-page on *alire* or *Kaos* disks. It is a very clear "no" to the multimedia approach which presents itself as a big "mixing" of genres. We shall not follow McLuhan on the unifying, reducing and totalitarian path of the "global village." We consider this position a little further on, a position which demonstrates the permanence of the traditional private and intimate nature of literature. There is a very clear-cut separation between genres and in *alire* we would not accept to publish "screen versions" of static, non-generated texts designed to be shown on paper.

More generally and most certainly today, no one would contemplate showing "program-produced texts" without offering the generator itself to be read on an electronic medium. This evolution is obvious. For instance, the joint issue *Kaos* 92/ *Action Poétique* 129/130 includes this aspect: "This issue of *Action Poétique* includes a computer disk, thus we wanted, in line with the rest of our work, to engage in writing at the same time as in reflecting about writing."[21] In the same way, we have the varied symposia, in which nonacademic authors are beginning to appear, either physically or by means of their works shown on the appropriate electronic medium (video or computer). Thus, during the "Nord Poésie et Ordinateur" conference organized by Mots-Voir at the University of Lille in May, 1993 with the collaboration of the research center GERICO-CIRCAV and of the Maison de la Poésie of the Nord-Pas-de-Calais, half of the time was devoted to the projection of works and the other half to papers and theoretical debates. At the last Jussieu workshop, the authors asked for projec-

21 *Action Poétique* 129/130, Avon, 1992, 4.

tions and displays and Paris VII's technical department was able to meet their demand. Proceedings themselves do not escape the rule: the proceedings of the Lille conference, A:\LITTÉRATURE↵ include two disks (one for PC, the other for Mac) which show examples of the different "styles" that can be seen today in computer poetry in France. There is also an electronic edition of the proceedings of the Jussieu workshop.

*No longer a written text to be read,*
*but a written text -- a text to be read*

Computer authors place themselves within a literary continuum rather than in opposition to the poetic forms, whether traditional or not. On the contrary, they push poetic forms to the end of their logic, in a very modernist perspective. This leads to reconsidering their productions according to criteria which are not ne-cessarily new, but which are sharpened and outside past fashions. Indeed the Lille conference brought to light an approach to the computer by visual poets, essentially Americans,[22] as well as points of convergence between approaches derived from post-dada trends and approaches felt as more traditional. One easily understands then the public's opposition to this approach, which no longer relies on criteria instituted by the acceptance or the refusal of dadaism and the epic which followed. This approach relies on a feeling that the computer is coming at the right time, and in a more definite way than other forms, to propose a new approach to the triad author-text-reader and that this approach is perfidiously part of a continuous process, opening new doors. Thus, Jean-Pierre Balpe announces in the presentation of *L'Imaginaire Informatique de la Littérature* (1991, 27): "Since, however, they (the computer authors) do not question at all the notion of literature, as they on the contrary claim they belong to it and feed on it, the fact that they bring us to reconsider its nature and consequently its evolution seems unquestionable now." I, for my part in *alire2* (1989) noted the continuity between computer and visual poetry approaches: "thus may be dawning this poetry, free from the paper language that twentieth century poets seek." And yet the approaches are different in the two texts. Jean-Pierre Balpe continues: "Writing is no longer producing a given text but establishing abstract text models. The originality no longer lies in the product but in the production procedures." This very clearly sets out a hierarchy between a "program" and its product, only awarding the status of text to the latter. But more than the organization of

22 See the articles written by Orlando Carreño or Jacques Donguy in A:\LITTÉRATURE↵.

texts into a hierarchy, it is the importance of the structures (the production procedures) that is put forward. Whether the latter is removed from the product apprehended by the reader to the structure designed by the author, seems to me of minor significance, even though this has been the first stumbling block with readers, and is a point often debated. The sequel of the *alire2* text states that "being obliged to build the tools and the rules at the same time, to take the text as a pretext and as an object to be programmed, writing ... organizes itself as an object and, for the first time perhaps, as outside itself. It is the first time indeed that the results of a text, its 'to be read' aspect is not written in the same language as its "written materiality." This also is likely to disrupt the relationship between literature and its language...I am not trying to inform nor even to make it readable. The text is an organism that one makes one's own and that one destroys to read it. Let us note that this textual organism is not the metastructure set up by the author but only a product of the latter." Here a separation of the text into two sides is taken up. The "production procedures" and the "to-be-read" aspect (an entity that makes up the text in almost all paper literature) are the complementary aspects of the same object, but which are not perceived in the same space, with the same relationship to the text. One belongs to the author's private sphere — the other to the reader's. In this vision, it is the relationship between the topic and the text which is given more value, with reading prevailing over writing. The latter is felt as cannibal, destroying the text that it is reading but without any effect on the object made up by the author. The independence between text/author and reader/text relationships naturally leads to the text's perceptual split. It is to be noted that this cannibal aspect given to reading will have strong repercussions on the way the texts themselves function, until it makes the notion of "unique-reading poem,"[23] whose "to-be-read" aspect evolves in an irreversible way with the different readings.

**From the text designed as an object, subject to a functioning process, to the text designed as a medium to initiate reading**

*A structural approach; a functional approach to the text*
The A.L.A.M.O. authors have been trained in the Oulipo ideology according to which the text is first and foremost a linguis

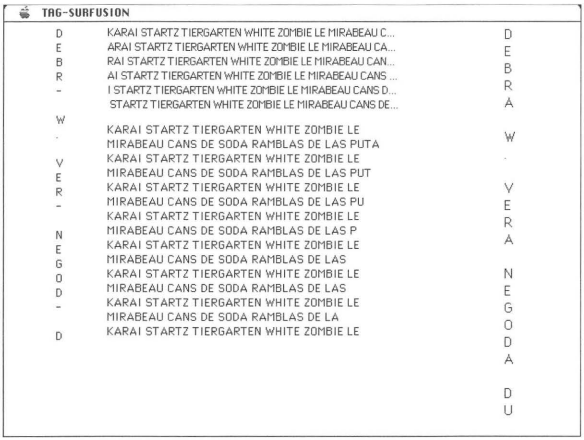
23 An example and a comprehensive presentation is to be found in A:\LITTÉRATURE↵. In a few words, a unique-reading poem can be presented as a hypertext generating an animated text in an irreversible way. Indeed interactivity brings about a navigation of an inter-textual nature in the generator without the reader's knowing. The latter does not see this navigation nature at all nor even, for that matter, the generating nature of the structure since he can never come back to the same sequence. These aspects can only appear during exchanges between readers. The irreversibility is due to the fact that any act initiated by the reader is memorized for good and has an influence on the reading in process and those to come. This type of text can only function with a substantial number of interactive readings (ten or so). All things considered, the text-to-be-seen generated beyond that number of readings is no longer interactive but has a history for the one reader who generated it. It is to be noted that the concepts of that type have been proposed in Philippe Bootz's article, "The unique-reading poem," les Cahiers du CIRCAV nr 3, GERICO-CIRCAV, Villeneuve d' Ascq. 1993.

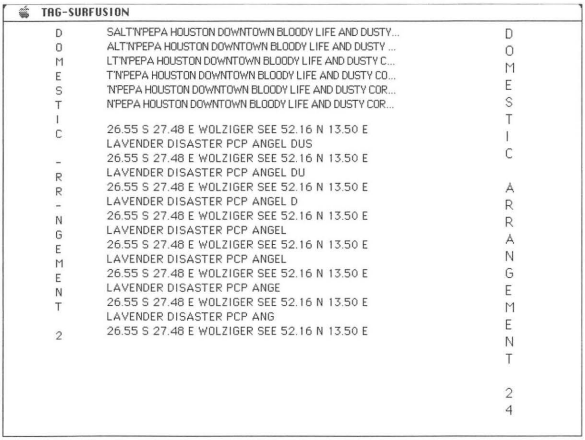
tic structure. Jean Ricardou says so very clearly: "From now on, I, for my part, wish to define the text as a written work carrying further structures,"[24] a sentence which describes the different types of possible structures. These authors, then, essentially manufacture structures and are not saving technical explanations on the way they function, whether on the products of generators or on the generators themselves, whose structure is not to be mistaken with that of generated texts-to-be-seen. These informational mathematical structures, the "describers,"[25] are essential at the generator's level, whereas this notion is completely absent from generated "texts." Priority, which has, willy-nilly, to be qualified as ideological, was being nevertheless given to the generated text, the generator being only presented as a "program," that is to say a means of production. This approach to the text is part of a literary tradition which hastened to evade dadaism and the various poetic upheavals of this century.

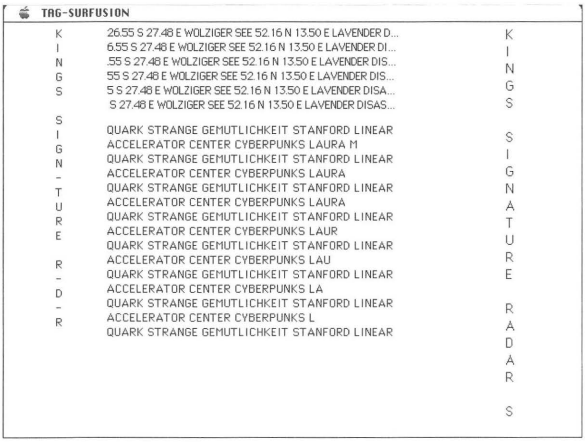
L.A.I.R.E. substitutes two actions, reading and writing, for a textual object, favoring the notion of text according to two relationships: the author/text and the reader/text relationships. The text is no longer an independent object as much as the space in which two relationships are applied. The difference is significant. Its connection with the author, on the one hand, and with the reader, on the other, should therefore be taken into account in any discourse on the text and it should be very accurately specified *in which of the two relationships the characteristics stated about the text are applied.* For it turns out that, as we have already noticed, the notion of text does not apply to the same object in the two relationships, and this happens independently from the presence or absence of the computer. This approach means substituting a relational or functional analysis for a structural analysis of the text. The important issue actually is no longer to "give a purer meaning to the words of the tribe" but to "postpone the reading process during writing." That is to say that the writer's role (and not the text's) is to *make read* in a particular way. This is what he or she is aiming at. Action has priority over the object and, within the former, reading has priority over writing. The text becomes the operational space for a reading function, the necessary medium for its realization. Before looking at the way this functions, we have to notice two things.

24 Jean Ricardou, a discussion following Bernard Magné's article, "L' Imagination informatique de la littérature," 204.

25 See, for instance, the most comprehensive work to this day, which de-scribes in detail the way several generators from the pioneering days function: Balpe, Jean-Pierre. 1986. *Initiation à la génération de textes en langue naturelle.* Balpe. 1990. *Hyperdocuments, Hypertextes, Hypermedias.* Paris: Eyrolles.




Screen shots from *Tag-Surfusion*, a digital animated poem by Jacques Donguy. The poem first appeared in *alire8* in 1994.

The first is that this approach places the text in relation to non-literary fields, a positioning that we shall analyze in detail later. The second is that the two structural and functional aspects are complementary and do not exclude one another, as any realization of a reading function can only be carried out through particular structures. Each structure generates its reading mode. The writing of most A.L.A.M.O. generators supposes for instance that it is the aesthete or the scholar who will read them. The reader is asked to participate in the playful experience of discovering the structures that they propose. These structures are not necessarily given, since this is what they are about; their presence is clearly announced.[26] In *alire*, on the other hand, the presence of the structure is only given when the reader's action modifies the generator's possibilities in an irreversible way.[27] The reader is informed of the existence of a structure which reacts to his action. Apart from this extreme case, the reader does not even always realize that chance or calculations intervene in the poems published in *alire*. He therefore does not feel like reading them again with a "look for the differences" spirit. Consequently it seems reasonable to deliver hidden structures, texts of which only a part is offered for reading without the reader being able in any way to realize this is so. If one considers structures which can in no way be read so as to exhaust them, one realizes that. The notion of text apprehended in the relationship author/text does not correspond to the notion apprehended in the relationship reader/text.

*A functional model for the text*

A model for the functional approach to the text is beginning to take shape.[28] This model goes beyond computer poetry and has been applied, among others, to location-poems, to certain forms of visual poetry, to certain readings and performances. It specifies that the author produces a *texte-écrit* (written-text), an abstract structure made up of a logic applied to the rules governing the functioning of a conceptual material. This logic may be sequential or factual. This *texte-écrit* is a project not to be mistaken for the material form it takes up in the author's work (storyboard, program, etc.). The material aspect *describes* with technical words, appropriate for a reading medium, the logical structure, the shape taken by the concepts as well as actions which can be performed on them. At this level, language does not exist as such. Grammar, notably, is an element of the material and not of the logic of functioning.

26 A typical passage from this announcement is as follows: "Reading the text once does not guarantee that you have used up the possibilities. You have to read and read again..." in *Action Poétique*, 129/130, 6.

27 This information was given directly on the disk as an introduction to the extract from the unique-reading poem "Passage" by Philippe Bootz in A:\LITTÉRATURE↵.

28 Through the three articles already quoted from the Cahiers du CIRCAV nr 3, from A:\LITTÉRATURE↵ and the acts of the Jussieu workshop.

Whatever material form its description may take up, this *texte-écrit* is a generator. It is going to produce *textes-à-voir* (texts-to-be-seen) on a particular medium which makes up the readable part of the text. These t*extes-à-voir* may be classified concerning computer poetry, in a few genres: automatic generators, animated poems, sound poems, unique-reading poems. The characteristics of these various types of texts have been widely described in the already mentioned works and we shall not recall them here.

The *texte-à-voir* is essentially located in time, if only that of reading. It is found in a reading context made up of all the physical components present during the reading and not managed by the *texte-écrit*. It is, therefore, not the latter which will be read, but the entity resulting from its association with the reading context. Eventually it is this entity, the only "objective" one in the relationship of the reader to the text that the reader apprehends through interpretative filters and reading grids to produce a *texte-lu* (read-text) located in his or her memory.

The author will translate his or her functional ideas by a particular bias of the *texte-écrit's* logic. The specificity of the "reading process," of the method according to which the *texte-lu* is constituted by the reader, is an essential component of his or her style. One cannot really speak of the reader being manipulated by the author since it is the *realization procedures* of the *texte-lu* that he or she is concerned with, and not its contents. The reader is not required to build a "fair" *texte-lu* or, in other words, to discover "what the author said" or to apprehend the "formal subtleties" of a *texte-à-voir*. The notion of misunderstanding, notably, does not belong to the *texte-écrit* nor, consequently, to the *texte-lu* (unless it is reintroduced by the very reader).

*Poetry in the information society*

The functional vision relies on an ideological response to society's functioning, or at least to a part of it. The functional approach seems to me typical of the generation that is thirty to forty years old today, and is visible in all genres (whether on computer or not) and all groups. It is not restricted to computer writing. Thus Benoit Carré in 1986 noted, concerning the location-poem he had realized for the *Images et Mots* exhibition in Villeneuve d'Ascq: "Because the text derives its mean-

ing from the situation (which its presence gives birth to), it is not possible to propose through it a possible message, a vision of the world, however fragmentary: the reading act reveals nothing but particular relationships (material and semantic) between a text, an environment and a reader."[29] As early as 1984, still about the reading of location-poems, I wrote "that poetry then does not transmit a discourse on lived experience, but a lived experience on lived experience."[30] After all, reading is a reader's performance, to take up the vocabulary used in the seventies. Of course, no approach is totally structural, nor totally functional. No approach excludes the other. Jean-Pierre Balpe's developments concerning the alterations of the concept of author are closer to a functional than to a structural approach.

An example of the difference in viewpoints between the structural and functional approaches is given within L.A.I.R.E. itself by the debate around the impact of the computer's reading speed, as presented in *alire's* leaf (1990). In those notes I developed the idea that the machine plays an active part during the reading, close to the "performance" that can be found in music, and that the author must know and accept this fact which is part of the concept of reading developed in the theoretical model:

> This translation of the work by the machine is a true treatment of the semantic signal of the text-to-be-seen prior to any reading. It cannot be avoided. This is not a deterioration of the signal or an added background signal as happens with audio... In a way, the text-to-be-seen, the real poem, which will be read, is not stored even in the floppy disk plus machine set.
>
> This dematerialization, a sign of individualism, but also of a free reading, may be what fascinates me the most in computer literature as I see it.

To which Tibor Papp answers in the article "Littérature sur ordinateur - Enregistrement restitution" in the same issue: no, the situation is the same as that of sound poetry when tape recorders appeared, the situation will become stable and the problem will disappear:

29 Benoit Carré, the catalogue of the *Lecture* installation within the *Images et Mots* exhibition, Villeneuve d' Ascq, 1986.

30 "Un modèle du monde vécu," Philippe Bootz in the catalogue of the *Texte Autre* exhibition, Mots-Voir, Villeneuve d' Ascq, 1984.

> The essential difference between electronic works and those of the previous period lies in the way they are set on a final medium; this setting is not simply substituting writings; it uses a large number of relevant literary effects that cannot be separated from the electronic world; as in sound technology where "cutting up" and "editing" are an integral part of the literary works thus conceived.
>
> In this type of setting, the question is most of all to extend the senses or rather to go beyond them... It goes without saying that when one speaks of electronic playback on a cathode screen or with an amplifier, one supposes optimal retrieval, as worked upon and wanted by the author... Considering that the normalization of computers remains a problem, there may be incompatibility between the recorded work and the retrieved material. This type of incompatibility is very familiar; it already existed for sound works in the pioneering times of tape recorders.

One feels on the one hand, the functional approach, which puts the stress on reading "at any cost," and the structural approach on the other, which puts the stress on an object, the text, as an extension of the author. In this approach, the text is to be preserved considering the existence of a literary nature, even if this is specific to an electronic mode. It is to be noted that the functional approach does not deny the existence of a literary nature, but that it makes it subordinate to the reading. What should be aimed at is the existence of a specific reading procedure. One may also note that the structural approach establishes a specificity of genres by the specificity of the medium (McLuhan's "the medium is the message"), whereas the functional approach establishes a specificity of genres by the specificity of the reading concepts. If the functional vision had to be summed up in a maxim, it might be "the poem only exists in the memory of those who read it," thus favoring the reader/text relationship. For instance, the same animated text, read on computer or video screen, will not have the same results because of very different reading contexts. It will then be possible to speak of two different texts with regards to an object which, however, offers two identical texts-to-be-seen. In the same way, one will be able to talk about two different texts concerning the same program running on two very differ-

ent computers implying very different reading contexts. The striking example is Jean-Marie Dutey's *mange texte*, programmed in 1986. The version published in 1989 in *alire1* gives very different reading results depending on the computer's speed.[31] The text is subordinate to the medium in the structural approach, and to the reading context in the functional approach. Of course, taking into account the reading context generated by the machine's specificity must not be an alibi to accept anything — the author generally wants his or her text to remain readable in a certain field of possible "contexts." As soon as these contexts prevent any reading, a remedy has to be found. This is what is now happening with the rise in speed of computers, a rise which was unforeseeable just a few years ago, and which requires some alteration in the programs of animated texts so as to master the speed of the ani-mations and guarantee their readability. This will be done when a new edition of *alire* is published by Mots-Voir.

One may consider the functional approach as a response to an individualistic information society. It is a subject-to-subject response, with a private, even intimate nature, noninformative in the sense that the written-text produces limited information compared to the actions performed by the reader (compared with, for example, educational software or other common products requiring the same amount of interactivity).

This is mostly true of automatically generated texts (seen as generators and not as "text manufacturing" machines, as was explained before) or of interactive unique-reading poems, but "classic" animated texts which include a symbolic or ironic declension of this. This personalization of reading relationships may lead to two conclusions. The text-to-be-seen being unique, it may be perceived as being meant for nobody or, on the contrary, for everybody. This ambiguity is raised for that matter in the case of unique-reading texts where the generator, for each reading, answers the reader according to an interpretation grid for the reader's actions which is the author's. Then, after "art for all," we are entering the era of "art for everyone," thus confirming a fact. What is conveyed to the reader, outside any semanticism, is a consideration of his or her reading as a founding element of the text; it means giving its significance back to reading, apprehending the reader in his or her human dimension of actor and not consumer, acknowledging his or her faculty for building meaning. It becomes a

31 For example, an 8086 chip with 4 MHz will present a different experience than an 80386 with 25 MHz.

source of freedom, rather than a reproduction of Pavlov's formal games. And this takes place during the creation of the text by the author. Then it means that creators are meeting, a meeting postponed in time in the same way as with telephone and answering machines. It entails that any reading is "work" before being enjoyment. It requires effort and will, a will which is required as soon as the medium is approached, for the "handling" of the floppy disk to become a "hands-on reading experience" of the texts it contains. This effort may even become a matter of perseverance for the reader who does not own the standard machine on which the text is written.

Similar approaches exist in electronic art, as in the aesthetics of communication of Fred Forest and Mario Costa. Compared to electronic art designed to function in public performances, the new kind of poetry discussed here is original in its own right, as it proposes a "private" experience which asserts itself in duration.

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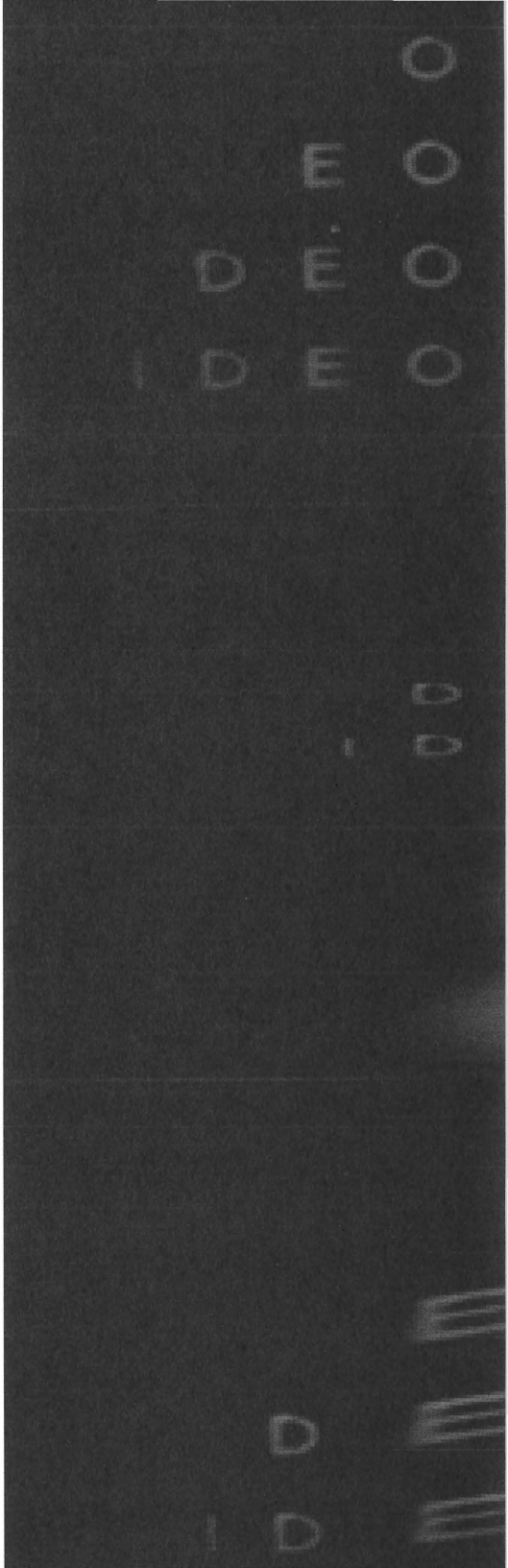

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*Visible Language* 30:2
E.M. de Melo e Castro, 138-149



This paper is a theoretical approach to videopoetry. The concept of videopoetry as distinct from videoart came as the result of experimenting with video for creative and poetic production using verbal and nonverbal signs in 1968. It was not until 1985 that I had the opportunity to develop a new body of video work. Videopoetry soon became a new kind of poetry in its own right, with its own grammar and semantics. Thus videopoetry is a challenge for poets and readers as we are drifting away from Mallarmé's galaxy and cannot escape the worldwide information sphere.

# Videopoetry

E.M. de Melo e Castro

# 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.

The task of breaking these frontiers has been mostly in the hands of scientists but the appropriation of scientific concepts and of technological products is certainly the most exciting challenge the poet can set for himself or herself both as an inventor and a producer of things of beauty. I refer to a beauty of a different kind, one that necessarily goes beyond the established canons and sensibilities. But the use of new technologies to produce art is not only the appropriation of new tools. It is much more the breaking through to a different poetic perception.

The idea of the poem as a verbal galaxy of signs, first proposed in modern times by the French symbolist poet Stéphane Mallarmé, haunted the creative writing of the first half of the twentieth century. This galaxy includes the idea of the white page as a musical score standing as a challenge before the poet. This white page belongs to an ideal book the poet must write as his or her ultimate goal. But in the second half of the twentieth century things gradually changed under the pressure of scientific discovery, technological sophistication and the democratic diffusion of their effects on our perception of the world. The poet is no longer facing a white page. He or she faces a complex set of electronic apparatus and their multiple possibilities to generate text and image in color and in movement. The poet is confronted with his or her own skills to operate technological equipment.

The page is no longer there, not even as a metaphor. Space is now equivalent to time and writing is not a score but a virtual, dimensional reality. Thus the idea of the book is coming to a crisis as it is gradually replaced by other means of external memory such as the videotape, the floppy disk and even more by the CD-ROM. These media bring new possibilities for writing and reading as simultaneous space-time sequences, metamorphoses of signs and colors, and the navigation on the highways of global communication. Videopoetry is thus a new possibility in the domain of the virtual.

When I began using video technology to produce my first videopoem, *Roda Lume* (Wheel Light), in 1968, I did not know where the limits were and where my experiments would take me. I was really experimenting on the most elementary meaning of the word "experience." A sense of fascination and adventure told me that the letters and the signs standing still on the page could gain actual movement of their own. The words and the letters could at last be free, creating their own space.

The poetic function of language as defined by Roman Jakobson emphasizes the message and its materials and structure. Thus 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 noncreative tasks. Videopoetry is then inevitable as a concept, responding to the challenge of the new technological means for producing text and image. Videopoetry is also an investigation of the specific characteristics of the electronic text, as opposed to those of the motion picture and the massification of television broadcasting. But what are the specific characteristics that make video an adequate medium for poetic production?

Until it is possible to establish a new set of aesthetic values belonging specifically to each new medium, we know that a new medium is at first seen and judged against the medium that came before it. Photography was judged against painting; cinema against theater; video against cinema. As for videopoetry the immediate reference is the experimental poetry of the '60s as iconized text. But the ultimate goal is to investigate video as a medium capable of developing by itself a new kind of reading pleasure. At first sight the aesthetic values present in video are the intimate relation of space and time, the rhythm of movement and the changing colors, all pointing to a poetics of transformation and to a grammar of integration of verbal and non-verbal signs. All these features contribute to a different and perhaps new meaning of reading.

One important point that needs careful consideration is time, because it is precisely a complex kind of time that the videopoem gives us.

On the static written page the characters, the syllables and the words are still. The movement of reading belongs to our eyes following the sequence of signs commonly organized as horizontal lines from the top to the bottom of the page. In some forms of print-based visual poetry this may not be so, and it is the reader who with his or her eyes must find the starting point and the possibilities of the reading sequences. But in both cases the movement belongs to the eyes and to our imagination as reading goes on. During the watching of a videopoem on the television monitor, the text (verbal and non-verbal) is not still. Letters, syllables and words all move in different and sometimes unexpected directions and ways. The scale of the signs can also be variable and so can their definition against the ground. Color is also a variable sign in itself.

Reading a videopoem is a complex experience as different moments of perception will coincide with moving and changing images. Thus we are confronted with different times and rhythms: a) the time belonging to the videopoem as one of its variables; b) the move-

ment of our own eyes trying to find a way to read the signs; c) the time of our own decoding and understanding of what we are actually seeing.

A new poetics of reading is thus on the way.

Then we have also to consider the different possibilities of editing the images, creating either slow or quick sequences that will give different perceptual values. A quick time results in instantaneous visual apprehension tending to the limit of the subliminal. On the other hand, a slow time of editing will tend to the internalized reading opening a subjective enjoyment.

A concept of "visual time" is thus very important for a grammar of videopoetry as it defines the appropriate time of reading of each poem. Editing becomes for videopoetry a kind of musical tempo for visual images.

Color is a fundamental element of grammar as an orientation element to the movement of verbal and non-verbal elements. It also drives the reader's eye movement acting as a semantic and emotion generator.

Sound, as music, human voice or noise, is part of the videopoem. It makes a counterpoint to the visual images and to create an atmosphere that facilitates the reading. But silence as a musical element is also important.

On the whole, a verbi-voco-sound-visual-color-movement complex and animated image is created calling for a total kinesthetic perception.

It is interesting to note that the motion picture image is primarily a natural one captured by the camera, and that what we actually see on the screen are images representing only a part of the total reality of the scene. However, the images of the videopoem are completely generated or transformed by electronic devices or digital functions. These images do not exist outside the apparatus that produces them — they have no outside reference and can be stored on magnetic or optical supports.

Videopoetry is therefore made of virtual images organized in metonymic sequences. We are thus forced to recognize that, contrary to traditional and verbal poetry, it is not the metaphor that prevails in videopoetry. The images have a more iconic character rather than a symbolic one.

Nevertheless, video as a medium and as an organizing principle of virtual images is a metaphor of reality. It constitutes a metalanguage. It is a multiple generator of visual discourse and poetic perception.

## A personal trajectory

As for my personal experience, I began experimenting with words within the frame of verbal poetry in the '50s, searching for an economy of language that very soon brought me to the transgression of grammar, experimenting with combinatory algorithms applied to verbal materials, words and letters. I went from the hypotaxis to the parataxis abolishing the difference between verbal and non-verbal and reaching a totally visual concept of invention. The next step was starting to experiment with the means of making poetry. Concrete poetry in 1960 was for me not an arrival point, but rather a launching platform.

At first I wrote experimental poems by handwriting them or using old typographic fonts. Later letterpress techniques made the work easier. Soon it became evident to me that experimenting with letters and with different materials was the appropriate way to produce visual poetry. So I made poems with paper, wood, textiles, stone and plastics, often using collage techniques. Now I use light to produce infopoems and videopoems on the computer. My first videopoem — *Roda Lume* — is from 1968 when I realized that heavy materials were coming to an end as a support for communication. The dematerialized virtual image was in itself a poetic image and therefore the poem could also be dematerialized.

## Videopoemography

My own production of videopoems can be seen as a development of experience in three different tempos:

An impulse towards the use of new technological means resulting in the production of my first videopoem — *Roda Lume* — in black and white, consisting of animated geometric shapes and letters that were previously hand drawn. The animation was made by direct editing on the camera, registering image after image with a time-based corrector. A storyboard was first made with image sequence and respective time. Sound was added afterwards as an improvised phonetic reading of the visual images. I produced the sound myself.

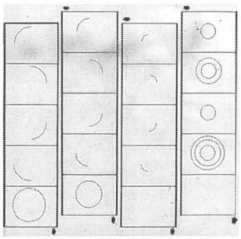


**Figure 1**-a.

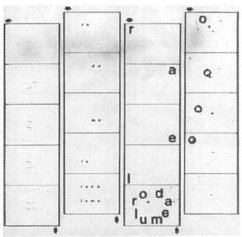


**Figure 1**-b.

This videopoem was shown on a literary magazine on Portuguese television in the beginning of 1969 and it produced a scandal amongst the spectators. It was then destroyed by the official television station as it was regarded without any interest. Now I am told that it is probably the first videopoem made as such, and that it is different from the techniques and aesthetics of videoart. I kept the storyboard drawings and was able to make a new version of it in 1986. The sound track is different as I didn't keep a recording of the original improvisation and had to make a new one from memory. The duration of this version is 2'58.' In 1985, as a result of an opportunity given to me by the Portuguese Institute for Distance Learning (IPED) and later by the Open University of Lisbon, I was able to use television studios to explore the creative possibilities offered by the new electronic and digital equipment recently installed. As a result I devised the project *Signagens* (Signings) which I developed up to 1989.

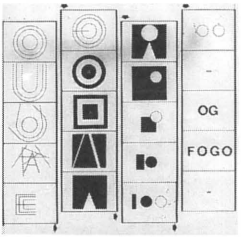



**Figure 1**-c.

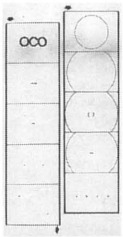


**Figure 1**-d

Storyboards of the videopoem *Roda Lume*, 1968.

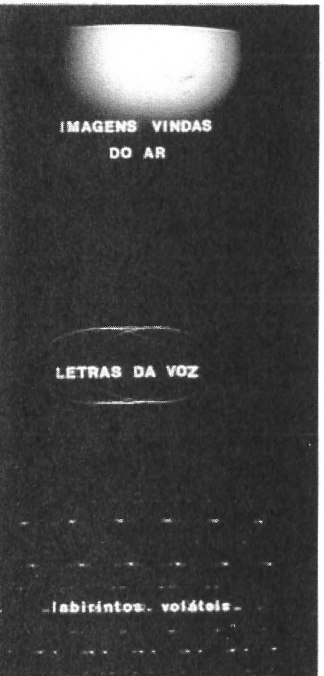
This project intended first of all to investigate video possibilities as a new medium for reading poetry. It was meant to be used in Portuguese literature classes. Very soon I realized that intersemiotic trans-


Photograms of the videopoem *Rede Teia Labirinto* (Signagens project)

lation of print-based visual and experimental poems was obvious, as video seemed to me a perfect medium for animation of letters and words. Then I produced a set of videopoems based almost exclusively on pre-existing poems from the '60s. I used mostly poems of my own from that time. The following videopoems were produced in this context:

*As Fontes do Texto* (The Fountains of the Text) - 8'30"
*Sete Setas* (Seven Arrows) - 1'29"
*Sede Fuga* (Thirst Escape) - 1'23"
Rede Teia Labirinto (Net Web Labyrinth) - 2'12"
*Vibrações* (Vibrations) - 4'13"
*Um Furo no Universo* (A Hole in the Universe) - 2'
*Come Fome* (Eat Hunger) - 1'44"
*Hipnotismo* (Hypnosis) - 33"
*Ponto Sinal* (Period Sign) - 3'55"
*Poligono Pessoal* (Personal Polygon) - 8'15"
*O Soneto, Oh!* (The Sonnet, Oh!) - 5'34"
Objectotem (Objectotem) - 5'37"
*Escrita da Memória* (Memory's Writing) - 2'14"
*Concretas Abstrações* (Concrete Abstractions) 1'30"
*Dialuzando* (Daylighting) - 5'

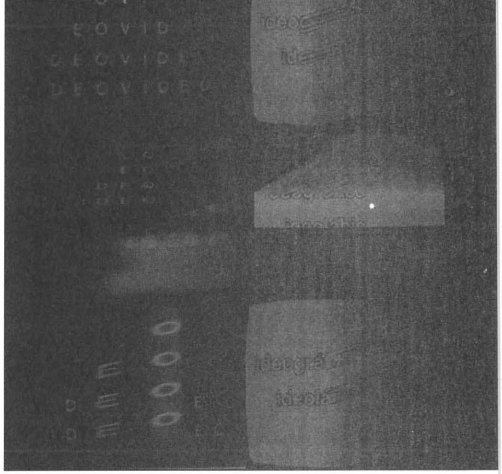
Photograms of the videopoem *Poética dos Meios*




Having made these videopoems I realized that video has its own identity and that it is a suitable medium for the production of images which have no existence outside the system. A new period started: I explored the specific virtual possibilities of video for poetic creation without having to use a poem created outside the medium. True videopoetry was beginning. My production from this period used exclusively computer generated images transformed by digital effects.The camera was practically of no use at that time. The titles of the poems then produced are:

*Poética dos Meios* (Poetics of the Media) -9'50"
*Infografitos* (Infograffiti) - 5'24"
*Ideovideo* (Ideovideo) - 7'50"
*Metade de Nada* (Half of Nothing)- 5'55"
*Do Outro Lado* (On the Other Side) - 5'
*Vibrações Digitais Dum Protocubo*
(Digital Vibrations of a Protocube) - 5'20"

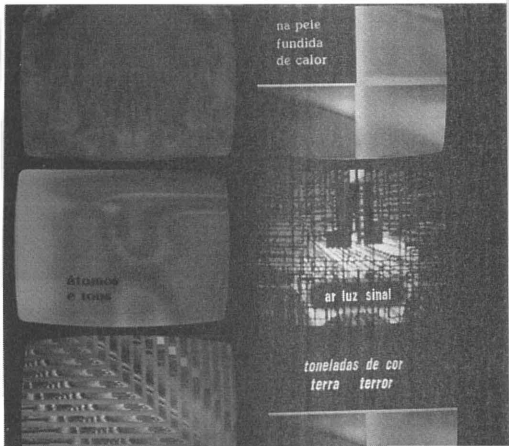
When the *Signagens* project came to an end in 1989 I was confronted with the difficulty of finding a suitable studio to carry on my experiments. After various frustrated attempts I decided to install at home my own studio and started buying old and discontinued equipment still in good working condition though of very small commercial value, together with VHS, VCRs and personal computers. I believe that more important than very sophisticated hardware is the creative mind that uses it. Thus in 1990 I began to produce a different kind of videopoetry using all types of virtual images and, contrary to expectation, the results were much more interesting and aesthetically sophisticated than the ones obtained at the Open University studio. They are much more intense and give a disturbing visual experience — they are a more advanced step in poetic experimentation. Up to now I produced in my studio the following videopoems:
*Ian Palach* (Ian Palach) - 5'40''
*Lixo Super Lixo* (Junk SuperJunk) - 6'
*Sonhos de Geometria*
(Dreams of Geometry) - 30'



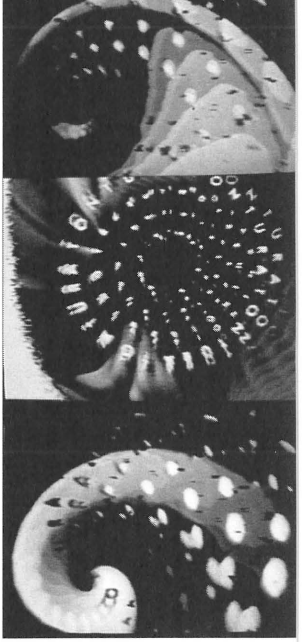
Photograms of the videopoem *Ideovideo*

*Sonhos de Geometria* is a visual meditation about transformation of shapes in space and time, developed in five videopoems. The first is *Sonho dos Bisontes Geómetras de Lascaux* (Dream of the Geometer Bisons of Lascaux) and is an evocation of the enigmatic pre-historic drawings stressing the importance of the contrast between light and dark in the production of those images.

Photograms of the videopoem *Infografitos*



The second is *Sonho de Pitágoras* (Pythagoras' Dream). It is about the birth of the numerical symbols up to the organization of the decade and the Tetraktys as a symbolic form of all numerical relations. From there we go to the invention of the famous theorem. The third one, *Sonho de Euclides* (Euclid's Dream), gives us Euclidean geometry in two dimensions hoping for the third one: the laws of perspective. The fourth poem *Sonho de Mandelbrot* (Mandelbrot's Dream) shows the forms of nature, clouds and trees as the original source of fractal geometry, rendering interactions between these shapes and the Mandelbrot set. Finally the fifth one is *Sonho de Melo e Castro* (Melo e Castro's Dream). In this poem I use my own first video poem *Roda Lume* in an intertextual relationship together with other poems of mine. All are a proposition of a new way of reading and poetic enjoyment using feedback effects with an accelerated rhythm. In the large majority of my videopoems I use electronic music specially composed by the Portuguese duo TELECTU (Jorge Lima Barreto and Vitor Rua), mostly of a minimal, repetitive character which I find perfectly suited to the nature of video- poetry. I want to particularly emphasize the original music for *Sonhos de Geometria* for its high quality and perfect aesthetic coordination with each poem. *Sonhos de Geometria* was published in Cuenca, Spain, in 1993, as a VHS videocassette by the literary magazine *Menú* under the direction of Juan Carlos Valera.



Videopoem 5 *Sonho de Melo e Castro*

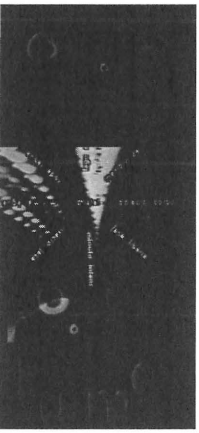
Photograms of *Sonhos de Geometria*

To complete this videographic reference it is necessary to include the videopoem *Vogais, As Cores Radiantes* (Vowels, The Radiant Colors — having as a starting point the sonnet by Rimbaud) which I made in 1986 in the RTP (Portuguese Radio and Television) studio after an invitation to participate in the series *Memória Audiovisual* (Audiovisual Memory) by Vasco Pinto Leite. Its duration is 3'7'' and the original music is by TELECTU.

Another aspect of my video work is editing the videos of my wife Cecília Melo e Castro. She is an infopainter working since 1986. In her exhibitions she often presents animated videos made from some of her infopaintings. The static work is presented in photographic prints and the animated videos are a complementary form of showing her work. But I consider her videos as non-verbal videopoems because of her intense experimental work and true questioning of the inventive possibilities of the media used. These videos, all in VHS, are:

*Infoarte* (Infoart) - 13' - 1987
*Inforritmos* (1,2,3,4) (Inforythms 1,2,3,4) - 27' - 1989
*As Aves, os Números, as Cores* (Birds, Numbers, Colors)
*Computer Dreams:*
*1/ A Imagem e a Máscara* (An Image and a Mask)
*2/ Grafismos interiores* (Interior Graphic Signs) - 15'19'' - 1993
*A Escrita das Esferas* (The Writing of the Spheres) - 13' -1994

Photograms of *Sonhos de Geometria*



*André Vallias is a Brazilian experimental poet based in São Paulo. He is concerned with the creation of a non-logocentric poetry, able to compound all forms in which knowledge manifests itself, such as words, numbers, images, sounds, etc. He regards the suitable poem for the telematic society as a kind of open diagram: compelling a non-linear, active way of reading. In 1992, while living in Germany, he organized a show of computer-generated poetry, with works from poets/artists of five nations: "p0es1e-digitale dichtkunst."*

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*Visible Language* 30.2
André Vallias, 150-157


# We Have Not Understood Descartes

Andras Vallias

The author describes his involvement with digital media and the origins of his conception of the "diagrammatic" poem; he reflects on what he considers to be a poem in tune with today's computerized society.

Continuous mutation: this is perhaps the only constant distinguishing mark of digital media. The growing speed with which hardware and software components change would seem to condemn the creators who venture into this new territory to the production of ephemera, to a permanent process of making and remaking, of endless "work in progress." The general picture is one of instability — of vertigo — and it is a source of stimulation and frustration.

I entered the computer age in 1988, motivated largely by the compelling essays of the philosopher *Vilém Flusser*[1]; financially I was able to do so thanks to the economic stability of Germany, where I had settled in the preceding year. Galloping inflation and import restrictions would have made this step extremely difficult in Brazil, my country of origin, at any time before the early '90s.

Basically, my poetic work at the time employed the resources for desktop publishing; these were substitutes for the techniques which I had previously used for the composition of visual poems: silk-screen printing, collage, photocopying, instant transfer lettering, etc. Although I was fascinated by the computer, by the breadth and flexibility of this new tool for graphics, the fact that I had perceived no significant alteration in my own poetic procedures drew me into a creative crisis which lasted from 1988 until 1990.

I put this period of silence to good use, and started research into three-dimensional space; it was there that the potential of the computer seemed to make itself most clearly evident. I exchanged the simulacrum of blank page and palette of colors — available to me through desktop publishing programs — for the black infinity and the austere and complex interface of computer-aided design; the AutoCad[2] program became my Ariadne and the coordinates xyz my magic ball of thread. The open architecture of AutoCad also led me on to my first stammering efforts in programming (AutoLisp), an experience which was to prove useful after 1994, when I started to work with multimedia authoring systems.

1 Vilém Flusser was born in Prague in 1920. He studied philosophy at the Carl's University and emigrated to Brazil in 1940, where he continued his studies at the University of São Paulo. Since 1963 he was professor of philosophy of communication at the Faculty of Communication and Arts. In 1972 he moved to Europe, where he taught at numerous uni- versities. He died in 1991. Among his most important writings are: "Ins Universum der technischen Bilder," European Photography, Göttingen 1985; "Die Schrift," Immatrix Publications, Göttingen 1987; "Vampyrotheuthis Infernalis" (with Louis Bec), Immatrix Publications, Gottingen 1987.

2 Computer-aided design software made by Autodesk.

My initial impetus towards the construction of three-dimensional letters soon wore off. I could see no possibility of organic integration between the third dimension and the alphabetic code; it seemed to me that such a proceeding would lead to an iconization which, fundamentally, differed very little from the typographic experiments found in the visual poetry of the '70s and '80s. Instead I sought to integrate the third dimension into the syntax of the poem.

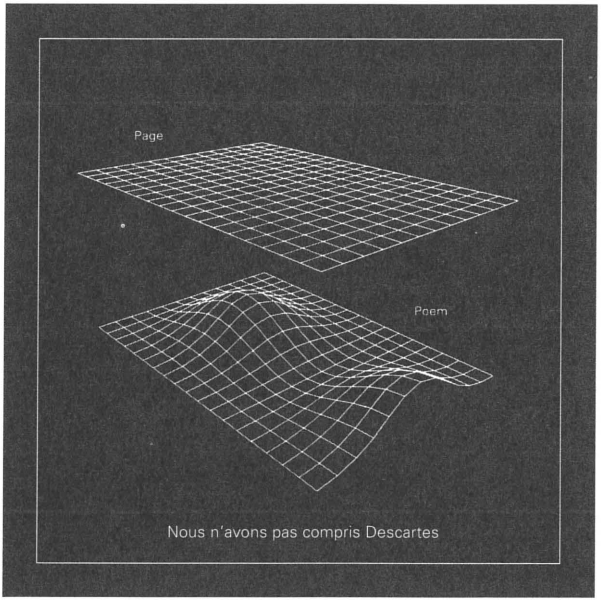
My creative crisis resolved itself in 1990, with the making of a poem which has become a landmark in my poetic production: *"Nous n'avons pas compris Descartes."* The title is an excerpt from a text by Mallarmé dating from 1869, his "*Notes,*"[3] which I came upon just when I was putting the finishing touches to the poem. These notes were an outline for a treatise on linguistics which Mallarmé unfortunately never got round to writing. The fifth paragraph in particular caught my attention: "*Nous n'avons pas compris Descartes, l'étranger s'est emparé de lui: mais il a suscité les mathematiciens français.*" (We have not understood Descartes, it's the foreigners who have laid hold of him; but he has aroused French mathematicians).

I confess that I didn't spend much time on attempts to interpret the fascinating web of Hegelian concepts to be found in the "Notes"; I was quite satisfied with the luminous insight brought to me by the text. I perceived what a mighty feat it was on Descartes' part to have created an interface between the discrete universe of algebra and the continuous world of geometry, thus establishing a basis for what, in the end, was to be the computational graphics which I was using myself.

The poem "*Nous n'avons pas compris Descartes,*" made with the resources of computer-aided design, takes as theme the relationship between page and poem; in doing so it transcends this same relationship and makes three-dimensional space the new field of meaning for the poem — its new "environment." The

3 Mallarmé, Stéphane. 1945. *Oeuvres Complètes.* Paris: Bibliothèque de la Pléiade, Éditions Gallimard, 851-856.

sinusoidal form of this "poem" may perhaps be seen as a reference to Descartes' analytical geometry; yet in the end it is arbitrary in its nature. It points above all to a virtual interrelationship of codes, a programmatic gesture which bestows on this meta-poem the character of a manifesto.

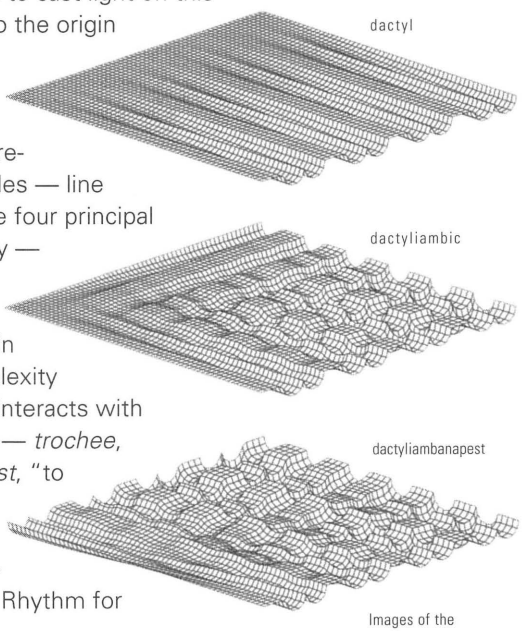



The fundamentals of its making arise from reflection on a series of visual and ideographic codes which begin to take shape during the Renaissance and the Baroque, and which continue with increasing intensity as they accompany the development of Western science and technology in all its fields and forms: from classical perspective, still centered upon mimesis of nature, to the anamorphoses of mannerism, architectural design, isometric perspective, cartography, graphs, charts, tables and statistics. All those codes, that is to say, of technical and scientific visualization which attempt to go beyond the limits imposed by the linear nature of our society's hegemonic code of communication — the written text.

The common denominator of these codes is their hybrid nature: graphic and numerical elements, color and text, to a greater or lesser degree add up to a network of reciprocities which will provide the field of meaning for the whole. It is this dynamic and syncretic complex which I call by the name of diagram — from the Greek *diá*, "through" + *graphein*, "to write."

Diagrams, in accordance with the growing complexity and volume of information in our times, find in the computer an ideal stage for development and dissemination. Digital technology provides a basis for increasingly rapid and wide-ranging inter-relationships of codes, since the computer itself transforms text, sound, form, color and movement into digits. Starting with "Nous n'avons pas compris Descartes," I have come to see the poem as an "Open Diagram," operating under the sign of diversity. Poetry is set free from the domain of the text — logocentrism — and recovers its primordial meaning of "creation," from the Greek *poiesis*, "making."

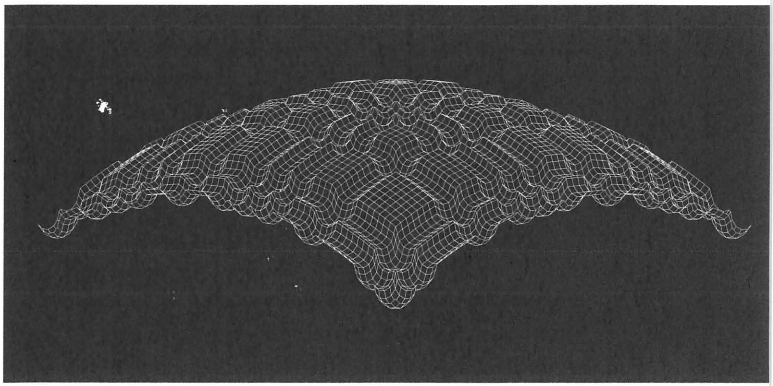
My work "The Verse" (1991), tries to cast light on this conception of poetry, going back to the origin of the word "verse" — from Latin *versus*, the furrow produced by a plough. The work is composed of surfaces built up on graphic representations of long and short syllables — line and semicircle — and following the four principal metric schemes known to antiquity — trochee, iamb, dactyl and anapest. These schemes are combined so as to give rise to surfaces (fifteen in all) with different degrees of complexity and to produce an iconicity which interacts with the etymology of the Greek terms — *trochee*, "to run"; *iamb*, "to throw"; *anapest*, "to strike"; *dactyl*, "finger." For epigraph I took an observation by the poet Gerard Manley Hopkins: "Remark also that is natural in Sprung Rhythm for the lines to be roved over..."




Images of the poem "The Verse"

The same graphic procedure is used in "*PRTHVI*," a poem written in 1991, to compose a three-dimensional surface on the basis of a type of strophe found in Indian epic poetry; this is made up of four lines, each with seventeen syllables.

**PRTHVÎ** ( Ind. = Earth) *Indian epical verse in four-lines formation, each line having 17 syllables:* ∪–∪∪∪–∪–∪∪∪–∪–∪–∪∪

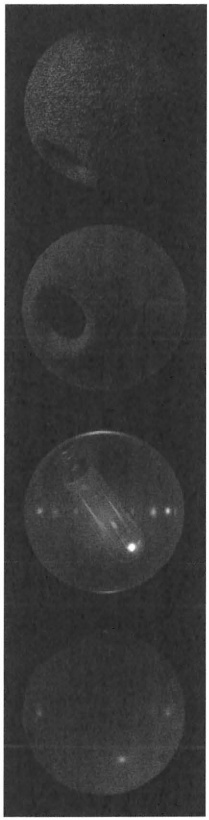


In 1992 I began to include movement in my work, with a series of animations, made up from mathematical equations on surfaces. This work appeared as "Surfaces" in 1993, at the event "Linzer Notate," organized by poet Christian Steinbacher in the Austrian city of Linz. This phase of experiment with movement culminates with the video "Falésia" (literally "cliff"), dating from 1994, in which an element of sound also appears; "Falésia" is a journey made by way of three-dimensional visualization of a Sapphic strophe.

At the end of 1994 I came back to Brazil. The poem "*IO*" (1995) is my first experiment with interactivity.[4] The reader sets the poem off by making the spherical object move in one of four directions — up, down, left, right. At a given moment a transformation takes place: the object's texture changes, from opaque to transparent, to show the cylindrical penetration within the

4 It is constructed and animated with Strata StudioPro software and integrated with Macromedia Director.

sphere. This is accompanied by a sound background: the vocalization of "o" and "i," in reference to the opaque and transparent worlds respectively, and the vocalization of the diphthongs "io" and "oi" at the change from one texture to another. At certain moments, chosen at random by the program, quotations and commentaries appear in relationship to the various meanings of the word "IO" — Italian for "I," the sign for Input/Output, numerals "1" and "0" — and excerpts from Hölderlin's translation of Sophocles' "Antigone," in which "io" appears as a phonetic transposition of an ancient Greek interjection indicating pain and lamentation.



Images from the interactive poem "IO"

## Conclusion

Intelligent use of the increasingly sophisticated resources of multimedia for the creation of poetic works is an irresistible challenge. The computer is a stage for the integration of various different codes — visual, acoustic, numerical, etc. 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.

I believe that the concept of poem as an open diagram, when it incorporates the notions of plurality, interrelationship and reciprocity of codes, not only guarantees the viability of poetry in a society subject to constant technological revolution, but places it in a privileged position — that of the "universal progressive poetry" of Schlegel and the "*Dichtung + condensare*" of Pound. That is to say, *Poiésis*.

Ladislao Pablo Györi holds a degree in Electronic Engineering from the National Technological University of Buenos Aires, Argentina. He began his literary career in 1983 and his experimentation with computers in 1984. His book of poetry *Estiajes* (1988) was published in 1994 in Buenos Aires. In this book he used computers, information theory and probability calculus, in order to change the usual syntax and to postulate non-linearity as a compositional element. In 1994 he co-founded in Buenos Aires an interdisciplinary group called TEVAT. He is currently working on the production of virtual three-dimensional contructions and what he calls virtual poetry — three-dimensional visual poems with high entropy and visual content.

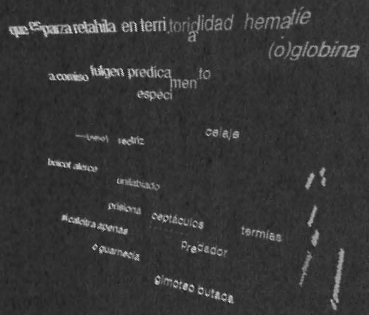
1427 Buenos Aires, Argentina
*Visible Language* 30:2
Ladislao Pablo Györi, 158-163



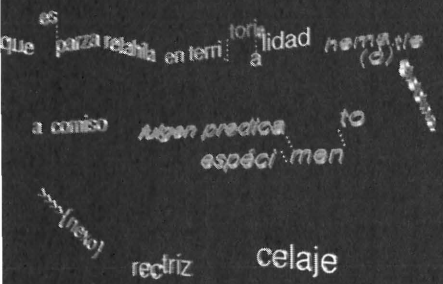
# Virtual Poetry

Ladislao Pablo Györi

In this manifesto the author proposes a new kind of poetry — virtual poetry — that exists only in electronic space and computer networks. This new poetry is interactive, animated, hyper-linked and navigational.




*VP12B - Convergence of three areas and start of movement.*



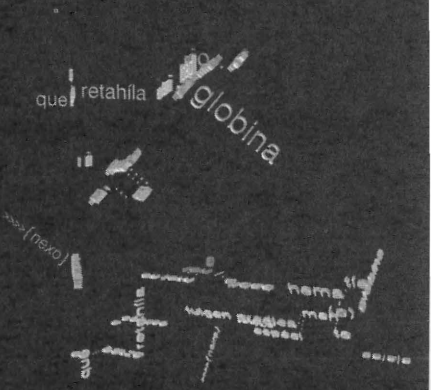

*VP12B- Area A separation and structural movement.*

Cyberspace, digital processing, telepresence,
multimedia, Internet, virtual reality,
computer animation, artificial reality, robotics,
expert systems, nanotechnology,
electronic photography, fiber optics,
three-dimensional sound, fractal geometry,
non-linear dynamics, chaos and complexity,
artificial life, fuzzy logic, neural networks,
genetic programming...and...
what about poetry?:
VIRTUAL POETRY!

Virtual poetry results from a basic need
to impel a new kind of creation
related to facts whose emergence —
for their morphological
and/or structural characteristics —
would be improbable in the natural context.
This new creation requires
a rational and constructive human action,
as well as the surpassing of
redundant events
which keep poetic production
in previously absorbed instances
and away from
new aesthetic functions.

Because of the essential conjuntion
between human creative work
and the utilization of electronic media,
which have enormously widened
the fields of poetry and art,
all the creative processes will progress into the
virtual space offered by the machine.
In it, and with the aid of adequate software,
signs can reach multiple proportions
by means of the application of functions
which go as far as to intrinsically
modify their usual properties,
to generate even unexpected systems
due to their radical configuration and behavior.

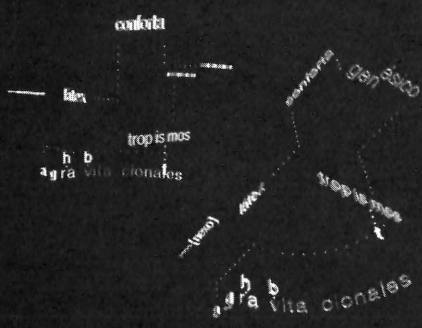
The application of computers has facilitated
not only the access to a custom-definable
logical or virtual space
(which ignores the coordinates defined in a
gravitational one, having no privileged direction
or immovable constraints),
but also to a large series
of algorithmic operations.
Fundamentally, it has inaugurated
an essentially different field,
for which it is necessary to produce
new languages which will give birth to
a new aesthetics.
Moreover, in connection with virtual reality,
and its extraordinary scope,
this proposal would avoid
the simple transposition
of already barren situations
supported by old codes
of other non-electronic systems.




*VP12B- Area A clonation and transformation.*

The digital world
(computerized, therefore synthetic),
that deeply differs from physical,
real or analogical facts,
exceeds their limitations
and the usual categories of experience,
forges its mastery
in the mathematic or numeric character
of the elements that are contained in it
and in the possibility
to openly establish correlations between
virtual space, objects and subjects,
as no previous medium has allowed.

Faced with this state of affairs,
we start from the innovations
developed by the latest constructivist vanguards
and from a philosophical and
epistemological context
in accordance with
the present advance of the sciences.
In this context, we must respond




*VP12B- Area C separation and transformation (two views).*

to the imperious need to
design the brand-new theoretic profiles
of this revolutionary technology
and the events technically consistent with
an n-dimensional virtual space — that is to say
— able to be created and treated in that space.

Thus, VIRTUAL POEMS or VPOEMS
are interactive digital entities, capable of:
1) taking part in or being generated within a virtual world
(here called "Virtual Poetry Domain" or VPD)
through software or routines
(for the development of virtual reality
applications and real-time explorations)
which confer diverse possibilities for
manipulation, navigation, behavior and
alternative properties
(in the presence of environmental constraints
and interactions), such as evolution,
sound emission, animated morphing, etc.;
2) being experienced by means of partially or
fully immersive interface devices
(vpoems support "walkthroughs" and "flybys");
3) assuming an aesthetic dimension
(in accordance with the semiotic and
entropic concept of information),
not reducing themselves to a simple
phenomenon of communication
(like a pure data stream); and
4) being defined as hypertext structures
(circulation of open and multiple
digital information)
but principally producing hyperdiscourses
(with a strong semantic non-linearity).

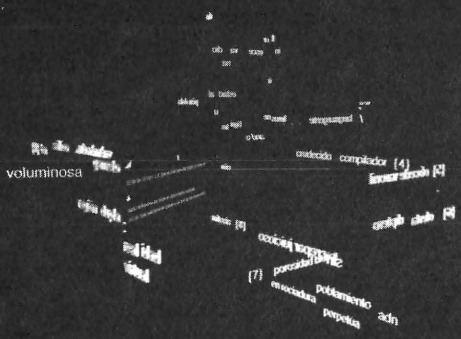
The VPD is a substitutive field
for the traditional printed page.
The printed page only establishes
a superficial and static contact;
it is very restricted in relation to the requirements of large versatility and global artificiality
that also dominate

contemporary poetic production,
and which will dominate those of the future.
Virtual Poetry Domains also exceed all the
more or less established techniques
of channeling of poetic messages, because
they break in a definitive way
with the first support that produces and maintains
them: real physical space.
Vpoems and the VPD have a logical existence.
They bear no resemblance to anything,
becoming entities with an actuating power
(related to the quantity of resources at work)
as has never been seen
or experimented with before.


*VP12B - Area A instance before linking with VP13 through "TORI0".*

The opening of the Virtual Poetry Domains
to computer networks will facilitate the realization
of virtual "teleportations" of subjects
to VP-based computers anywhere in the world.
Viewers will obtain an absolutely new remote
experience of simulated and exploratory
"reading." This is still difficult to value today in its
most extraordinary dimension and possibilities.

Virtual Poetry, as expounded here,
is not reduced to the surpassing of
certain linguistic codes, the adding of a topic,
some formal conquests,
another segmentation of a continuum,
the utilization of an unusual support —
however important these aspects may be.
Virtual Poetry forces the initiation
of a new era in the general poetic creation,
freeing the human imagination
from any real constraint,
and giving it a vast and virgin field.
In this new field, everything conceivable
(as a construct) can exist.
In the future,
human-machine experience
(as a mixed or cybernetic system) will
rise up to levels higher than all those already known.




*VP11's opening through successive linking from VP13B.*

John Cayley is a poet, literary translator and the founding editor of the Wellsweep Press, which, since 1988, has specialized in the publication of literary translation from Chinese. His background in humanities computing dates from 1978 when he undertook post-graduate work on linguistic analysis of classical Chinese style. His poetry and translations have appeared in numerous magazines, with major contributions to *Looking Out From Death: the new Chinese poetry of Duoduo* (London: Bloomsbury, 1989) and Gu Cheng, *Selected Poems: an authorized translation* (Hong Kong: Renditions, 1990). *Ink Bamboo*, a collection of poetry and translations, is forthcoming from Agenda Editions, London.

# Beyond Codexspace:

John Cayley

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*Visible Language* 30:3
John Cayley, 164-183



# Potentialities of Literary Cybertext

The application of cybertextual technologies to experimental poetics is the context for this brief exposition of my machine modulated literary work. I invoke theoretical issues of cybertext but these are not extensively explored. Instead, I raise issues crucial to the work described here — the role of (literary) text in cyberspace; silent reading in new visible language media; the confusions of computer as medium; the limitations of link-node hypertext; the shifting relationships between writer, reader *and* programmer; multi- and non-linear poetics; and the engagement of contemporary poetics with cybertext. The major part of the exposition then focuses on the work itself and certain of its future potentialities, with occasional reference to the more general, theoretical concerns.

## Beyond Codexspace: Potentialities of Literary Cybertext

John Cayley

The use and abuse of visible language — in the broadest sense — is undergoing huge, unprecedented growth at the current time. This growth is taking place in cyberspace, in what many critics might well have considered an environment hostile to cultivated "letters," hostile, at the very least, to the traditional and still pre-eminent delivery media which have made language visible. The narrow bandwidth of current networks, and the limited capabilities of affordable interfaces has meant that encoded text is the dominant medium of information exchange on computer-based networks. To communicate over these networks, people write and read. That is, they compose (literary) texts and publish them in cyberspace where they are read, usually in silence, by friends, colleagues and the more general, "wired" public. All this has stimulated the emergence of an exuberant mass of new forms and proto-genres of visible language: listserve mailing lists, online conferences or "chat" zones, MOO spaces and so on. The advent of the World Wide Web has extended and articulated networked literary production to include typographic and other design aspects of textuality. However, the vast majority of this visible language is not seen by its writers or readers as belonging to literary or artistic production in the canonical sense. Serious literary hypertext does exist and is practised increasingly in this context.[1] However, it is perhaps more significant, in cultural terms, that the new quasi-ephemeral forms of non-literary visual language are exerting an increasing influence on self-consciously literary production, in what might be characterized as the real-time realization of contemporary criticism's postmodern intertextual ideals.[2]

But this is a temporary state of affairs, a momentary window of opportunity for the partisans of visible language. When the bandwidth widens, when the audio-visual takes over from the keyboard and comes to dominate screen, printer, speaker and as yet undreamed of appliances and peripherals, a huge swathe of visible language-use will instantly migrate to non-literate

1 "Serious hypertext" is a rubric of Boston's Eastgate Systems, one of the major, self-consciously literary publishers in the field, and developers of their own hypertext authoring software, StorySpace. The Voyager Company has also made significant efforts to produce new work in new media as well as transpose appropriate content.

2 Various references: Landow, George P. 1992. *Hypertext: The Convergence of Contemporary Critical Theory and Technology.* Baltimore, Maryland: John Hopkins University Press. Bolter, Jay D. 1991. *Writing Space: The Computer, HyperText, and the History of Writing.* Hillsdale, New Jersey: L. Erlbaum Associates. Landow, G. P. editor. 1994. *Hyper/text/theory.* Baltimore, Maryland: John Hopkins University Press. Joyce, Michael. 1995. *Of two minds: hypertext pedagogy and poetics.* Ann Arbor: University of Michigan Press.

sound and vision. By the time this happens, will visible language have become an understood and established literary medium within the new technosphere? As engaged with cyberspace as it now is with "codexspace," for example? This is an underlying concern of the work I describe, the first of a small number of theoretical issues which I briefly outline as a context for this delineation of my own practice.

My cybertextual compositions are literary. They are designed to be published on computer-controlled systems linked to the now familiar peripherals of screen, keyboard and pointing device. First and foremost, these pieces are intended to be visually scanned on screen, silently read and interacted with through keyboard and pointing device. They subscribe to the notion of written language as a distinct, quasi-independent system of signification and meaning-creation. Its relationship to spoken language is structured but indeterminate as to detail, and is subject to continual contestation, depending on the nature and function of the language being created. When the issue of the survival of textual language-use into the audio-visual age was raised on a hypertext discussion list, I answered for its continuing creative role: "for the very reason that it is silent / because it allows the silent to speak / because it allows the dead to speak / because so many of our thoughts are silent, unspoken."[3] Literature which is engaged with the unique potentialities of computer-based networks is uniquely placed to serve as a link between the silent literary culture of the past and that of the future.

However, the new literature will not be "computer literature." There is a recurring popular confusion concerning the nature of the computer. It is not in itself a medium, neither a physical or a delivery medium, nor a content-bearing, artistic or cultural medium. What we idly call computer is always a system of hardware, software and peripherals, and this multiplicity is what may become, potentially, a medium; potentially because it is arguable that there must be agreement between producer/consumers about the use of a new medium before it can be recognized as such. Thus, link-node hypertext, especially as realized on computer networks, is a new, rapidly evolving textual medium, gaining wide acceptance. However, "computer poetry" is not a new medium, it is simply a misnomer. Neither is this a trivial

3 Posting to ht_lit@journal.biology.carleton.ca (server: subscribe@journal.biology.carleton.ca), March 28, 1995.

matter of terminology. It is important to make it clear that literary developments in cybertext are not constrained by hardware technologies themselves; they are constrained only by software, which is an *authored* delivery medium. Apart from these constraints which are surmountable through engineering, there are those produced by, as it were, a false consciousness generated by the ideology surrounding the current use of computer-based systems.

For example, we still expect our systems, our new media, to produce forms which are stable, closed. Hypertext in its most familiar link-node manifestation is limited and sometimes self-limiting. There are developers and authors of hypertext who argue that despite these limitations, the medium has opened up huge spaces of unexplored potential for creative activity. Thus, it is time to recognize a new medium, define and accept its limits, and so proceed to exploit the space it has marked out. Unfortunately for this view, the computer, the underlying hardware on which hypertext systems are realized, does not have fixed functionality and is increasingly easy to reprogram. Thus, for example, as a poetic writer with fairly extensive (but far from professional) programming skills, I can break through the boundaries of link-node hypertext with relative ease. The forms of both delivery and artistic media change under my fingertips and before your eyes, allowing, for example, greater reader-interaction with the work than is typical of most hypertext. This introduces a new element into the critical understanding and assessment of new literary objects. We must begin to make judgments about the composition of their *structure* — to assess, for example, the structural design or composition of the *procedures* which generate literary objects — not only the objects themselves. The poet must come to be judged as a sometime engineer of software, a creator of forms which manipulate the language that is his or her stock-in-trade in new ways. This is crucial to criticism, but it also has immediate practical consequences, because a general problem with hypertext is finding your way through it, or rather doing so in a way which is meaningful and enriching. While the poetics of linear paper-based text has been extensively explored, the multi- or non-linear, generalized poetics of texts composed and structured in cyberspace has a long way to go.[4]

Multi- and non-linear poetics is a recurring theme in my work for other, more contingent reasons and is one of the concerns

4 A generalized non-linear poetics is one of the central concerns of the hypertext poet, Jim Rosenberg. See his introductory essay in Jim Rosenberg. 1993. *Intergrams.* Boston. Massachusetts: Eastgate Systems, published as part of *The Eastgate Quarterly Review of Hypertext,* 1:1. Recently he has also posted a draft discussion of these issues to ht_lit (note 3 above), March 26, 1995.

which originally inspired my move into machine modulated writing. As a trained sinologist who did research on parallelism in Chinese prose and poetry, I was well aware of non-linear rhetorical techniques in writing. The computer's programmable screen offers the possibility of representing such tropes and figures directly, and the development of writing for new hypertextual media should also lead to the development and better understanding of non-linear poetics generally.

Finally, there is a question that is more purely a matter of content: the engagement of writers using these new, potential media with contemporary poetic practice (and with writing practice more generally). Few writers who are established in traditional literary media are engaged with the emergent forms and many new writers who are exploring those forms are insufficiently aware of relevant past experimentation, of the huge corpus of highly sophisticated writing which already exists, and against which any literary production — embracing all media — must be judged. I speak chiefly to the field of poetic literature, to encourage deeper engagement of the world of letters with the ocean of potential literary outlawry.[5]

## Scoring the Spelt Air

My own first explorations of machine modulated poetics began in the mid 1970s when personal computers first became widely available. It is clear that the computer's programmable screen provides a way of "scoring" the presentation of literary compositions which are intended to be read silently. Within a relatively simple authoring harness, the writer has the possibility of presenting the words of a text according to the rhythms of his or her inner ear, in terms of the speed at which words appear on the screen, the positions in which they appear, the pauses between them and between phrases or lines, etc. There is also the possibility of exploring dynamically (in real time), non-linear aspects of a poem's rhetorical structures, by scoring its component words and phrases in alternate orders designed to highlight such structures. The most finished result of these investigations is the piece, *wine flying: non-linear explorations of a classical Chinese quatrain* (*figure 1*).[6] A collection of techniques for this scoring approach to poetic presentations on programmable machines is a software harness for developing such work, a still uncompleted project, with the general title, *Scoring the Spelt Air*.[7]

5 Potential Literary Outlawry or PoLiOu: potentially, a name for a broad range of experimental literary activities which are engaged with their own representation in cyberspace and with the particular capabilities which this new form of representation may offer. Clearly, the name makes explicit acknowledge- ment to both the anticipatory plagiarisms and the anticipated antagonisms of the OuLiPo (see note 25).

6 Cayley, John. 1988. *wine flying*. London: Wellsweep. *wine flying* was first programmed on a BBC microcomputer in 1983–84. In 1988, it was ported to the Macintosh and HyperCard, which then became my preferred development environment for this kind of work.

7 The project is uncompleted in the sense that the authoring harness has not been prepared for publication, although I have used it for individual works such as *wine flying*. This points to the question of the cybertextual author's engagement in the creation of forms themselves and how this relates to the completed work. At the present time, most of the software forms I make are intimately related to the corresponding finished works, but I can also see that, particularly in the case of non-generative work such as *Scoring the Spelt Air*, the form could easily be detached from any specific content.

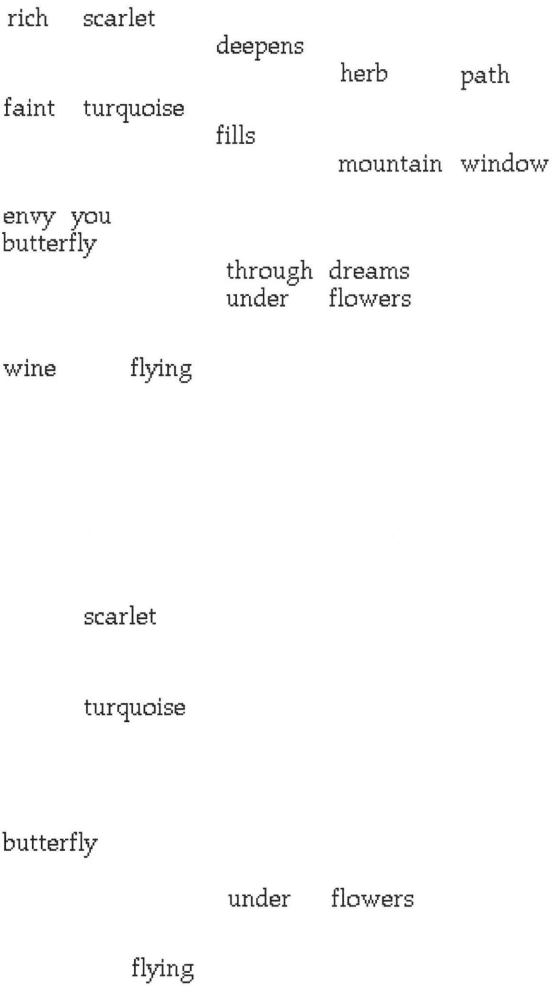



**Figure 1** Two screen shots from *wine flying* showing the entire text of the translation of the quatrain by Qian Qi (AD ? 722–80) and a screen showing first fragment of an alternative "path" through the poem. The words in this fragment were displayed in the order: "turquoise butterfly flying under scarlet flowers."

However, text manipulation and generation by machine seemed to me, from the outset, to provide richer potentialities. When a friend wrote me a personal letter at about this time, coded into the acrostic letters of twenty-six words, one for each letter of the alphabet, I immediately set out to program such a simple, and potentially poetic encoding technique.[8] At about the same time, I produced various text randomizers: experimenting with disordered text at different linguistic levels — sentence, clause, phrase, syllable, grapheme, etc. — and comparing the results. Another important theme underlying this and my subsequent work emerged in the process: an interest in the effects of

8 The writer of the letter was Humphrey McFall, whom it is a pleasure to acknowledge.

procedural techniques on closely written "given" texts; a testing and re-testing of the hypothesis that such texts seem to retain the tenor of their meaning-creation even after having been subjected to such transformations, so long as readers of the transformed piece are prepared or prompted to involve themselves actively in the reading process.

All of the work which followed involves the use of some form of semi-aleatory text-generation procedure. These rule-governed procedures are applied to a given text when a reader selects its title from a contents page. The selected piece is then "read" or "performed" by the procedure(s) in a series of screens of animated text. Because of the aleatory factor(s) working within the procedural rules every performance is unique; every reading is different and demands the active involvement of the reader.

I use conventional link-node structures only for the explanatory pages/screens of each work. The generational structures at the heart of the work *could* be mapped onto a link-node model having separate lexia for each word of the underlying given text(s) and with links generated 'on the fly' by the object's generational procedures.[9] This amounts to one potential realization of the "hypertext *within* the sentence and *within* the word" which the hypertext poet, Jim Rosenberg, has repeatedly called for, and realized himself in widely different ways.[10] However, the usefulness of the link-node model is highly questionable when approaching literary objects such as those developed by Rosenberg and myself.

9 "Lexia" is a term adopted by George Landow to indicate the unit of text at either end of a hypertext link.

10 "I am on record as advocating taking hypertext into the fine structure of language, thereby fragmenting the lexia ..." "Notes toward a non-linear prosody of space," Jim Rosenberg, posting to the ht_lit discussion list (note 3), March 26, 1995; or in a later posting elsewhere, "... my own interest [is] in using hypertext to carry the infrastructure of language itself ..." October 28, 1995.

## Indra's Net

It was only in the late 1980s that the technology to present the results of such work in an appropriately designed format became widely enough available to qualify as, at least, a potential medium of publication.[11] It was at this time that I produced the first published piece in a new medium of my own making, *Indra's Net*, a title which I used for this piece and also for the series of works which have followed from it.[12]

11 I first gained regular access to a Macintosh computer with HyperCard in 1988, as noted above.

12 Cayley, John. 1991-93. *Indra's Net I*. London: Wellsweep. Details of the other publications in the series will be given as they are first mentioned in the text. All are HyperCard 2.x stacks which are published on disk or over the Internet, currently for Macintosh computers only.

Indra's Net was one of two metaphors which guided the inception and development of this cybertextual project. The concept of *Indra's Net* originates in Hinduism. The net was made of jewels and hung in the palace of the god Indra, a generative representation of the structure of the universe. I first encountered it in a history of Chinese Buddhism: "a network of jewels that not only reflect the images in every other jewel, but also the multiple images in the others."[13] As a metaphor of universal structure, it was used by the Chinese Huayan Buddhists to exemplify the "interpenetration and mutual identification" of underlying substance and specific forms. In my own work it refers to the identification of underlying linguistic structures which are used to restructure given texts recursively, and so to postulate and demonstrate these structures' generative literary potential; or, on a more grandiose scale, to represent some of the underlying principles of meaning-creation within language itself, those which generate new language in the same way that the universe may be seen to be formed by the falling and swerving atoms of Lucretius.[14]

The other metaphor which helps to structure my work is taken from holography. The neologism, "hologography," is based on the definition of "hologram" in the *Shorter Oxford English Dictionary*: "A pattern produced when light (or other radiation) reflected, diffracted, or transmitted by an object placed in a coherent beam (e.g., from a laser) is allowed to interfere with the undiffracted beam; a photographic plate or film containing such a pattern." This is transposed from light into language: "A pattern of language produced when the words or the orders of words in 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 rules, a machine or a computer program which defines or displays such a pattern."

The first Indra's nets were acrostic. *Indra's Net: I* is a sampler of this early work and the terminology used to describe it. I should say at the outset that when I first developed this work, I was ignorant of the earlier or coincidental experiments of Emmett Williams and Jackson Mac Low. John Cage's mesostics were also then unknown to me.[15] William's "ultimate poetry," Mac Low's "Asymmetries" and later, his "diastic" techniques are very similar to what I first termed

13 Ch'en, Kenneth. 1964. *Buddhism in China: A Historical Survey.* Princeton, New Jersey: Princeton University Press, 317.

14 "But the fact that the mind itself has no internal necessity to determine its every act and compel it to suffer in helpless passivity — this is due to the slight swerve of the atoms at no determinate time or place." Lucretius, *The Nature of the Universe*, Book 2, translated by R. E. Latham (Harmondsworth: Penguin, 1951), 68. The swerve or "clinamen" of Lucretius is also a major reference point for the OuLiPo (see note 25), even though the workshop is, generally, suspicious of the aleatory.

15 See, especially: Emmett Williams, *A Valentine for Noël: Four Variations on a Scheme* (Barton, Brownington, Berlin: Something Else Press, 1973) and also his 1975. *Selected Shorter Poems (1950-1970)* New York: New Directions. A selection of Jackson Mac Low's Asymmetries is included in his 1986. *Representative Works: 1938–1985* . New York: Roof Books. His "diastic" technique was used in 1985. *The Virginia Woolf Poems* . Providence, Rhode Island: Burning Deck. See also note 24 below. Cage's mesostics include *Roaratorio: An Irish Circus on Finnegan's Wake* (first produced in Paris in 1978) and *I-VI* . 1990. Cambridge, Massachusetts: Harvard University Press. For interesting discussion of these works, see Marjorie Perloff. 1991. *Radical Artifice.* Chicago and London: University of Chicago Press, especially chapters 5 and 7.

"head- or internal-acrostic hologography."[16] However, there are non-trivial differences between all this work and my own which arise from its method of publication, or more precisely the digital instantiation of my work, which allows such generative procedures to be experienced by the reader in real time, as the text is generated, and not after the author has produced and recorded the new text. The procedures thus move closer to the reader, and surely a major component of the appreciation of such work is the reader's potential understanding of what is going on and how it's being done. Beyond a real-time experience, the programmable screen allows further intimacy with the process, once a composer has developed meaningful ways for the reader to interact with or even alter the procedures themselves. Moreover, any aleatory or "chance operation" aspect of such work is only *fully* realized in a publication medium which actually displays immediate results of the aleatory procedure(s). Such works should, theoretically, never be the same from one reading to the next (except by extraordinary chance). Mac Low has preserved and published the effects of chance operations through a commitment to the performance of his pieces; software allows these effects to be carried over into the world of silent reading.

*Indra's Net I* contains examples of several "free internal-acrostic hologograms," one "strict or head-acrostic hologogram," one "26-word-story head-acrostic hologogram" and both hologographic and non-hologographic "etymoglossological Indra's Nets." The latter involve semi-automatic transformations of words from a given text into expanded glosses based on etymologies and associations of words. I will not discuss them further here because they have not yet been developed as have the acrostic and collocational pieces.[17] Neither will I detail the "strict" and "26-six-word story or sentence" forms, for similar reasons.[18] Instead I shall outline what I now call the "mesostic hologogram."

The implication of applying the word "hologogram" to a text is that it is generated from material which is contained within itself.[19] The given text is seen as a succession of the twenty-six roman letters, ignoring punctuation, etc. The transformation may begin at any point in the given text. Each letter is, in turn, replaced by any word from the given text which con-

16 It would be interesting to make a catalogue of the precise varieties of *generative* acrostic and mesostic procedures, noting their differences; although this is far beyond the scope of this paper.

17 This technique bears certain similarities to those developed by Stefan Themerson and set out in 1975. *On Semantic Poetry*. London: Gaberbocchus Press. Further details of a number of other potential and (in *Indra's Net*) as yet unrealized forms can be found in the explanatory material in *Indra's Net I-III*. These include further etymological and glossological hologograms; phonemic hologograms (which would generate a form of sound poetry) and morphemic hologograms (which I will eventually explore since they would provide a way of engaging a language like Chinese). A forthcoming commission will investigate mesostic transformations from original to translation (in another alphabetic script) and back again.

18 This 26-word form is similar to Williams's "ultimate poetry" except that in my strict form I try to make a 26-word sentence or narrative (in the traditional order of the letters). An aspect of this form which I cannot resist mentioning is that once, like Williams, Mac Low or myself, you have mapped the 26 letters of the alphabet onto 26 words, it is theoretically possible to encode all of literature acrostically or mesostically — translating everything into a "surface language" of 26 meaning-tokens (with no loss of information). Perhaps alphabetization was once perceived like this, as early scribes moved away from morphemic script elements — as if "book" seemed to present itself as: "house + eye + eye + palm-of-the-hand."

tains the letter being replaced. This kind of hologogram is unlikely to produce anything resembling natural English. Its primary transformational rule is based on arbitrary elements of the script (itself already at one remove from language as a whole) and is, on the face of it, unrelated to any significant aspect of grammar or rhetoric. On the other hand, the notion that words which share letters may, by this token, share something more, is perhaps worth poetic attention. Moreover, the given text may

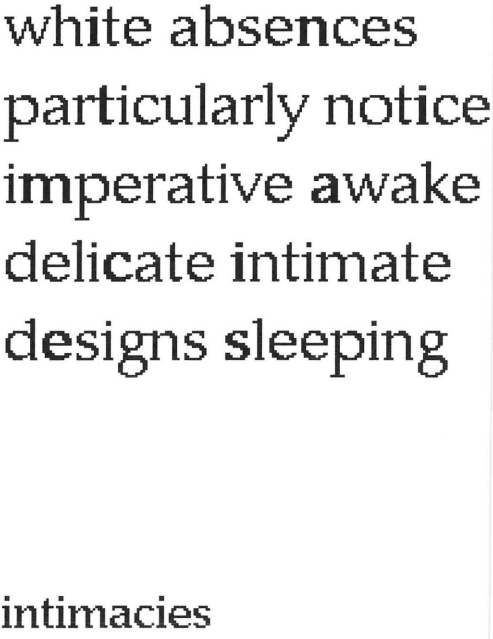



**Figure 2** Screen shot from "Under it all." This is the version of the piece as it appears in *Moods & Conjunctions: Indra's Net III.*

be adapted or composed with an eye to the transformation which is to be imposed upon it. This was undertaken in the case of "Under it All II," the central piece of *Indra's Net I* (*figure 2*). As far as possible all of its nouns are plurals and all verbs agree with the third person plural. This means that new, derived phrases are more likely to be natural collocations.

19 Oscar Pastior in his *Poempoems* (first published in German in 1973) has a more poetic and less formalist approach to such a self-referentiality: "... holography ... to make a text as far as possible such that every part contains the whole. That is an image I hold in front of me." Oscar Pastior. 1991. *Poempoems* . London: Atlas Press; first publication of Pastior's work in English, as part *of The Printed Head* series, 1:5. Eduardo Kac is another early explorer of the application of holography to literature and vice versa. See his first holopoem (with Fernando Catta-Preta), HOLO/OLHO (1983), and his remarks in "Holopoetry and Fractal Holopoetry." *Leonardo*, 22: 3/ 4, "Holo/Olho (Holo/Eye) ... is a combination of anagrams in which the word holo mirrors olho and vice-versa. The mirroring effect, however, was conceived so that fragments of the poem would contain enough letters to form the entire meaning: both holo and eye. The arrangement of letters in space was holographed five times; each hologram was fragmented and the five holograms were reassembled in a new visual unit. This holopoem was an attempt to recreate, in its own syntax, a structure that would correspond to the holographic model, according to which the information of the whole is contained in the part and vice-versa (399) ."

An advantage of using software to produce this kind of work is the relative speed at which texts can be generated, allowing an experimental phase in the process of composition, with the results of earlier experiments fed back into the finished publication. The development of the Indra's Net project generally, has been just such a process.

**Indra's Net and visual poetry**

Mesostic work is inherently visual, in the sense that textual choices are based on the identity of graphs in the written form of the language. Moreover, early on, it became apparent that this type of text generation implied a structure that could be represented in three (or more) dimensions. The flexibility of typography on the computer screen allows the instantaneous production of typographical effects which would be very difficult to reproduce on paper. A simple example is the use of emboldening to highlight the letters of the word(s) of the *underlying* given text after a mesostic transformation has been applied. From the collection, *Collocations: Indra's Net II* this emboldening is applied to letters on the screens, as they are generated (*figure 2*).[20] A special rendition of *Golden Lion* was also published in paper form in what is a piece of visual poetry in fine printing, as well as a snapshot of cybertext.[21]

It is possible to conceive of more than one implicit three-dimensional space defined by (twenty-six) planes of words which share the same letter. One of these is represented on the cover of a paper publication which accompanies *Collocations*.[22] Later I produced a poster poem of the entire text of "Under it All" in which tone was used to imply this three-dimensional arrangement of words (*figure 3*). Each letter of the alphabet is assigned a particular weight of tone — a the lightest, z the darkest — placing it, visually, on a separate plane at a particular distance from the viewer. Each word from the text is printed in the tone which

20 Cayley, John. 1993. *Collocations: Indra's Net II.* London: Wellsweep.

21 Cayley, John. 1995. *An Essay on the GOLDEN LION: Han-Shan in Indra's Net.* Edinburgh: Morning Star Publications. See the discussion of *Golden Lion* below.

22 Cayley, John. 1993. *Under it All: texts, hologography, afterword.* London: Many Press. This little book was published in an edition of 221 copies, each of which was unique. Four separately prepared pages bound into each copy consist of unique samples from two hologographic transformations.

winds rains waking how many petals must have fallen silent sleeping forms points on blank white canvases all possible curves problems far beyond our artists capacities to resolve consider these our small children who awake see their sleeping parents doors ajar enter their rooms bright warm summers mornings all coverings abandoned except these sheets which trail their sculpted folds over partially concealed limbs and lie beneath white sheets whose pure brilliancies children particularly notice their parents barely sleep enjoy still teasing promises of deeper slumbers return our children know their parents now are dimly conscious of days approach notice underlying sheets once more plain white completely silent tender relations of bodies lying which children believe they fully understand they long to express perfectly follow lines linking these bodies then draw their parents intimacies towards themselves but see sheets infuriating pure white absences feel everything so still our children forget ignore lines points on linen canvases know nothing of bodies curves intimate designs sleeping forms are painfully aware even were they able to hold in mind draw these forms towards their hearts eyes hands still too young too inexperienced to follow lines of intimacies they pursue children artists with their own unique imperative visions committed to their most perfect realizations what can our children do they need methods processes techniques children jump into beds between upon their parents pummel with shrill words tiny fists limbs twist flail make demands hairs pulled tangled gentle bruises taunts scratches endless demands somewhere scant traces delicate structures remain dreams slip away their parents attempt to smooth refashion frayed crumpled forms lines so many so delicate once so finely drawn these alone remain white sheets beneath above affections storms break threads split lines shear successive gales all these which slip away with dreams gather lines forms show through within against their tender tempests tattered destroyed returned to days lights winds rains waking how many petals must have fallen

**Figure 3** Scaled-down, monochrome version of the "three dimensional" poster poem of "Under it All."

corresponds with that assigned to one of its constituent letters, according to simple rules intended to distribute and use up all of the twenty-six tones. Such representations could be animated and translated for the computer screen or a computer-controlled installation.[23]

## Collocations

Results of the experimentation with the collection of pieces in *Indra's Net I* indicated two principles for further development: (re)composition of given texts in preparation for procedural transformation, and composition, through software engineering, of the procedures themselves.

*Collocations: Indra's Net II* contains the first publication of a collocational procedure which is simple, extensible and rich in generative potential.[24] It was originally devised as a way of enhancing the syntactic naturalism of the mesostic pieces by restricting, where possible, the collocations (syntactic linking of words, here in simple pairs) generated by mesostic pieces to collocations which occur in natural English, specifically the given text(s). Thus, once the primary mesostic rule is satisfied, if it is possible to find a word from the given text which collocates with (follows) the last word chosen by the transformation, then this is always selected. The version of "Under it All" included in the *Collocations* suite exemplifies this double procedure (*figure 2*).

However, *Collocations* also includes the first collocational procedure applied to a text without prior mesostic transformation, the piece, "Critical Theory" (*figure 4*). This tranformation can

23 An animated version for HyperCard is in the works, and there is a plan for an installation to project words onto mesostic planes, realized as a set of 26 transparent screens hung to suggest a large cubic word space. Read from its front through the 26 layers, fragments of a given text would be legible as the text was generated and projected words onto the planes. But moving around the cube, other meso-stically-deter-mined orders of words would present themselves.

proceed beginning with any word in the given text, which we then may call "the word last chosen." Any other word — occurring at any point in the base text — which follows (collocates with) the word last chosen may then follow it and so become in turn the word last chosen.

Clearly, in this type of transformation, at the very least, each pair of successive words are two-word segments of natural English. However, the text will wander within itself, branching at any point where a word that is repeated in the base text is chosen, and this will most often occur when common, grammatical words are encountered.

**Figure 4** Screen shot from "Critical Theory" in *Collocations: Indra's Net II.*

dim minimal abstraction
they welcome the eye a
tableau but insist on a
temptation to make

*Collocations* also includes a sampler of earlier work and one essay in another transformational algorithm, which is based on suggestions of Harry Mathews.[25] In one of these accompanying pieces, a mesostic abecedarian sentence of twenty-six words — containing the letters a to z in turn — is extracted from the given text of "Under it All." The sentence is difficult to construe. It is used to transform, mesostically, first itself, and then the text of "Under it All" and then "all literature."[26] Mathew's advice is indicated to attempt to construe the sentence. Synonyms are gathered for all its words and then the system is allowed to follow the syntax of the sentence, picking the gathered synonyms in place of the original words. This transformation could be developed much further.

24 Here, a line of similar and in some respects, parallel work (which did not directly influence my own until recently) runs from the text-scrambling program "Travesty" by Joseph O'Rourke and Hugh Kenner, intersecting with Mac Low at the point of his *Mertzegedichte: in memoriam Kurt Schwitters, February 1987–September 1989.* (Barrytown, New York: Station Hill, n.d. [1994]). During the composition of his *Merzgedichte* in mid-1989 Charles O. Hartman sent Mac Low several computer programs including "Diatext" and "Diatex4." He also started to make use of Hugh Kenner and Joseph O'Rourke's "pseudo-text-generating" program "Travesty" at about this time, to create some of the poems. However, "All out-puts were subject to rule-guided editing." (Sleeve notes for the audio CD, *Open Secrets* (New York: XI, Experimental Intermedia Foundation, n.d. [1994]).

25 Mathews, a member of the OuLiPo, outlines his version of the procedure in 1988. *20 Lines a Day.* Elmwood Park: Dalkey Archive Press, 90. The OuLiPo, or Ouvroir de Littérature Potential, is clearly a basic reference point for cybertextual developments given the workshop's profound and ludic investigations of the relationship between mathematics and literature, constrictive form, combinatory literature etc. See, as an introduction: Warren F. Motte Jr. editor 1986. *OuLiPo: A Primer of Potential Literature.* Lincoln and London: University of Nebraska Press. However, the OuLiPo has, at best, an ambiguous attitude to the aleatory as an aspect of generational, constrictive or combinatory procedure.

26 See note 18 above.

## Moods and conjunctions

The following three works in the Indra's Net series, *Moods & Conjunctions*, *Golden Lion* and *Leaving the City*, do not introduce significant innovations in the technology of the form, that is, in the delivery medium itself. Instead they fill examples of existing forms with content. Content is offered up to the generative algorithms in a slightly different way in all three works, however, since they all set out from *multiple* given texts. The texts may be blended together in the generational process, or one given text may be transformed in terms of another. Although the content of these works is composed and selected as appropriate to the new potential medium, their significance, in so far as this is conceded by their readers, lies in that *formed content*. This is an important point to recall. In the world of new media there is constantly the necessity to remind ourselves that novel literary technologies are not, ultimately, developed for their own sake. The works they generate or simply frame must be judged in the context of literature as a whole, as works inscribed as content-in-form.

"Moods & Conjunctions" is the title piece of *Indra's Net III*.[27] "Moods" consists of two texts about sex and one about language. One of the two pieces on sex is simply composed of fragmentary clauses made from 1) the pronouns I, you and we, 2) the modal auxiliaries and 3) selected adverbial and interrogative conjunctions ("then" has also been allowed). The collocational procedure is applied to all three pieces, such that phrases from one text continue with words from the others. The piece will vary its style and tone considerably. In particular the modal given text has a completely different tone which disrupts the expository prose of the other two given texts as the piece progresses.

Before *Moods & Conjunctions*, reader interaction with procedures and pieces was restricted to exploring explanatory - pages, selecting pieces to be generated and the ability to interrupt a piece and set it going at a new point in a particular reading. From "Moods," new ways of interacting were introduced, allowing greater reader involvement with the generation of text. Pieces in *Moods* allow the reader to increase or decrease the likelihood of a collocational jump taking place (e.g., from one occurrence of the word "and" in a text to

27 Cayley, John. 1993–94. *Moods & Conjunctions: Indra's Net III*. London: Wellsweep.

another). By moving a pointing device attached to the computer as text is being generated, the aleatory weighting is changed. The further to the left the pointer is moved, the more likely the scripts are to force a collocational jump. As the pointer is moved to the right such jumps become less likely. If it is moved to the extreme right, no jumps are allowed, effectively reading through the given text(s) in a normal linear fashion.

*Golden Lion*, is based on two given texts.[28] "Han-Shan in Indra's Net" is a short original poem. The second text, "An Essay on the Golden Lion," is the translation and adaptation of a prose work by the Chinese Buddhist monk, Fazang (AD 643-712). "Golden Lion" is a mesostic transformation with collocational constraints (as described above), but here the letters of the poems are transformed, one by one, into words of the essay. In the display, a half line of the poem is shown on the bottom of the screen, with words from the essay above, showing the poem's letters emboldened (*figure 5*). The effect is to produce a commentary on the poem in the words of the essay, where the commentary has the poem itself embedded within.

**Figure 5** Screen shot from *Golden Lion: Indra's Net IV.*

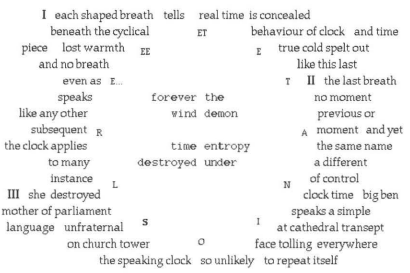
multiplying everything casting
everything existence in from one
moment to another infinitude and
so produces greater perfection
everything is substance endlessly
multiplying with content integral
lion the

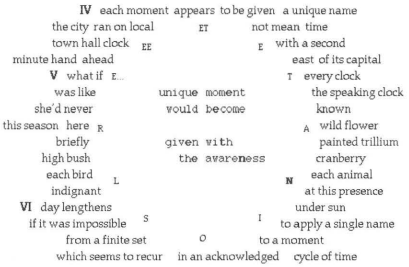
Leave me the space between

28 Cayley, John. 1994. *Golden Lion: Indra's Net IV.* London: Wellsweep.

*Leaving the City* takes two distinct given texts and blends them using the collocational transformation.[29] One text is a long translation from a talk on poetry and language given by the Chinese poet, Gu Cheng (1956–1993), at the School of Oriental and African Studies, University of London, in 1992. The other text is a shorter piece which attempts to come to terms with the brutal events which ended the lives of both Gu Cheng and his wife, Xie Ye on 8 October 1993.

While developing these three works, it became clear that it would be possible to do two new things with the texts as they were generated, allowing much greater reader interaction. Each time these pieces are read on screen, they are different because of the chance operations. However, it is relatively easy to allow the reader to collect phrases or lines of generated text. This allows them to produce a third kind of text, (similar to the edited cut-ups of earlier writers like Burroughs and Gysin), not composed by anyone, but selected and arranged.[30] However, the cybertextual system also allows the selected phrases to be *added* to the given text, thus augmenting the possible collocations that may be picked by the procedure in subsequent text generation. The procedure "learns" new collocations and alters itself. The reader's copy of the work becomes unique, different from every other copy. These potentialities were realized and published in the next Indra's Net, *Book Unbound*.




## Book unbound

When you open *Book Unbound*, you change it.[31] New collocations of words and phrases are generated from its given text according to the collocational procedure. After the screen fills, the reader is invited to select a phrase from the generated text by clicking on the first

29 Cayley, John. 1995a. *Leaving the City: Indra's Net V*. London: Wellsweep.

30 William Burroughs and Brion Gysin. 1960. *The Exterminator*. San Francisco: Auerhahn Press. Sinclair Beiles, William Burroughs, Gregory Corso and Brion Gysin. 1960. *Minutes to Go*. Paris: Two Cities Editions.

31 Cayley, John. 1995b. *Book Unbound: Indra's Net VI*. London: Wellsweep. *Book Unbound* was also included in the CD ROM issue, number 3, of the arts magazine, *Engaged*. London, 1995.

and the last of a string of words. These selections are collected on the page of the book named "leaf," where they are accessible to copying or editing. They also become a part of the store of potential collocations from which the book goes on to generate new text. The selections feed back into the process and change it *irreversibly*. If the reader continues to read and select over many sessions, the preferred collocations may eventually dominate the process. The work may then reach a state of chaotic stability, strangely attracted to one particular modulated reading of its original seed text.

## The speaking clock

The recently completed *Speaking Clock*, is a mesostic piece which tells the time. It acknowledges Emmett Williams's "Poetry Clock" and the mechanical "Word Clocks" of John Christie, but this digital clock tells the 'real time' in language, by performing a mesostic transformation on a 365 word given text. The words are arranged around the clock face on four screens. The digits 1 to 9 are mapped to the most common letters in the given text as "etanioslr." The date in the form "mm/dd" is shown with time in the form "hh/mm," by choosing words from the given text which contain the "digit letters" and embold- ening these letters on the screen. The digit letters are arranged around the clock face to indicate the simple mapping of letters to numbers and one of the clock face positions will be emboldened to show (roughly) the seconds after each minute. Zero is represented by a word with no bold letter. A ludic piece, with at least one serious point to make about the language of time, it has shown itself to produce some richly evocative phrases (*figure 6 a–d*).[32]


**Figure 6** Four seasonal screen shots from *The Speaking Clock* show the times: a) 12:11, b) 12:14, c) 12:20 and d) 12:26, all on 1 November, 1995.

32 Cayley, John. 1995c. *The Speaking Clock: Indra's Net VII*. London: Wellsweep. "Real time is concealed beneath the cyclical behaviour of clock and time piece. No moment is like any other ... and yet the [traditional] clock applies the same 'name' to many a different instance." *The Speaking Clock* affects to give a unique name to every moment.

## (Plastic) literary objects

While, in terms of reader interactivity and constructive, automatic generation of text and intertext, *The Speaking Clock* might seem a retrograde step, in terms of its presentation as a self-explanatory work, I feel it takes a step forward towards current work in progress. The poem as a form, despite the wide range of potentialities on offer in the world of contemporary poetics, is recognizable as such. It is framed by various conventions of publication but, even outside these conventions, it requires little explanation before it is recognized for what it is, leaving aside the question of its readability. On the other hand, in the current state of development, the cyber- textual object pretends to require a great deal of supporting explanatory text. This is perhaps inevitable, in the same way that we might have been overly fascinated by the technicalities of cameras and projection devices during the early history of the cinema, and since there is no escaping the requirement to write sets of instructions for using relatively unfamiliar machines.

However, hypertext systems are now, arguably, familiar enough to allow for the creation of cybertextual objects designed to subsist and operate without extensive explanatory framing. Hence the *(Plastic) Literary Objects*, which will be a series of literary applications, run on a computer in the way other applications and programs are run. They will generate text if left to their own devices and also respond to any of the recognized events produced by the standard peripherals of today's computer systems, chiefly keyboards and pointing devices. They will shift their textual modulation from one type of transformation to another. They will learn — selectively — altering their content and also the processes of textual modulation in response to reader interaction. They will be designed as forms which can be easily filled with new textual content which may be composed or selected by their readers, who will thus become co-authors, in the form, of new (Plastic) Literary Objects.

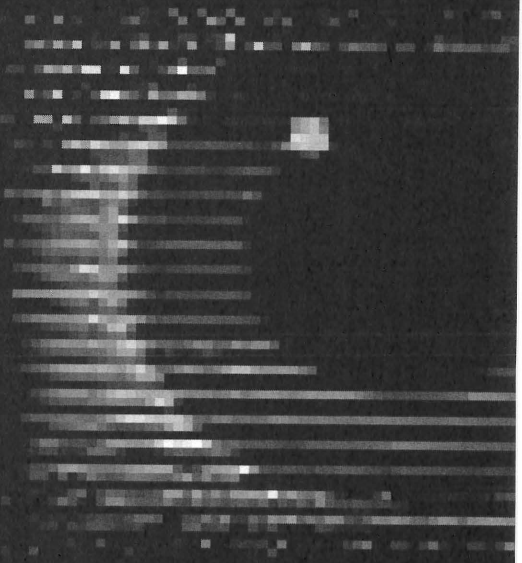
There is no obvious way to conclude such a presentation of a body of work. The question of the work's value has been bracketed in order that its formal engagement with experimental poetics and technological innovation remains the focus of attention, and because it is somewhat easier for a

writer to discuss the formal aspects of his or her work — without prejudice. However, the narrow formal attention that is a function of the exploration of new media must ultimately broaden and engage with wider critical perspectives. Programming is intimate with composition in all of this work. Its content-as-form is inherently protean, in a way that corresponds with the shape-shifting, multi-functional qualities of computer-based systems generally. It points to an area of potential literature which is radically indeterminate (not simply the product of chance operations); which has some of the qualities of performance (without departing from the silence of reading); and in which readers can extend the usual interpretative relationship with a text by exploring, configuring and even permanently adding to the literary objects of their attention.[33] This not only takes us beyond the bounds of the codex, but subverts the links and lexia of hypertext, leaving us to explore the indeterminate, unbounded literary potential of cybertext.

33 I owe this characterization in part to Espen Aarseth, who in "Text, Hypertext or Cybertext: a typology of textual modes using correspondence analysis" (forthcoming *in Research in Humanities Computing*, 6, edited by Susan Hockey, Nancy Ide and Giorgio Perissinotto, Oxford: Oxford University Press), has developed a (media independent) "generalized model with a few broad categories that can describe the main differences of textual phenomena." He argues convincingly for a distinction between cybertext and hypertext, putting forward the former as an inclusive term embracing, for example, indeterminate or reader-constructed texts, and reserving hypertext for (passively) linked structures of static lexia (textual nodes).

Eduardo Kac is a writer and artist who works with electronic and photonic media. A member of the Editorial Board of the journal *Leonardo*, he has published articles and essays in several languages on innovative poetry and visual art in several books and journals. He has works in several international public and private collections, and has exhibited his work widely. In 1995 he received the highest international award in the field of holography, the Shearwater Foundation Award, for his invention and development of holopoetry.

## Eduardo Kac



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*Visible Language*, 30:3
Eduardo Kac, 184-213



# Holopoetry

This essay discusses a new poetic language invented by the author in 1983 based on innovative use of the holographic medium. The essay defines what a holopoem is and explains the fundamental concepts of holopoetics. It proceeds to introduce theoretical principles that address the new readerly experience created by the holotext. A descriptive list of all holopoems created to date is provided, followed by an explanation of the author's writing processes and techniques. The essay concludes with observations concerning the future of holopoetry and other forms of innovative new media poetry.

# Holopoetry

Eduardo Kac

## Defining a holopoem

A holographic poem, or holopoem, is a poem conceived, made and displayed holographically. This means, first of all, that such a poem is organized non-linearly in an immaterial three-dimensional space and that even as the reader or viewer observes it, it changes and gives rise to new meanings. Thus as the viewer reads the poem in space — that is, moves relative to the hologram — he or she constantly modifies the text. A holopoem is a spatio-temporal event: it evokes thought processes and not their result.

A holopoem is not a poem composed in lines of verse and made into a hologram, nor is it a concrete or visual poem adapted to holography. The sequential structure of a line of verse corresponds to linear thinking, whereas the simultaneous structure of a concrete or visual poem corresponds to ideographic thinking. The poem written in lines, printed on paper, reinforces the linearity of poetic discourse, whereas the visual poem sets words free on the page. Like poetry in lines, visual poetry has a long ancestry, which runs from Simias of Rhodes, through the Baroque poets, to modernists such as Marinetti, Kamensky, Tzara, Cummings and Apollinaire, and most recently to the experimental poets of the 1960s and 1970s.

Following in this tradition, while at the same time opening up a new path, holopoetry began in 1983 by freeing words from the page. It was important back then, as it still is today, that the holopoem can be duplicated in large quantities and that it calls for silent reading. As distinguished from visual poetry, it seeks to express the discontinuity of thought; in other words, the

perception of a holopoem takes place neither linearly nor simultaneously, but rather through fragments seen by the observer according to decisions he or she makes, depending on the observer's position relative to the poem. Perception in space of colors, volumes, degrees of transparency, changes in form, relative positions of letters and words, and the appearance and disappearance of forms is inseparable from the syntactic and semantic perception of the text. The instability of color has poetic function and the visual mutability of letters extends them beyond the verbal domain.

If we compare the elements of language with the basic concepts of Euclidean geometry, as Bense has done in the analysis of visual texts,[1] we may think of letters as points, words and sentences as lines and visual texts as planes. Thus, letters would have dimension 0; sentences, dimension 1; and visual texts, dimension 2. By extension, one might conclude too quickly, holopoems, which free the text from the page and project it into space, would have dimension 3.

But holopoems are actually quadri-dimensional because they integrate dynamically the three dimensions of space with the added dimension of time. This is not the subjective time of the reader found in traditional texts, but a perceived time expressed in the holopoem itself. One does not need to look very far to realize that in fact any hologram (not only holopoems) can have dimensions other than three, for fractal geometry shows us that there are dimensions in between those numbered with whole numbers and we have software tools for creating images with fractional dimensions. Fractals teach us to accept the fraction, the passage from one dimension to the next, as a new value in its own right. In this context, Euclidean geometry becomes a part of fractal geometry, since dimension 2 is in between dimensions 1.9 and 2.1, for instance. Holofractals, therefore, can have dimensions other than three.

In mathematics, being a fractal means roughly being between a given dimension and the next higher or lower one. In art, being a fractal means, by analogy, being between the verbal and the visual dimension of the sign. Taking Bense's analogy further, we can conceive of a language — moving and changing in space-time — that moves this passage from the verbal

1 Bense, Max. 1975. "Textos Visuais." *Pequena Estética*. São Paulo: Perspectiva, 176-177.

code (the word) to the visual code (the image) and vice-versa. The poetic experience is enriched when the viewer or reader sees a work that continually oscillates between text and image.

It is very important to emphasize that not all texts recorded on holographic film are holopoems. It is technically possible, for example, to record a symbolist sonnet on a hologram. Such a sonnet does not become a holopoem simply because it is displayed on holographic film. What defines a holopoem is not the fact that a given text is recorded on holographic film. What matters is the creation of a new syntax, exploring mobility, non-linearity, interactivity, fluidity, discontinuity and dynamic behavior only possible in holographic space-time. It must be said that, in the future, even genuine holopoems might not be recorded on holographic film, since digital recording of holograms will become available. Holograms will also one day be scriptable. When that happens, new possibilities will emerge and holopoetry will lead to other, newer areas of poetic experimentation.

**Fundamentals of Holopoetics**

Poetry is an art that uses words as its raw material. Visual poetry enriched the word, giving it physicality on the surface of the paper and extended this physicality to other materials, as in the case of poems made with wood, plexiglas, glass and metal.

Holopoetry belongs to the tradition of experimental poetry, but it treats the word as an immaterial form, that is, as a sign that can change or dissolve into thin air, breaking its formal stiffness. Freed from the page and freed from other palpable materials, the word invades the reader's space and forces him or her to read it in a dynamic way; the reader must move around the text and find meanings and connections the words establish with each other in empty space. Thus, a holopoem must be read in a broken fashion, in an irregular and discontinuous movement, and it will change as it is viewed from different perspectives.

When one reads a conventional text or looks at the world around one, slightly different images are perceived by each eye. But in the reading of a book, newspaper or printed poem, this perceptual process is not evident, nor does it affect what is being read in any fundamental way: what the left eye sees is virtually the same as what the right eye sees. In the case of a holopoem, however, the reading is a synthesis of the two different inputs received by the eyes and is something more complex and intense. Here "binocular reading" comes in: we are constantly changing the way we mentally "edit" the text, based on the different inputs taken in during the fixations of each eye on the letters in space.

Because of the reader's perceptual activity, the holopoem's syntax is constantly changing. The holopoem's "perceptual syntax" is conceived so as to create a mobile signifying system and thus extend its expressive power to encompass time, since the words are not fixed upon a surface but rather float in space.

Holotexts can only signify upon the active perceptual and cognitive engagement on the part of the reader or viewer. This ultimately means that each reader "writes" his or her own texts as he or she looks at the piece. Holopoems don't rest quietly on the surface. When the viewer starts to look for words and their links, the texts will transform themselves, move in three-dimensional space, change in color and meaning, coalesce and disappear. This viewer-activated choreography is as much a part of the signifying process as the transforming verbal and visual elements themselves.

Language plays a fundamental role in the constitution of our experiential world. To question the structure of language is to investigate how realities are constructed. Holopoems define a linguistic experience that takes place outside ordinary syntax and conceptualizes instability as a key signifying agent. They blur the frontier between words and images and create an animated syntax that stretches words beyond their meaning in ordinary discourse. Holopoems undermine fixed states (i.e., words charged visually or images enriched verbally) and create a constant oscillation between them.

The temporal and rhythmic organization of holotexts play an important role in creating this tension between visual language and verbal images. Most of the holopoems I created between 1983 and 1993 deal with time as non-linear (i.e., discontinuous) and reversible (i.e., flowing in both directions), in such a way that the viewer/reader can move up or down, back and forth, from left to right, at any speed and still be able to establish associations between words present in the ephemeral perceptual field.

Holopoetry promotes new relationships between the appearance-disappearance of signifiers, which constitutes the experience of reading a holographic text, and our perception of

the organizing factors of the text. In this sense, visual perception of parametric behavior of the verbal elements heightens awareness of meanings. As readers move they continually shift the focus or center or organizing principle of their experience by looking through dispersed viewing zones. The text they experience stands against the fixity of print, and for the branching of holographic space.

Because of their irreducibility as holographic texts, holopoems resist vocalization and paper-print reproduction. Since the perception of the texts changes with viewpoint, they do not posses a single "structure" that can be transposed or transported to and from another medium. The combined use of computers and holography reflects my desire to create experimental texts that move language, and more specifically, written language, beyond the linearity and rigidity that characterize its printed form. I never adapt existing texts to holography. I create works that develop a genuine holographic syntax.

**Theoretical issues in holopoetry and the readerly experience**

Twentieth-century visual poetry evolved with the printed page as its basic structuring agent, as a support upon which ink is laid to form the verbal composition. As a physical surface where the poem is inscribed, the white on the page gained meaning and in most cases contrasted as silence with the verbal inscriptions

that often resonated as representations of sounds. Once printed, the verbal sign is fixed on the surface and its signification is bound by the rigidity of the page, very much like a line drawn on canvas. The comparison with painting is not accidental, because both modern poetry and modern art searched for the specificity of their materials simultaneously, leading to non-narrative poetry and non-figurative art. As modern painting moved away from representation becoming abstract, modern poetry moved away from the linear becoming fragmented. Some poets tried to give a new direction to the ancient "figurative poem" (i.e., a poem in the shape of an object), but this tendency is a minor part of modern and contemporary literary experiments. Even in Apollinaire's *oeuvre*, shaped words do not always signify straightforwardly the subjects of the shapes they were molded into, creating an ideogrammatic tension between the symbolic (verbal) and the iconic (visual).

Among the linguistic conventions of the West is the left-to-right orientation of the reading process, which is an arbitrary representation of the linear chain of spoken language. This is valid also for the two-dimensional page, which inherited the norm and is read from left to right and from top to bottom. In a sense, the reading from top to bottom follows an ordinary perception of reality, which is regulated by the action of gravity upon elements. A sequence of pages in a book is conventionally read from left to right as well, resembling the chain formed by sequences of words in a sentence. It is impossible not to take into account the limits imposed upon poetic creation by the physical properties of the visual space with which the poet works. The poet's challenge is exactly to disregard conventions and to create new codes, moving language beyond the redundant, the verbose and the ordinary. Modern visual poets distributed words freely on the page, or created self-referential structures, sometimes with permutational reading possibilities between the words in the fixed structure. They printed fragments of words enhancing their visual nature, or made the word an image in itself, always within the perimeter of the immutable page, or the tangible boundaries of firm and stable three-dimensional materials. The immutability and stability of two-dimensional and three-dimensional surfaces conditioned the signifying spectrum of visual poetry thus far.

In a reaction against fixed structures, holographic poetry creates a space where the linguistic ordering factor of surfaces is disregarded in favor of an irregular fluctuation of signs that can never be grasped at once by the reader. This turbulent space, with bifurcations which can take on an indefinite number of rhythms, allows for the creation of what I call textual instability. By textual instability I mean precisely the condition according to which a text does not preserve a single visual structure in time as it is read by the viewer, producing different and transitory verbal configurations in response to the beholder's perceptual exploration. The differences between the holopoem and other kinds of experimental poetry are marked by a set of characteristics that work together to destabilize the text, to plunge it into its specificity as written (text) as opposed to graphic representation (of speech), to create a syntax based on fleeting transformations and discrete leaps.

As Derrida has suggested,[2] no text can be fully controlled by its author, to whom its inherent contradictions and collateral meanings inevitably escape. The precise positioning of (apparently stable) words on the (inanimate) surface of the page gives author and reader the illusion of control, of mastery and command of the text (and often of the exterior reality it refers to). Holographic poetry tries to exhibit the impossibility of an absolute textual structure; it attempts to create verbal patterns with disturbances that magnify small changes in meaning according to the perceptual inquiry of the reader. For example: a syntactical system can be created in which one could see twenty or more words occupying the same space without overlapping; a word could also transform itself into another word/shape or vanish momentarily. Letters can collapse and reconstruct themselves or move to form other words in a time-reversal transition. These and all other latent expressive possibilities of holopoetry are unique to its grammar and they are only possible in part because its space, as I create it, is an oscillatory field of diffracting light as opposed to the tangible surfaces of pages and objects. The white page is removed and what remains is empty space, an absence of (printing) support which has no primary symbolic value. The vacuous gaps between words and letters do not represent positively the absence of sound, because the photonic inscriptions don't stand essentially for its presence. We are in the domain of spatio-temporal writing, four-

2 Derrida, Jacques. 1976. *Of Grammatology*. Baltimore, Maryland: The John Hopkins University Press, 58. Derrida states that the writer "writes in a language and in a logic whose proper system, laws and life his discourse by definition cannot dominate absolutely. He uses them only by letting himself, after a fashion and up to a point, be governed by the system. And the reading must always aim at a certain relationship, unperceived by the writer, between what he commands and what he does not command of the patterns of the language that he uses."

dimensional writing, where spatial gaps don't point to anything except to the potential presence of graphemes. The voids are not to be "seen," unlike the white on the page. They are, to take Derrida's words literally, an interplay of absence and presence.[3]

Needless to say, for the written word "airplane," for example, to refer to (to mean) the vehicle that transports people and objects by air, it must belong to the proper textual and cultural contexts and its letters must be perceived by our senses in the proper sequence. The word that results from the sequence of letters must remain visually constant. In visual poetry, the verbal sign has been subjected to a number of graphic treatments that contributed to extend the meaning of words beyond their conventional associations. But once a printed word is sliced, fragmented and/or incorporated into a collage, it cannot escape the immutability of the final composition.

The dissolution of the solidity of the poetic space, which makes the discontinuous syntax of holopoetry possible, also affects the signifying units of the poem, i.e., the word and the letter. One of the elements of holopoetry, which nevertheless does not necessarily appear in all holographic texts, is what I call fluid sign. It is essentially a verbal sign that changes its overall visual configuration in time, therefore escaping the constancy of meaning a printed sign would have as described above. Fluid signs are time-reversible, which means that the transformations can flow from pole to pole as the beholder wishes, and they can also become smaller compositional units in much larger texts, in which each fluid sign will be connected to other fluid signs through a discontinuous syntax.

Fluid signs create a new kind of verbal unit, in which a sign is not either one thing or another thing. A fluid sign is perceptually relative. For two or more viewers reading together from distinct perspectives it can be different things at one time; for a non-stationary reader it can reverse itself and change uninterruptedly between as many poles as featured in the text.

Fluid signs can also operate metamorphoses between a word and an abstract shape, or between a word and a scene or object. When this happens, both poles reciprocally alter each others' meanings. A transfiguration takes place and it produces inbetween meanings that are dynamic and as important in holopoetry as the meanings produced momentarily at the poles.

3 Derrida, Jacques. 1982. "Structure, Sign, and Play in the Discourse of the Human Sciences."In *The Structuralist Controversy;* The Languages of Criticism and The Sciences of Man, R. Macksey and E. Donato, editors. Baltimore, Maryland: The John Hopkins University Press, 64. Derrida: "Freeplay is always an interplay of absence and presence, but if it is to be radically conceived, freeplay must be conceived of before the alternative of presence or absence beginning with the possibility of freeplay and not the other way around."

The meanings of inbetween configurations can not be substituted by a verbal description, like the word "airplane" can be substituted in the proper context by its definition (i.e., "the vehicle that transports people and objects by air"). Neither can they be replaced by a synonym or a specific word, as gray suggests a specific intermediary position or meaning between black and white.

In holopoetry transient clusters of letters or ephemeral shapes that lay between a word and an image aim to dynamically stretch the poetic imagination and suggest meanings, ideas and feelings that are not possible to convey by traditional means. Holopoetry establishes a syntax of disruptive events; an animated language that evades and deflects interpretation.

Holopoetry is not possible without propagating light as the medium for interactive reading/writing. In holopoetry, texts are signifying networks animated by motion scripting and discontinuous word apparitions.

**Writing holopoems**

From 1983 to 1987 I pushed the limits of optical holography, writing poems that for the first time introduced, in the field of poetics, compositional elements such as pseudoscopy, discontinuity, luminous dissolution, three-dimensional juxtaposition, spatial compression, integral animation, color instability and digital synthesis of impossible spaces. The body of work I developed during this phase was shown in solo and group exhibitions. As a consequence of my search for a turbulent space that is prone to mutability, I began experimenting in 1987 with a new kind of text I call digital holopoetry. I write digital holopoems in a process of stereoscopic synthesis, as opposed to the method of optical recording I used for most of my other holopoems. This allows me to manipulate each element of the text with more precision.[4]

The writing techniques I have developed allow me to write texts in which the viewer, just by looking at words and letters, dislocates them from their position in a spacial zone. The unsettling choreography of my previous texts gained a new motion factor in addition to the "quantum leaps" and the

4 Whitman, IV. "Holopoetry: The New Frontier of Language — An Interview with Eduardo Kac." In Jeong, Tung H., editor. 1995. *Display Holography* (Fifth International Symposium), Proc. SPIE 2333, 138-145.

optical fusions that occur between two or more zones in space. I can now write pieces in which the reader perceives animated fragmentation and actual metamorphosis within a single zone, or I can incorporate these and other new possibilities into hybrid poems that integrate the optical and the digital. With digital holopoems I extend the solubility of the sign to the verbal particles of written language, the letters themselves, widening the gamut of rhythms and significations of the text.

My writing process can be outlined as follows: 1) generation and manipulation with digital tools of the elements of the text on the simulated space of the computer by means of raster or vector-based software (this step is the modeling stage); 2) study and previous decomposition of the multiple visual configurations the text will eventually have; 3) rendering of the letters and words, i.e., assignment of shades and textures to the surface of the models; 4) interpolation, i.e., creation of the animated sequences, which are now stored as a single file on the memory of the computer (this stage is a kind of motion scripting); 5) exportation of the file to an animation software and editing of the sequences, including post-manipulation of the elements of the text; 6) frame-accurate sequential recording on film of the individual scenes, which correspond to discrete moments of the text (this can also be done with an LCD screen); 7) sequential recording of the individual scenes on a laser hologram; and 8) final holographic synthesis achieved by transferring the information stored on the laser hologram to a second hologram, now visible in white light.

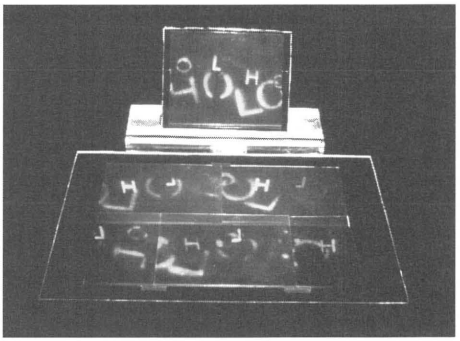
In this holographic process, film is used only as a temporary storage medium (due to its high resolution). When films are seen in theaters, all frames are projected in the same space, one at a time, in a rapid succession. The audience perceives exactly the same frame with both eyes. In three-dimensional film, two frames are projected in the same space at one time. Both frames correspond exactly to the same moment, but from discrete points of view. The audience perceives one frame with one eye, and the other frame with the other eye, thus forming a stereoscopic image. In holopoetry, all frames occupy the same space, all at the same time and are not projected but suspended in the same space. They are only

perceived if the viewer moves relative to the hologram. Frames can correspond to: 1) the same frozen moment or three-dimensional space as seen from different points of view; 2) different moments of an action; 3) completely different images corresponding to disparate spatio-temporal references. These possibilities create new reading and writing strategies.

The writer that works with holography must give up the idea of the reader as the ideal decoder of the text and must deal with a reader that makes very personal choices in terms of direction, speed, distance, order and angle he or she finds suitable to the readerly experience. The writer must create the text taking into account that these decisions, being personal, will generate multiple and differentiated experiences of the text and, most importantly, that all of these occurrences are equally valid textual encounters.

**Holopoems**

*Holo/Olho* (Holo/Eye), the first holopoem (1983), is a combination of anagrams in which the word "holo" mirrors "olho" and vice-versa. The mirroring effect, however, was conceived so that fragments of the poem would contain enough letters to form both holo and eye. The arrangement of letters in space was holographed five times; each hologram was fragmented and the five holograms were reassembled in a new visual unit. This holopoem recreated, in its own syntax, a system that corresponds to the holographic model, according to which the information of the whole is contained in the part and vice-versa.



*Holo/Olho* (holo/eye)
Eduardo Kac
(with Fernando Catta-Preta)
10 x 12 in.
Reflection holograms mounted on wood and glass. 1983
Collection of the artist

Then came *Abracadabra*, a holopoem created between 1984 and 1985. This work illustrates well the concept of discontinuous space, because precise control enabled me to predetermine the region in space where each letter was to be placed, as well as the specific angles at which they would become perceptible. Thus at no time can the reader simultaneously perceive the complete set of letters that make up the word: one is forced to read discontinuously, in broken fashion. In this holopoem, the letter "A," which symmetrically structures the word AbrAcAdAbrA, was image-planed (with part of the image in front of and part behind the plate) in the center of the visual field, while the consonants were placed around it (b and c as real images; d and r as virtual images) as if the vowel were an atomic nucleus and the consonants were the particles orbiting around it.

I created the holopoems *Oco* and *Zyx* in 1985. *Oco* employs two holograms, one with the letter "l" and the other with the word "oco." The first is displayed in front of the second, multiplying reading possibilities. In *Zyx,* I used the three letters that name the axes of three-dimensional space to form new, nonexistent, bizarre-sounding words. The actual work is a set of fragments against a reflecting background that duplicates the reader's face inside the hologram and presents the letters "x, y" and "z" in discontinuous fashion. In this holopoem, the volume of each letter dissolves into colors.[5]

In 1986 I made three new pieces. In the holopoem *Chaos* the letters "C, h" and "a" are distributed in pseudoscopic space (space where the image is inverted, inside out — the opposite of orthoscopic space), so that they move in space in a direction opposite to that of the reader's movement. This work opens the possibility of a letter changing into an abstract color image and vice-versa, for pseudoscopic space does not respect optical conventions regarding the proportion and conservation of forms. The letters "s" and "o" complete the reading in absentia, eliciting "sos" from the word "chaos." Other intertextual possibilities may emerge, such as the words "só" and "ossos" ("alone" and "bones" in Portuguese, respectively).

Also in 1986, I made the holopoems *Wordsl No. 1* and *Wordsl No. 2*. The first is an experiment in optical anamorphosis: the letters of the words "world" and "words" were holographically combined into a new word, "wordsl," and placed in a 180° arc around my head. This information

5 My first four holopoems were made with Fernando Catta-Preta.

was transferred to a 90° hologram, through a process of contraction in virtual space (space within the hologram) that changed the forms of the letters; some of the letters, however, seem to go around and behind the hologram, reappearing in their proper proportions in real space (space in front of the hologram).[6] The curvature itself of the integral hologram (so called because it integrates motion pictures and holography and because it recreates the integral movement of a scene) is the cause of this phenomenon. This relates to the topic of visual deformation in variously curved spaces, which was investigated by Georg Riemann in 1854 in his non-Euclidean geometry and which greatly interested avant-garde artists early in this century.[7]

*Wordsl Nº 2* displays the same verbal material, only this time in a space that is both real and pseudoscopic. This piece proposes a reading in a succession of vertically oriented strips (from the bottom up and vice-versa), a sort of scanning instead of a global sighting of the scene or object.

In 1987, I created the holopoem *Quando?* (When?), in which a monolithic abstract shape rotates around its own axis, alternately disclosing and concealing the words of the text as it spins.[8]

I created a 360° hologram, but not a 360° image that is seen as one sees a sculpture or an ordinary object. The monolithic fractal object rotates to accomplish almost two full turns inside the hologram. It thus widens the 360° space to nearly 720°. This gives rise to a perceptual paradox only made possible by holography: although one sees a 360° plexiglas cylinder inside which there is a 360° holographic film, the fractal turns and multiplies the holographic space.

The text was conceived so that it could be read at any angle, but there is a basic structure that allows it to be read either clockwise or counterclockwise. Counterclockwise the viewer reads A LUZ / ILUDE / A LENTE / LENTA / MENTE (the light/ deceives/the lens/slow/ly); clockwise the text is A LENTE / ILUDE / A LUZ / MENTE / LENTA (the lens/deceives/ the light/ slow/mind). Other readings, just as valid as these, may arise, for instance, A LUZ/ MENTE / LENTA / A LENTE / ILUDE (the light/lies [i.e., tells lies]/slow/the lens/deceives).

6 Jason Sapan shot 16mm film for this piece and Larry Lieberman made the transfer to holographic film. Jason Sapan also shot a documentary video of the making of *Wordsl*.

7 Henderson, Linda. 1983. *The Fourth Dimension and Non-Euclidean Geometry in Modern Art*. Princeton, New Jersey: Princeton University Press.

8 This piece was created with Ormeo Botelho. The film footage was transferred by Larry Lieberman.

In Portuguese, the adverb lentamente (slowly) is made up of the adjective lenta (slow) and the adverbial suffix -mente (-ly), which as an autonomous word may mean either "mind" (noun) or "lies" ("tells lies").

These words never appear all at the same time; they become visible as the fractal turns inside the hologram and restructures its space. The words float before the fractal, and every time it turns, a new one appears. It is the fractal that causes the passage from one word to the next. As the fractal turns and passes from one word to the next, the words, which are legible when viewed frontally, are seen sideways, thus becoming illegible. They are seen as abstract forms. In this case, the text loses its verbal meanings and the entire set changes into a nonverbal form; thus the revolving fractal makes the viewer see a text in a reversible process. As the fractal turns, the boundary between word and image is assigned to time. For instance, the viewer will read, depending on his or her momentary perspective, the adverb lentamente (slowly) or see it change into the noun mente (mind) and the adjective lenta (slow). From another view, one can read mente as a verb preceded by a luz: a luz mente ("light lies," as in "tells lies").

While still living in Rio de Janeiro, Brazil, I produced seven holographic poems, from *Holo/Olho* (1983) to *Quando?*(1987/88). These early pieces were made either in Brazil or in the United States. In 1989 I moved to Chicago, where I was able to work and experiment on an ongoing basis. Below I describe briefly the poems I made in Chicago.[9]

My first piece in Chicago was *Phoenix* (1989), a poem composed of only one letter that draws attention to its visual properties instead of representing a particular sound. Designed with ambiguity, the letter "w" might be perceived as a stylized bird with open wings. It floats in front of the holographic film plane and is transfixed by a vertical open flame that can be read as the letter "i" and which moves randomly according to air currents. The laser transmission letter-image produces a curious harmony with the actual flame, suggesting that we are as fascinated by laser images today as the primeval man was by fire. Where the laser red meets the blue flame, a hybrid magenta is perceived.

9 Kac, Eduardo. 1989. "Holopoetry and Fractal Holopoetry: Digital Holography as an Art Medium." *Leonardo*, 22:3/4, 397-402. "Recent Experiments in Holopoetry and Computer Holopoetry." *Proceedings of the International Symposium on Display Holography*. SPIE 1600, 229-236; and "Holopoetry, Hypertext, Hyperpoetry." *Holographic Imaging and Materials*, Proc. SPIE 2043, 72-81.

Conceived in collaboration with Richard Kostelanetz, the holopoem *Lilith* (1987/89) employs words in French and English to comment upon the legend that gives it its title.[10] In popular Jewish etymology, Lilith means "devil of the night." Its understanding as the "female devil" has Babylonic roots, but Lilith also stands for any myth of "female devils." In Jewish mystic literature, she is the Queen of the Demons. According to another legend, still, she was the first wife of Adam. As opposed to Eve, Lilith was not created from Adam's body and therefore was totally independent of him. According to this legend, it was only after Lilith left Adam that Eve was created. In traditional cabalistic literature — until recently a male-dominated field — she is the symbol of sensuality and sexual temptation. The transformations that take place in the poem between the words HE, EL (short for "Elohim," or "God"), ELLE ("she" in French and mirror image of EL) and HELL are meant to unveil and criticize the bias that surrounds the myth of Lilith, product of a male-dominated culture creating God in its own (male) image.

Three pieces that followed, *Albeit* (1989), *Shema* (1989) and *Eccentric* (1990), approach the issue of structuring a text in discontinuous space in three different ways. *Albeit* is composed of five words that are duplicated and fragmented in space by means of fourteen masters (the counterpart of "negatives," in photography), to produce a dense configuration built upon layers of small color fields and the empty spaces between them. The words are read almost in stroboscopic manner from different viewpoints, multiplying meanings and paralleling, in the process of fragmentation, the contradictory reference to time that the text signifies. The word "take," for example, can be perceived as a verb ("take your time") or as a noun ("your take is over") — a syntactical fluctuation that is instrumental in the textual instability of holopoetry. The word "time," in another instance, can be a subject, as in "time take(s) over," when the letter "s" is read in absentia. But it also can be a direct object, as in "take your time."

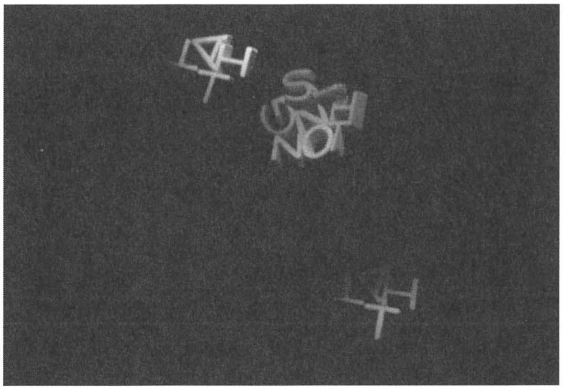
*Shema* is structured with verbal signifiers floating in three expanded color fields that interpenetrate each other, creating a transitional discontinuity between them. The text is in Hebrew and is composed basically of four words and one big letter. The

10 This piece was created when Richard Kostelanetz and I met again in Rio de Janeiro in 1987. The pulsed master hologram was shot by Fred Unterseher in Germany, when Kostelanetz and Unterseher met there in 1988. The piece was finally made into a white-light hologram by myself in Chicago in 1989.

letter modifies the four words to suggest four new words — depending on the viewer's decisions as s/he moves in front of the piece. In this sense, the word "maim" (water) may be modified by the letter "shien" (s), to produce "shamaim" (sky, heaven). The word "mavet" (death) may be modified by "shien" to suggest "Shmvot" (Exodus). The word "mah" (why?, what?), may be modified to form "shamah" (desolation, destruction). At last, the word "mash" (to remove) may become "shemesh" (sun). The possible eight words produce an atmosphere of associations, suggesting feelings about death and emotional loss. The piece is dedicated to Perla Przytyk, in memoriam.

As with the words in the two previous texts, the basic nine words in *Eccentric* ("shadows, sounds, smells, nos, nevers, nothings, that, memories, erase") can never be seen simultaneously in space. But this time, the viewer can not even perceive the words when he or she looks at the piece from a central position. In order to perceive each word, the reader must invent his or her own topological code. One must look for the words diagonally and decide if he or she will read looking up or to the left alternately or successively, or down and to the right concurrently. The crisscrossing invisible narrow viewing zones that form the poem allow for a highly turbulent syntax. Adverbs ("nevers, nos") are found in unusual plural form to stretch their meanings and nouns in the plural ("sounds, smells, shadows") can be read as verbs in the present tense of the third person singular. The very configuration of the letters within each word suggests different interpretations, like the noun "nothings" implying the phrase "not this sign." In parallel configurations, the pronoun "that," for example, can become a conjunction ("nos that shadows erase"), a deitic pronoun and/or a conjunction ("smell that nevers"), an adjective ("that shadow(s) that nothings erase") or a subject ("that sounds memories").

*Amalgam* (1990) is composed of two sets of two words each ("flower-void" and "vortex-flow"), and each set blends into the other as the viewer tries to read the text. The reader sees the visual transition between the sets as an attempt to produce a semantic transition as well, so that the inbetween shapes indicate inbetween meanings. In other words, when the left eye sees one set and the right eye sees the other set simultaneously (as opposed to both eyes perceiving slightly



*Eccentric*
Eduardo Kac
16 x 20 in.
Multicolor white light transmission hologram
1990, Collection Dean Randazzo, Saint-Clair Shores, Michigan

different viewpoints of the same set), the viewer is actually seeing a transitional verbal sign that possesses transitional meanings. This is what I call binocular reading. Normally, left and right eyes see, say, the letter "a," from their respective viewpoints. Here, for example, the left eye could see the letter "a," but the right eye sees at the same time the letter "b" instead. Both eyes try to force a synthesis that is deterred by the retinal rivalry.[11] Within this process, a complementary reading strategy can be implemented: nouns can be interpreted as verbs as in "flow (and) vortex flower," or "flower (,) void (and) vortex flow."

The first digital holopoem I created in Chicago was *Multiple* (1989), in which the sequence of numbers 3309 is seen floating in space. As the viewer moves past the numbers, they rotate around a pivot point, changing to an abstract pattern and then to the word "poem" (and vice-versa); at first the three-dimensional form remains the same as it would if it were a regular object — but then it changes. Parallax is responsible for the production of meaning, which is based on the triple function of the sign (word-image-number). This piece translates a characteristic of the Hebrew alphabet (in which letters also stand for numbers) into the Latin one.

*Souvenir D'Andromeda* (1990) is composed of a single word, which is also perceived as a set of abstract shapes depending on the beholder's viewpoint. If the viewer reads the word "limbo" at first, as he or she moves, the word rotates (crossing from virtual space to real space and vice-versa) and comes apart (as if exploding). As this happens, the word fragments, which are not legible anymore, are perceived as pure visual forms. This process reverses in space and time.

11 For a discussion of retinal rivalry and other aesthetic elements unique to holography, see: Kac, Eduardo. "On Holography." *New Media Technologies*, Ross Harley, editor, AFTRS, New South Wales, Australia, 1993, 123-139. "The Aesthetics of Holography." *Display Holography* (Fifth International Symposium), Proceedings, SPIE 2333, 123-137.

If the fragmentation of a sound still produces phonetic resonances, the fragmentation of a letter produces visual shapes — a process that exhibits the graphic nature of written language as opposed to the phonetic nature of spoken language. The word "limbo" connotes "oblivion, suspension" and "nothingness" in several languages meanings which are enhanced by the visual process of fragmentation.[12]

In *Omen* (1990) the word "eyes" floats and spins, emerging and dissolving in a space defined by luminous smoke. This spinning of the word happens so as to make the letter "e," as seen from a specific viewpoint, vanish into the smoke before the whole word does, making the reader perceive the word "yes" at the edge of legibility, suggesting the word "see." The smoke is charged with ambiguity, because it is perceived both as an element that blocks vision and as a transparent medium. Through this orchestrated motion, it is my intention to create a metaphor that expresses the hazy vision of a future occurrence.[13]

In the three pieces mentioned above I explored movement, but did not work with syntactical discontinuity as I have done in other texts, such as *Abracadabra, Albeit* and *Eccentric*. My interest in writing motion texts with irregular syntactical links in a heterogeneous perceptual field lead to three new pieces produced in 1991.

*Adrift* is composed of seven words that dissolve in space and into each other as the viewer reads them. In one case, the reader may be invited to start reading from the letter which is further away

12 Marla Schweppe produced the digital files for *Multiple* and *Souvenir D'Andromeda*.

13 For a more detailed description of "Omen," see E. Kac, Eduardo and H. Bjelkhagen, "Holopoem blends pulsed and computer holography," *Laser News*, XI:1, 3. Bains, Sunny. " Smoke gets in your eyes." *Holographics International*, 8, 14.

from him or her. In another case, the letter closer to the reader could be the starting point. The reading process occurs back and forth along the z axis. This piece is also an attempt to work both with the optical and digital, trying to make one lend its properties to the other. The letters that make the words are floating irregularly along several z axes, except for the word "breathe," which is integrated into the overall light field. This word is blown by an imaginary wind as its letters actually move away from their original position to dissolve again in the light field. The movement of the letters in this word disrupts the apparent stability of the other words.[14]

The next holopoem I made in this new series was *Zero*, in which words grew or shrank, or turned and broke, to express the drama of an identity crisis in a future world. Rotations, fusions and other actions made the words emphasize their relations and meanings in space. The multiplicity of "selfs" that would be inexorable with the proliferation of cloning is the ultimate theme of the poem, but for a more attentive reader the answer to the enigma could be found in words residing in other words.

In *Adhuc*, the third in the series, as the viewer moves relative to the poem trying to read it, he or she perceives the manifold choreography of the basic words of the piece ("whenever, four years, or never, far eve, forever, evening"). All the words refer to time in varying ways, contributing to an overall vagueness that could resist assessment at first sight. 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.

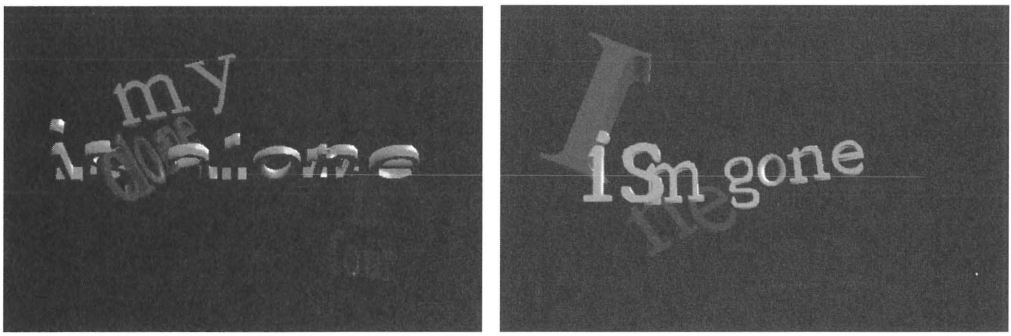
*Astray in Deimos* (1992) explores metamorphosis as its main syntactical agent. Deimos ("terror") is the outer, smaller satellite of Mars. The piece is comprised of two words rendered in wireframe (eerie and mist), which are seen through a circle of predominantly yellow light. Surrounding this scene is a web-like landscape made of shattered glass, which partially invades the yellow light circle. The circle may represent Deimos as seen on the sky from the ground, or a crater on the surface or even a spacecraft window through which one may look down at the spacescape.

14 This piece was commissioned by Ruth and Marvin Sackner.

As the viewer moves relative to the piece, he or she perceives that each line that renders the graphic configuration of each letter starts to actually move in three-dimensional space. The viewer then perceives that as the lines and points go under an actual topological transformation, they slowly start to reconfigure a different wireframe letter. What was read as an adjective is becoming a noun. I referred to this as semantic interpolation. If the viewer happens to move in the opposite direction, the noun is transformed into the adjective. The shifting of grammatical forms occurs not through syntactical dislocations in a stanza, but through a typographic metamorphosis that takes place outside syntax.

In the process of transformation the intermediary configurations of the letters, which do not form any known words, evoke in nonsemantic fashion meanings that are conceivably intermediary between the two words (eerie and mist). The point here is that this metamorphosis allows the text to suggest other meanings beyond the two words located at the extreme poles of the process. The viewer has to read the transformations without trying to extract semantic meaning from the nonsemantic forms. These inbetween verbal signs attempt to communicate at the level of abstract visual signs which have no extra-pictorial reality, at the same time that they operate under a specific framework provided by the words at the poles. This can be very difficult at first because it escapes our common expectations about how language operates. For example: if I refer to the colors "black" and "white," I can think of a third term that will clearly define an intermediary color, "gray." This precision becomes impossible, for example, if I refer to the words "knife" and "light." There is no common word that can define an intermediary state or concept between

*Zero*
Eduardo Kac
12 x 16 In.
Multicolor white light transmission digital holographic stereogram
1991, Collection Museum of Holography, Chicago, Illinois



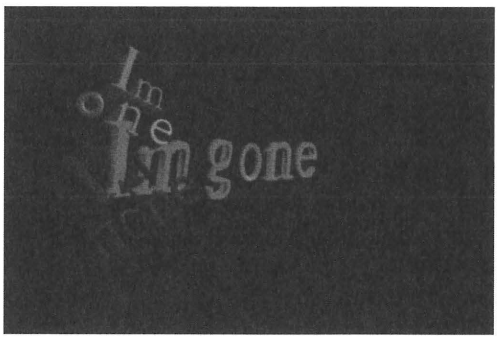
the two nouns. Only in poetry this is conceivable. In *Astray in Deimos* the metamorphosis between eerie and mist has the same emphasis that the two individual words have, without forcing the intermediary shapes to refer to extra-linguistic qualities or things in the way the two words do.

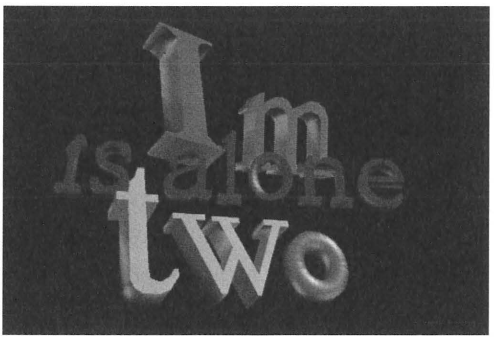
*Astray in Deimos* may be interpreted as a spatial haiku of sorts. Its natural subject is the landscape of Deimos, one of the two moons of the red planet. This holopoem is imaginarily written by someone who has visited Deimos, which so far is only known to us through photographs taken by the Mariner and Viking probes. The attentive reader will notice that if the word mist is perceived first, followed by eerie, a phonetic link between the two words suggests a third one: mystery.

*Havoc* (1992)[15] is composed of thirty-nine words distributed in three panels. The viewer can start reading from left to right or vice-versa, or even start in the center and move in the desired direction. The left panel has fourteen words ("now, is, ifs, and, airs, are, mist, but, pens, are, thoughts, if, jazz, is, touch, so, splash, jumps, dry"), the center panel has one word ("when"), and the right panel has fourteen more words ("she, is, he, if, faces, erase, smiles, but, thens, say, are, memories, airports, like, drops, under, moons, of, maze").

The verbal material in the left and right panels is organized vertically in three-dimensional space. I used two different type faces in this piece. When a row has two words, one word is written with serif type and the other with a sans serif type, creating an alternating visual rhythm. The color of the word(s) in one row is different from the color of the word(s)

15 The holopoem *Havoc* was supported in part by a New Forms Regional Grant, a program administered by Randolph Street Gallery and the National Afro-American Museum and Cultural Center, and funded by the Inter-Arts Program of the National Endowment for the Arts and The Rockfeller Foundation, with additional support from the Illinois Arts Council and Randolph Street Gallery.



in the other row, but identical to the color of the following row, and so on. As in most white-light transmission holograms these colors are never stationary, but the relative chromaticity is preserved regardless of the viewpoint of the observer. This color modulation extends the rhythm created by the font selection and helps interweave the words visually.

As the viewer moves relative to these two panels, which are usually seen one at a time, all the words in them twirl simultaneously, as if drowned by a violent vortex. The words lose their graphic stiffness. They stretch, deform and contort themselves. As the words collapse they blend into one another becoming absolutely illegible. They form swirling patterns at the edge of the viewing zone and, if the viewer moves in the opposite direction, they return to their temporary state of rest. The opposite rotation of the words in these panels resembles the equally opposite water vortices seen at the northern and southern hemispheres. This fluid visual metaphor is an important element of the piece.

The center panel has a different behavior. An abstract shape morphs into the word "when" which morphs again into an abstract shape, placing the word at the transitory position preserved in other pieces for the nonsemantic inbetween shapes. But instead of the smooth metamorphic transition created in *Astray in Deimos*, for example, the word "when" goes through a compressed and violent process that generates time-smear. Time-smear occurs when the viewer perceives simultaneously two discrete points in the trajectory of a letter or word separated in time. One point can be the present or the future in relation to the other and the converse, which is to say that both are suspended in time non-sequentially. This unconventional concept translates itself visually into ever unfolding amalgams of images which are perceived as oscillations by a non-stationary viewer. The abstract shapes and the word are decomposed at the boundary of legibility. Surrounding this shifting scene are semi-curved light forms that change and fluctuate. The convex sides of these wave-like diffused semi-circles face outwards, as if placing now and then the word "when" in a perpetually moving fluid parenthesis.

The title of my next holopoem is *Zephyr* (1993),[16] which means "a gentle breeze." In this piece a relationship of semantic equivalence is created between word fragments and images seen in transition. It employs particle animation[17] and synthetic water ripples. Particles and ripples are disturbed by an invisible air flow which is imaginarily caused by the reader as he or she moves in front of the piece. As the reader explores the work, verbal and visual elements move and change, making a statement about the fragility of the human condition. The letters in this piece form a word inside another word, one being affirmative (life) and the other seeming to question its assertive character from within (if). As the viewer moves relative to the piece, it oscillates between preserving these oppositions and solving them by blending the opposite terms. Due to the mutability of forms and the unstable behavior of words in space, viewers have read other words (lone, love) in this piece also.

As the viewer moves relative to the piece, he or she perceives that the letters are made of minute particles, and that these particles fly towards the viewer – as if they had been blown in the air. A three-dimensional cloud of particles is formed in space. If the viewer moves in the opposite direction, this cloud flies away from the viewer and reconstructs the letters, as if the viewer had blown them away from him or her with his or her own gaze.

The word "if" is projected on synthetic water. I disturbed the synthetic liquid surface where the word is projected in order to record visual oscillations of the word. The meaning of doubt raised by this word is reinforced by its wavy motion, since the word is perceived as word or abstract pattern depending on the momentary position of the viewer in relation to the holopoem.

All letters are integrated into one entity, but they also dissolve into one another. Looking at *Zephyr*, the reader finds buoyant words, as if particles and ripples were relying for their movement on the vagaries of air currents and the displacement of small air masses caused by the movement of the viewer.

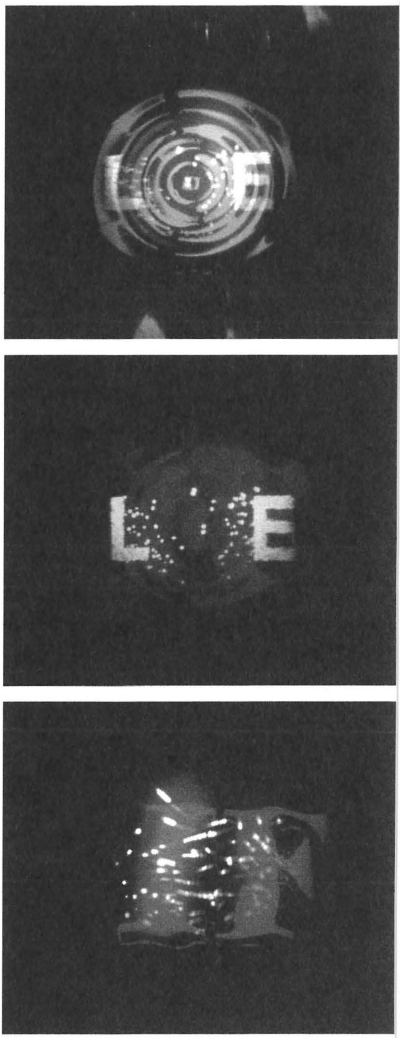
16 The holopoem *Zephyr* was partially supported by a grant from the City of Chicago Department of Cultural Affairs, and the Illinois Arts Council Access Program.

17 Particle systems can be described as an animation technique in which large amounts of very small three-dimensional objects (computer-generated particles) are set to motion simultaneously under a combination of random factors and algorithmic control. Parameters used to animate particles include life span (i.e., for how long they move), speed, quantity, size, color, starting and ending point, and direction of travel. Once the animation starts, hundreds or thousands of particles move by themselves under constraints set by the artist. There is no need to create key frames or to set motion paths for individual particles.

My most recent piece, *Maybe Then, If Only As* (1993), is a subjective statement about what I see as the relationship between the elusiveness of language and the unpredictable and turbulent behavior of nature. The piece involved the recording of three separate space-time layers of information.

The first contained three words: "where, are, we?" The letters in the word "where" spin and visually dissolve into falling snow flakes. The words "are" and "we?" are underneath "where" and are skewed as the process described above takes place. These two words are partially covered by the snow flakes of "where."

The second layer contains the following words: "here, we, are, there, ink, instants and why?". These words can only be seen from discrete points of view and were subjected to other animated processes. The "a" in "are" spins away from the viewer into holographic space and the other letters move up to suggest "were." The first four letters in the word "instants" slowly disappear leaving "ants" to be perceived at the edge of legibility. The word "why?" is seen flashing at different moments, in different positions, across the space in a



*Zephyr*
Eduardo Kac
White light transmission digital holographic stereogram
1993, Collection Karas Studios, Madrid, Spain

jerky fashion as a graphic echo. These relationships are suggested when the viewer perceives the words breaking down and reconstructing other words in the immaterial holographic space. The words are perceived only for a brief moment and are interrupted by the presence of other animated words.

The third layer was used to record dry branches coming out of the film plane and reaching out to the viewer. The branches were recorded against a background of light-generated patterns that subtly evoke cloud-like forms.

**Holopoetry and the future of experimental poetics**

Holopoetry defines a new domain of poetic exploration where the text is written with the malleable medium of light, where the word is free from surface constraints, where textuality is signifiers in motion. In a holopoem, the verbal phenomenon cannot be dissociated from the spatio-temporal environment of the optical and synthetic hologram.

If one is concerned with the development of a new poetry for the digital age, it is important to write visual poetry in a medium different than print, a medium that is fresh and the conventions of which are yet to be invented. To me, holography is such a medium, but I must point out that the use of new media does not constitute, by itself, a standard of quality or of authentic contribution to the repertoire of experimental writing. For example, if someone uses holography simply to reproduce a poem that was fully realized in another form (verse, graphic, etc.), he or she is not creating what I call a holopoem.

*Maybe Then, If Only As*
Eduardo Kac
Muticolor white light
transmission digital holographic
stereogram
1993, Collection of the artist

In Western societies we are all used to electronic texts on television performing the most elaborate pirouettes on the screen. A golfer hits a ball and letters announcing a tournament are scattered on the screen. An electric shaver follows a path made of text about the product, "shaving" the text in the process. Logos fly onscreen to sell the visual identity of large corporations, and so on. The dynamic use of language that we are used to on television promotes most often redundancy, commodification and banalization.

The new generation of poets belong to the media culture. They breathe television, video, videophones, computers, virtual reality, CDs, CD-ROMs, telepresence, holography and the Internet. In a literary culture still dominated by print, the author of experimental poetry that can only be read in electronic or photonic media will encounter many problems in trying to reach the audience (however small this audience might be). Regardless of these problems, or perhaps because of them, it is this generation's challenge to create dynamic electronic and photonic texts that recover the conceptual power and the mysterious beauty of language.

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Acknowledgement
The following reflections on new media poetry were partly developed in collaboration with Arie Altena, formerly research assistant at the Department of General Literary Studies, University of Amsterdam (and editor of *Mediamatic*, an international magazine on media theory and media art). The course on interactive literature that he and I taught during the Fall trimester of 1995 presented many of the thoughts inspired here. I also gratefully acknowledge his valuable comments on earlier versions of this essay.

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# New Media Poetry — Theory and Strategies

Eric Vos

Going beyond the mere employment of new communication technologies in the production of poetic texts, new media poetry integrates characteristics of the new media in the theoretical basis of its poetics. This paper outlines this basis and shows how it affects poetic and verbal conventions, particularly with respect to the constitution of texts and the roles of author and reader, and with regard to its implications for our views on language. The author thus contends that 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. This view is further developed through a discussion of some writing strategies of new media poetry.

## New Media Poetry
## - Theory and Strategies

New media poetry is innovative poetry created within the environment of new communication and information technologies. This observation is, of course, all right and all wrong. It is all right in describing the new media as environments for the creation of poetry, as offering technological possibilities for experiments in writing poetic texts. That is what is documented, for the first time, in this anthology. But it is all wrong in suggesting that the basis for new media poetry is merely to adopt these technologies as writing, publishing and reading tools. Computers, word processors, modems, communication software and the Internet all take part in the writing and reading of poems published in online literary periodicals such as *RIF/T* — but they do not necessarily partake in their poetics. Many poems scattered over the Internet appear to ignore their electronic environment as much as they possibly can, aspiring to the conditions of print poetry. And that is evidently not what new media poetry seeks to achieve.

So we must expand our definition. New media poetry is innovative poetry created and experienced within the environment of new communication and information technologies — and it could not have been created and cannot be experienced in other environments. It is a poetry based on the integration of characteristic features of these technologies in the strategies that underlie the writing and reading of poetic texts. In terms of the labels often attached to new media, we are dealing with a virtual, dynamic, interactive, immaterial poetry. This appears to be a much more valid description of new media poetry — but what does it mean?

Well, one answer could be: That is precisely what the various poets represented in this anthology attempt to find out in and through their explorations of the poetic domains offered by the new media. But we will attempt to go a little further than begging the question in this way. We shall try to develop an account of the basis of new media poetry, or at least to sketch the contours thereof. We call this basis theoretical rather than poetical because it expands the habitual domain of poetics to include considerations on communication and information theory, semiotics and interart relationships. Also, we will discuss some characteristic writing strategies of new media poetry. But in all this, we are well aware that we must leave many important questions unanswered.

We shall focus on what is new in new media poetry — but what about the links with the tradition of (experimental) poetry? Surely new media poetry did not come to us unprecedented. What has given rise to its present development? What is the reason that in our time many poets from completely different backgrounds, often — at least initially — unaware of each others existence and works, in such remote parts of the world as Brazil, France, Argentina, the United Kingdom, Germany the United States, Portugal, the Netherlands (the list could of course be expanded), envisaged a future for poetry in the context of the new media? What is the relationship between their poetic work and their literary, socio-cultural, ideological and historical environments? We shall focus on the common traits of their poetry — but what about the differences between their poetr*ies*; what about the variety of forms to which new media poetry has already given rise and which will surely increase in the years to come? We can only hope that such questions will be taken up soon and that our thoughts may be of some use in answering them.

In what follows, we shall often use the term "communication." We believe that communication is the focal point of both the new media and the new poetry that make up new media poetry. Since we do not advocate a particular model of communication, the reader is free to supplement our views with his/her opinions on the structure of the communication process. But there is one proviso: "Communication" must *not* be read as denoting a process the success or failure of which depends on whether or not the intentional objectives of a "sender" are "understood" by a "receiver." It should *not* be envisaged as a unilateral relationship, in which the "sender" bears sole responsibility for his "message" — or claims full control over it — and the "receiver" is nothing but a decoding agent. As we will make clear, such a view would contradict the very basis of new media poetry. Or, reversely, the innovative explorations undertaken in this poetry are invariably aimed at generating a different communicative space.

## New media, new poetry - the theoretical basis

We may take that notion of "space" quite literally. Writing, J. David Bolter reminds us,[1] always is and always has been a topical affair — i.e., an affair determined by the space of writing. Writing on paper pages, codex format or writing with a printed book in mind differs from writing on clay tablets or papyrus scrolls not just in employing other tools. It means that the writer is engaged in an activity that takes place in a different environment, organized by a different set of rules and conventions. These environments are crucially important: status, nature, structure and use of the written work are determined by them.

In the process of being established as such a "writing space" a new medium like hypertext affects all these "concerns," to use William Dickey's term,[2] which, as he sums up,

> include 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.

In their concern with the interplay between text and space, hypertexts are therefore "tentative, fluid, changeable."[3]

Dickey's triad may serve to mark the generically important distinction between poetry that merely addresses and poetry that genuinely adopts the new media as a writing space. This distinction becomes obvious when we very briefly compare the kind of poetry represented in this anthology with the kind of poetry discussed, for instance, by Marjorie Perloff in her *Radical Artifice. Writing Poetry in the Age of Media.*[4] Perloff's is an eminent analysis of the ways in which contemporary experimental poetry addresses new media and communication technology and confronts itself with the semiotics of (electronic) mass media. But the poetry discussed is invariably print poetry. The writing is done on the page. Concepts like tentativeness, fluidity and change may very well become relevant for both the reading processes and the reconsiderations of habitual thoughts on language, poetry and verbal communication to which this writing gives rise — but the written poetic text itself is given, static and fixed. That is what print tends to do to writing.

Surely, the L=A=N=G=U=A=G=E poetry, John Cage's mesostic writings, Steve McCaffery's typewriter experiments, Oulipian devices and other works presented by Perloff all question the concept of the poetic text as a conduit, aesthetically valuable because of its construction, through which some pre-encoded message is transmitted from author to reader. And surely that view on poetry as an aesthetic process of encrypting and decoding messages had already been challenged by experimental poets of the past. In this respect, such poetic works share an interest with new media poetry. But in all these former instances — from the dada sound poem and the futurist *parole in libertà* to the hybrid works of visual poetry, even to the texts produced by the programs of the first computer poets — the poetic text itself is already there; it is presented to the reader in a fixed, final format. New media poetry offers the reader the opportunity, the means and the information (e.g., digital data) to bring a text into virtual existence. In new media poetry, the poetic text is not already there; it is not a package for but a parameter of the poetic communication process.

This, of course, is not to say that there are no messages, no meanings, no aesthetic values in new media poetry at all. The point is that they cannot be thought of as being contained in the text and being delivered to the reader through this text, for there

1 Bolter, J. David. 1991. "Typographic Writing: Hypertext and the Electronic Writing Space." In Delany, Paul and George P. Landow, editors. 1991. *Hypermedia and Literary Studies.* Cambridge, Massachusetts: MIT Press, 106. See also Bolter, J. David. 1991. *Writing Space: The Computer, Hypertext & the History of Writing.* Hillsdale, New Jersey: Lawrence Erlbaum and Associates, passim.

2 Dickey, William. 1991. "Poem Descending a Staircase: Hypertext and the Simultaneity of Experience." Delany and Landow, editors. *Hypermedia and Literary Studies*, 144.

3 Dickey, "Poem Descending a Staircase," 145.

4 Perloff, Marjorie. 1991. *Radical Artifice: Writing Poetry in the Age of Media.* Chicago: University of Chicago Press.

is no text independent of the reader's search for it.[5] Messages, meanings and values are created alongside and with the text.

Nor is this to say that bringing a text into being is the only objective of new media poetry. It is, rather, a point of convergence between the various activities of poet and reader that, in their mutual dependence, constitute the poetic communication space. What really counts in new media poetry is the way in which the ramifications of these activities transform the entire field of poetic communication. In the remainder of this section, we shall discuss four aspects that we consider particularly important: first, the exploration of *interrelationships between* constitutive factors of that field; second, the role of *unique features* of the new media in this respect; third, the *reconsiderations of conventions* that inevitably arise from such explorations; fourth, the *shared responsibility* of author and reader in all this. Together, these aspects constitute the theoretical basis for new media poetry.

Given the nature of the communication channels employed in new media poetry — e.g., computer, video, hologram — the signs out of which the poetic text is (to be) constituted are immaterial. The virtual domain of this poetry "exceeds all the more or less established techniques of channeling poetic messages, because it breaks in a definitive way with the first support that produces and maintains them: real physical space," Argentinian poet Ladislao Pablo Györi writes.[6] This break is really a dramatic one; it opens up a world of new possibilities for the composition and combination of signs and for their electronic manipulation. (For brevity's sake, we refer to other essays in this anthology for examples.)

As new media poetry centers on the exploration of these possibilities, it may appear that the channels employed are its constitutive source all by themselves. But in fact, they

5 Perhaps we should have said: there is no text-*sequence* without the reader constructing one. But then again, what definition of "text" in the ordinary, verbal sense of the word does *not* implicitly or explicitly rely on some notion of sequentiality?

6 Györi, Ladislao Pablo. 1995. *Criteria for a Virtual Poetry.* Buenos Aires [self-published broadsheet].

7 Bolter. *Writing Space,* 37, our italics.

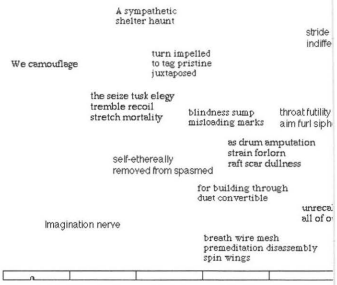
8 Landow, George. 1992. *Hypertext. The Convergence of Contemporary Critical Theory and Technology.* Baltimore, Maryland: Johns Hopkins University Press, 37-40.

9 Another lesson is that to adopt new media is not necessarily to adopt them as a writing space in Bolter's sense of the word. The second, not the first, is what counts in new media poetry.

are only part of the story. What is really at stake here, in Bolter's words, is that "[t]here is a *dynamic* relationship between the materials and the techniques of writing, and a less obvious but no less important [and no less dynamic] relationship between materials and techniques on the one hand and the genres and uses of writing on the other."[7] Particularly the second of these relationships is crucial for new media poetry. But one should keep in mind that Bolter's dynamics are not automatisms!

We referred earlier to the many poems drifting in cyberspace that would work just as well in a print environment. The poetic conventions and writing strategies that underlie their composition have nothing to do with the medium through which they are transmitted. Similarly, a Shakespeare sonnet does not become a hyperpoem merely by including it on a hypertextually organized CD-ROM. Even Tennyson's "proto-hypertextual" *In Memoriam*, a poem that "anticipates electronic hypertextuality," had to be "adapted" in order to work in its new environment of the intermedia web created by George Landow and his students at Brown University — the quoted terms are all Landow's.[8] The inclusion of links required decisions on what parts of the text should be linked with what other parts and with what other texts, and this, in turn, required reflections on context, poetic codes and conventions, literary history and the reading process. A holopoem, in Eduardo Kac's conception, is typically *not* a holographic rendering of an ink-and-paper based text; a videopoem is typically *not* a videotaped reading or video scanning of printed poetry.

The most significant lesson to be learned from these and similar observations is that the channel and other constitutive factors of the process of poetic communication should not be conceived of as independent units.[9] On the contrary, the relevance of innovations with regard to the channel of literary communication depends on the influence of such innovations on other factors. These factors go from the employed codes (including generic codes) and the syntax of poetic texts, via the newly generated possibilities of semantic valuation thereof, to the pragmatics of poetic communication and the experiences integrated therein. *Exploring the very interrelationships of all these aspects* could be considered an overall objective of new media poetry.




It is in this respect that the immateriality of new media poems truly transforms the field of poetic communication. There are two main reasons for this. First, the conditions for such exploration prevalent in virtual writing spaces are unavailable in a print environment, or only available to a very limited extent. Their employment triggers a revaluation of potentially every convention on the level of sign construction. Consequently, *new* interrelationships between the aforementioned aspects of poetic communication arise. Second, in responding to the new media poem, the reader therefore cannot but engage in a similar revaluation. In their immateriality, the explorations of new media poetry may thus offer a new perspective on language itself and, ultimately, on our verbal behavior. Let us now consider each of these points in a little more detail.

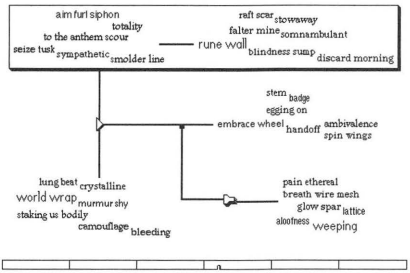
It follows from the above that in new media poetry the poetic texts will be endowed with features that are *unique* to the virtual environments in which they are written and read. Surely one of the most important of these features is variability. Jim Rosenberg's hyperpoems, Eduardo Kac's holopoems, Melo e Castro's videopoems and other works represented in this anthology are all characterized by a fluctuation and change that cancels the self-contained invariability of printed texts.

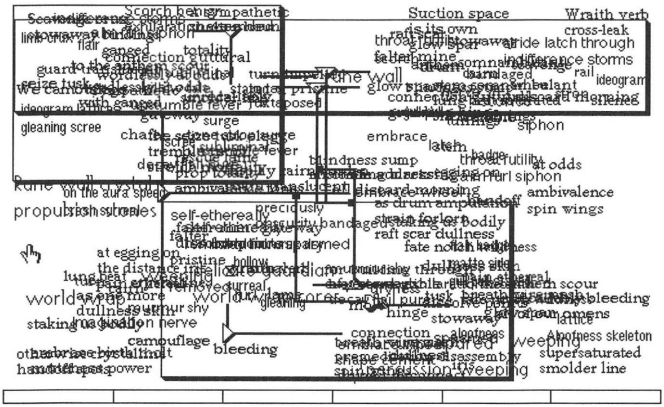
In Rosenberg's poems, as in all hypertexts, the reader has to find his/her own textual path by navigating through a web of linked lexia.[10] In theory, this already questions the validity of the concept of *the* literary message as a syntagm of textual units presented in fixed and permanent linear sequence, transmitted in a process of literary communication from author to reader. But in practice, at least according to Rosenberg.[11] "hypertext does not go nearly far enough." The reference is to those hypertexts

10 The complexity of that web and the possibilities of navigation differ substantially from hypertext to hypertext, depending on such factors as the number of lexia and links, or whether or not there is a fixed "beginning," or whether it is a "read-only" text or allows the reader to construct links and change lexia, and particularly on the way in which the hypertext is organized: with fixed links, random links or conditional links.

11 Rosenberg, Jim. 1991. "Openings: The Connection Direct. Personal Notes on Poetics." On line via http://www.well.com/user/jer/openings.html

12 Unpublished as yet, but see http://www.well.com/user/jer/diff.html for an example. Rosenberg's characterizations of the hypertextual principles involved in this work are quoted from "Navigating Nowhere / Hypertext Infrawhere"; cf. http://www.well.com/user/jer/NNHI.html



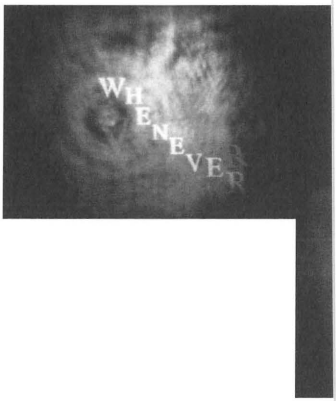

(Left page)
**Figure 1**a.
*Diffractions through #* 2, layer 1
Jim Rosenberg, 1995
screen image

(Above)
**Figure 1**b.
*Diffractions through #* 2, layer 4
Jim Rosenberg, 1995
screen image

(Right)
**Figure 1**c.
Diffractions through # 2,
simultaneity
Jim Rosenberg, 1995
screen image

whose individual statements or lexia comply with the syntagmatic rules of the natural language in which they are written. As Rosenberg continues, the non-linear discontinuity (or discontinuous non-linearity) that characterizes hypertext as an organizational principle "should be extended all the way down into the fine structure of language. Syntax itself can operate through the same kinds of operations as the hypertext link." For example, in his *Diffractions Through*[12] Rosenberg includes both polylinear lexia, characterized by "the stringing of word skeins in a graphical space where normal print conventions establish no clear ordering among the skeins," (*figure 1a*) and "relational syntax diagrams" (*figure 1b*) as "planes" of the poem's hypertextual simultaneity, i.e., "the literal layering on top of one another of language elements" (*figure 1c*). Verbal strings, scattered text chunks, diagrammatic schemes and spatial layers all work together to shape the poetic writing space in which the reader has to find his/her route. Needless to say, this route will vary from reader to reader, and from reading to reading.

Variation and change take place in time; the introduction of time as a feature *of* the written text is another innovation uniquely realizable in the new media writing spaces. Time and time manipulation are explored in various ways throughout new media poetry, particularly in Melo e Castro's video poems, in Kac's holopoems and in the animated poetry of authors like Jean-Marie Dutey, Patrick-Henri Burgaud, Tibor Papp, Philippe Bootz.[13] It must be stressed that this time is genuine — albeit virtual — text-time, not real time, as in poetry performance, nor read-time. In fact, text-time and read-time need not coincide at all — for instance in looped videos, or in works with reversible time vectors — and precisely that will then be one of the operative factors of the poems at stake. But then again, read-time may determine text-time: in all of Kac's holopoems, the duration of momentary configurations of the texts and the tempo of their transition depend on the (eye-) movements of the reader through time as well as space.




The employment of such features as variability, fluctuation and temporality will result in a *reconsideration* of communicative habits, with more or less dramatic results. This concerns not just conventions of poetic writing, for instance with regard to prosody or poetic closure — it particularly concerns conventions of verbal communication and its organizational infrastructure in general, for instance on the levels of graphematics, morphology and (text-) syntax.

For Rosenberg[14] and many others involved with hypertext literature and poetry, phrase structure is the bottom line when it comes to hypertextual organization of language. But evidently, other orientations are feasible. Eduardo Kac's *Storms* is a poem that *does* take hypertextual organization to the level of morphologic and graphematic structure, with links that blend one word into another: "scene" into "scent," "face" into "trace." Kac's orientation is towards "motion, displacement and metamorphosis."[15] This is particularly clear in holopoems such as *Adhuc* (cf. *figures 2a to 2f*), in which the constituent letters of a fairly limited number of basic words float through holographic space, generating a realm of morphologic possibilities.[16] Now, as one word turns into another on the computer screen or

13 See especially the electronic journal *Alire* (Paris: L.A.I.R.E.) for samples of this animated poetry.

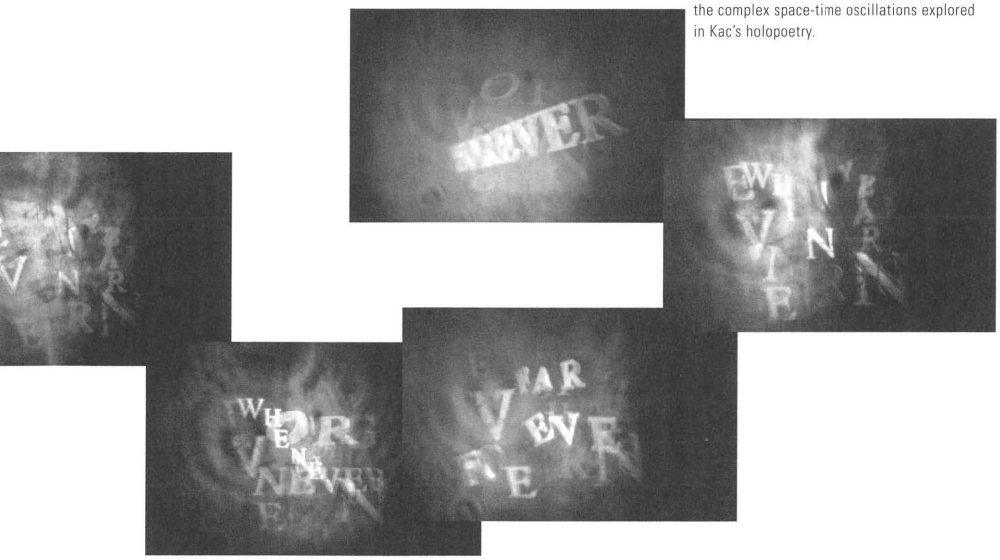
14 As he writes in "Non-Linear Prosody": "Even I would balk at taking hypertext inside the word. The words are given to us, by and large; it does not seem reasonable to me to intervene in that natural process with an external administration of hypertext structure."

15 Kac, Eduardo. 1995. *Holopoetry. Essays, manifestoes, critical and theoretical writings.* Lexington, Kentucky: New Media Editions, 64.

16 Kac. *Holopoetry*, 49. "Still"' images from this and other holopoems are included on Kac's www site [http://www.uky.edu/FineArts/Art/kac/kachome.html).

17 Bootz, Philippe. 1994. "Poésies en machinations." In: *Littérature*, vol. 96, 65. See also his contribution to this anthology.

18 Bootz. "Poésies," 68



**Figures 2**a to 2f
*Adhuc*
Eduardo Kac, 1991
These six photographs of the holopoem *Adhuc*, taken from six different angles, reveal the complex space-time oscillations explored in Kac's holopoetry.

within the holographic space, the most intriguing question is: what happens in between? Merely to state this question, to suggest that this notion of in between could be imported into the framework of linguistic organization means to reconsider much of what we thought we knew about the language we are accustomed to use.

Commenting on the text generators developed by members of the French group L.A.I.R.E. and other authors, Philippe Bootz suggests that we can no longer uphold the concept of a "text written to be read."[17] Rather, it dissolves into a "text-written" (*texte-écrit*) and a "text-to-read" (*texte-à-lire*) or, alternatively, a "text-to-see" (*texte-à-voir*). The "text-written" is not to be confused, as Bootz emphasizes,[18] with the storyboard or the computer program for the generator. Rather, it is an "abstract structure compiled of a logic applied to the functional rules of conceptual material," usually language. Although text-written

and text-to-read are closely entwined, their syntactic status thus differs completely, at least according to Bootz's conceptualization. Grammar, in particular, only applies to the latter, for "grammar is an element of the material and not of the logic of functioning," Bootz writes. But obviously, that logic determines the syntactic structure of the text-to-read. What, then, is the status of that syntax? It is an aspect of a "modality of realization" (*modalité de réalisation*).[19] Couldn't we read "modality" here in the logical, grammatical as well as procedural sense of the word? In any case, Bootz's comments on text generators point to the interdependence of these three levels. The consequences thereof need to be considered in a revaluation of our views on *the* structure of language and of poetic texts.

Poetry/text generators such as Pedro Barbosa's and Abílio Cavalheiro's *Sintext*[20] — offered to the reader as a computer application that combines a choice of fifteen source texts with permutational procedures, some parameters of which can be set by the reader — evoke fundamental questions with regard to the identification of *the* text, as a syntagmatic construction. Is every generated text a self-sufficient unit? Or are they, rather, samples of *the* text, which should be regarded as an indefinite or even infinite continuum of possibilities? Is the source text or vocabulary part of *the* text? Whoever is inclined to answer the latter question with a straightforward "no" should be reminded that the selection of that source is of crucial importance for the outcome of the generative process. Quite possibly, there are no straightforward answers to these questions — all answers depend on perspective, and recognizing that may be an important part of the generated text's meaning. Again, all this has far-reaching consequences for what we believe to be texts and for what we believe we can do with them.

Finally, as the contemplation of the interrelationships, features and evoked transformations of conventional views sketched in the above are part and parcel of the process of poetic communication, the realization of this process

19 Bootz. "Poésies," 69.

20 Barbosa, Pedro and Abílio Cavalheiro. 1994. "Sintext. Gerador de Textos" [1993/94]. *Alire* 8. Paris: L.A.I.R.E.

21 Less elementary, the reader always has an interpretive task, in print as well as new media poetry. The difference between the two lies in what is offered for interpretation.

22 Kac. *Holopoetry*, 113.

becomes a *shared responsibility* of poet and reader. At first sight, this may appear to be nothing new. In a sense, the reader has indeed always been the one to decide whether or not a poem or any other text can fulfill its communicative function, for instance in the very elementary sense that he or she must decide whether to read a text or leave it *un*-read.[21] But that comes uncomfortably close to the view on communication that new media poetry (and experimental literature in general) challenges; the view that holds that communication is the transmission of a "meaningful content" through some message that the "receiver" has to accept for the communication to succeed. In new media poetry, as we see it, an entirely different *rapport* between author and reader prevails.

In new media poetry communication becomes negotiation. It is not the text that fulfills its communicative function or fails to do so. Rather, the merging activities of poet and reader fulfill poetic communication, and in that process a poetic text is created. The previously indicated characteristics of new media poetry, from the navigation through hypertext webs to the modalities of computer generated poems, all point to the same conclusion that Eduardo Kac draws from Baudrillard's philosophy of the media:[22]

> If something is totally predetermined there's no communication. It is nothing but unilateral transmission. Communication must imply openness.... When Baudrillard talks about restoring responsibility to the media,... it refers to the social responsibility that the media have, but it also opens up the idea for the artist to restore the responsibility of the media, in the sense that the media must allow people to respond,... to interact, to share, to discover together, rather than be at the end as consumers.

## New media poetry - some writing strategies

By way of example, and thus far from pretending to develop an exhaustive typology of forms of new media poetry, let us now briefly consider some writing strategies developed in this poetry. The poetical focus is on syntax, on the procedures involved in the production of signs, and on the employed sign continuum, respectively. Of course these are abstractions from tendencies — in practice, poets will amalgamate and vary such writing strategies. Their momentary distinction may be useful in order to show some of the fundamental means and methods used in new media poetry.

New media poetry often relies on the *confrontation and integration of various syntactic systems* — not so much in the sense of combining various natural languages (although that may be the case), but of integrating altogether different types of syntactic organization. This, in turn, undermines these organizational structures. In fact, it would not be too far off to envisage new media poetry as a collective attempt to *challenge the notion of the syntagm as something given*, particularly as something determined by the conventionality of a single, unequivocal syntactic system and also as something *not* determined by choices of the reader.

We have already hinted at this when we discussed hypertext poetry and poetry generators. Other examples are ready at hand. Many new media poems involve the *juxtaposition* of verbal — and other — elements, whether in two dimensions or three (for instance, in some of André Vallias's multimedia digital works) or four (the latter in most of Kac's holopoems). When regarded as the complete absence of any syntactic structure, a "structural zero" in Jim Rosenberg's terms,[23] juxtaposition is disjunctively opposed to syntagmatics. But the new media writing spaces allow for other combinational procedures than verbal syntactic structure only, e.g., hypertext links, (virtual) diagrams, holographic metamorphosis, video transformations. As unresolved, or not-yet-resolved, structural relationships, these enable an *interplay between* rather than a diffusion of various possibilities of text construction. Thus conventional verbal syntax "becomes an option but not an obstacle," Rosenberg continues; "poetry is given the openness that has been taken for granted in the other arts for decades, without giving up the richness that syntax provides as a vocabulary of structural descriptions."


**Figures 3**a, 3b, and 3c
*Insect.Desperto*
Eduardo Kac, 1995
In an attempt to capture the dynamic quality of Kac's "Insect.Desperto," these three photographs were shot off the computer screen with the piece running. These three images do not reveal static configurations, but instances of fast-paced apparitions.

23 Rosenberg. "Openings."

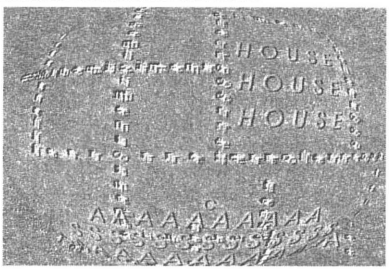
24 It is impossible to reproduce even an aspect of this work accurately in print. Kac's www site (cf. note 16) gives access to the poem. The images of the poem reproduced here were shot off the screen with shutter open, in an attempt to represent the passage of time.

25 de Melo e Castro, E.M. 1996. "The Cryptic Eye." In: Jackson, K. David, Eric Vos and Johanna Drucker, editors. *Experimental, Visual, Concrete. Avant Garde Poetry Since 1960*, Amsterdam/Atlanta: Rodopi. "Infopoetr"' is defined by Melo e Castro as "poetry made with the use of the computer"; it "thus adds the virtual reality of the poetic images to the virtual, dematerialized substance of the synthetic imagery and writing produced by the computer." In doing so, *The Cryptic Eye* relies on the computer's capability to create a video image.

A complex example of the combination of various syntactic possibilities can be found in Eduardo Kac's *Insect Desperto*.[24] In a very rapid succession of flashes (*figures 3a, 3b, 3c*), that revert direction halfway through the poem, English words and brief phrases appear, disappear and reappear, scattered over the computer screen, while a spoken, synthesized Portuguese text is heard. The confrontations here are simultaneously between visual and aural language, between spatial and temporal development, between various natural languages (taking linguistic capacities and incapacities of the reader/viewer/listener into account), and between linear and non-linear verbal processes. While, as Kac writes in the "ReadMe" file accompanying this poem, "the elusive movement of the words on the screen can be read in many ways," for instance as "unresolved hesitation concerning the construction of syntagms" but also as "reflecting the fleeting behavior of flying insects," its combination with the temporo-linear Portuguese text doubles the "evoke[d] inconsistencies and undecided aspects of life," verbal and otherwise.

New media poetry often involves a confrontation of *continuous and discontinuous systemacies*. The ordinary verbal syntagm, grounded in the alphabet, is always a combination of discrete units (letters, lexemes, phrases, etc.), whereas, for instance, the video image covers the whole range from radical fragmentation, e.g., in montage, to total density, e.g., in color transformations. Every attempt to reconcile or negotiate these systemacies implies that our semiotic habits need to be reconsidered. As Melo e Castro writes with regard to his series of "infopoems" *The Cryptic Eye*: "A counter-semiotics will be required to establish new and unexpected relations between the tools and the means we use to communicate: the words and the colors."[25] The juxtaposition of words in English and Portuguese as part of the color spectrum in the computer-video image" address[es] the question of readability and, ultimately, our capacity to read by using our eyes" (cf. *figures 4a and 4b*).

**Figures 4**a and 4b
*The Cryptic Eye*
E.M. de Melo e Castro, 1995


New media poetry finds one of its pillars in the *interactive production of text/sign units*. An extreme ex-

ample of the interactive poem (or narrative text, for that matter) is the one that, literally, does not exist *as* a readable text without a reader's act.[26] In their simultaneity, Rosenberg's poems are almost completely illegible — they require the reader to reconstruct legibility through selecting text planes. In Kac's holopoetry, the reception process required for the production of a readable text involves a range of physical and sensorial activities. What text the reader/viewer sees depends entirely on his/her physical position relative to the hologram and, especially, on his/her body and eye movement:[27]

> When the viewer starts to look for words and their links, the texts will transform themselves, move in three-dimensional space, change in color and meaning, coalesce and disappear. This viewer-activated choreography is as much a part of the signifying process as the transforming verbal and visual elements themselves.

Undermining the concept of the text or even the verbal sign as something given, something preordained, such works exemplify the reader's part in bringing the poem, its text and its meaning into existence.

One might be inclined to object that this latter observation overlooks the fact that the reader's activities are always limited by parameters set by the poet. The choice of words or letters, their number, their relative position within the holographic or screen space, the size of that space — all these determine the choreographic playground of the reader at least to some extent. But first of all, this only points to the *shared* responsibilities of poet and reader in developing a process of poetic communication. And furthermore, expansions of that playground can be conceived quite easily.

One already often explored possibility is to subdue the mentioned parameters to chance, through *aleatoric devices*. Of course aleatorics have been employed in poetry before the new media were available, but the computer, for instance, opens up many new vistas in this respect. An example can be found in the collaborations between Kenneth Sherwood and Richard Kostelanetz on their *Monopoem Workings*.[28] First, Kostelanetz's monopoems — single word texts that serve as a source vocabulary — were "sent through a series of near-random cut-paste and alphabetization procedures" offered by an ordinary word

processor. Then, the resulting texts were "amplified ... in accord with the computer's ear," expanding them "by addition of words that a standard word processor designates as phonetic matches." But what word processor — and in which language? Just suppose that not only the source and resulting texts of these "workings" but also its program were down- loadable (and what could the technological impediments to that be?). Suppose that the "workings" would continue on our personal computers. Then the resulting texts would differ from computer to computer, as the poem makes use of, or at least could make use of word processor's dictionaries compiled by their individual users, the readers of the poem, all in their own language. Telecommunications and tele-presence installations could be added. It would even be conceivable to let a poem lead a virtual life of its own on the Internet, through procedures similar to the ones employed in artificial life projects. The ongoing development of the work, i.e., the continuous change of the parameters once set by its author, would then depend on such factors as the number of readers who care to connect to this poem and the size of the disk space they wish to provide it with. Language acquires yet another form of being!

These and quite a few of the aforementioned examples point to yet another writing strategy of new media poetry that we want to mention here: the *effectuation of sign behavior*, particularly motion. The Dutch-French poet Patrick-Henri Burgaud employs computer *animation* on the most fundamental of all writing levels, *graphematics*, in his poem *La Mer*. The noun phrase "Les vagues de la mer" is performed (that seems to be the right word) in what one could call animated calligraphy, and its complying verb phrase "dansent au chant des pierres" in a print-like screen font (cf. *figures 5a to 5e*).[29] Burgaud is well aware that implementing motion on this basic level is not so much a goal in itself but a means to achieve new expressive possibilities on all levels of poetic communication.[30]

> Animated poetry allows the exploration of all sign virtualities. The letter is no longer a zero space, non significant, absent. It is an image, a form that may be charged with meaning and values. This provides a range of opportunities to amalgamate word and image, from stylized pictograms to highly realistic representations. Motion, spatio-temporal development allows the introduction of a novel informative element, a narrative or discursive dimension that in turn orients and enriches the reading process.

26 It does of course exist *as* — digital — information stored on a computer disk or other storage medium.

27 Kac. *Holopoetry*, 85.

28 See http://wings.buffalo.eud/epc/rift/rift01/kost0101.html; Sherwood's following comments on "Monopoem Workings" are quoted from this source.

29 "The waves of the sea/dance to the song of stones." The "floating" letters of the first phrase, especially the bird-shaped "v" and the surf-like "m," and the print-like blocks of the second phrase are clearly linked with semantic values. Realized in collaboration with Jean-Marie Dutey, this poem is included in *Alire* 8.

30 Burgaud, Patrick-Henri. 1995. "Multimediapoëzie/La poésie multimedia"" Lecture presented at the Hogeschool voor de Kunsten at Arnhem, the Netherlands. Our translation.

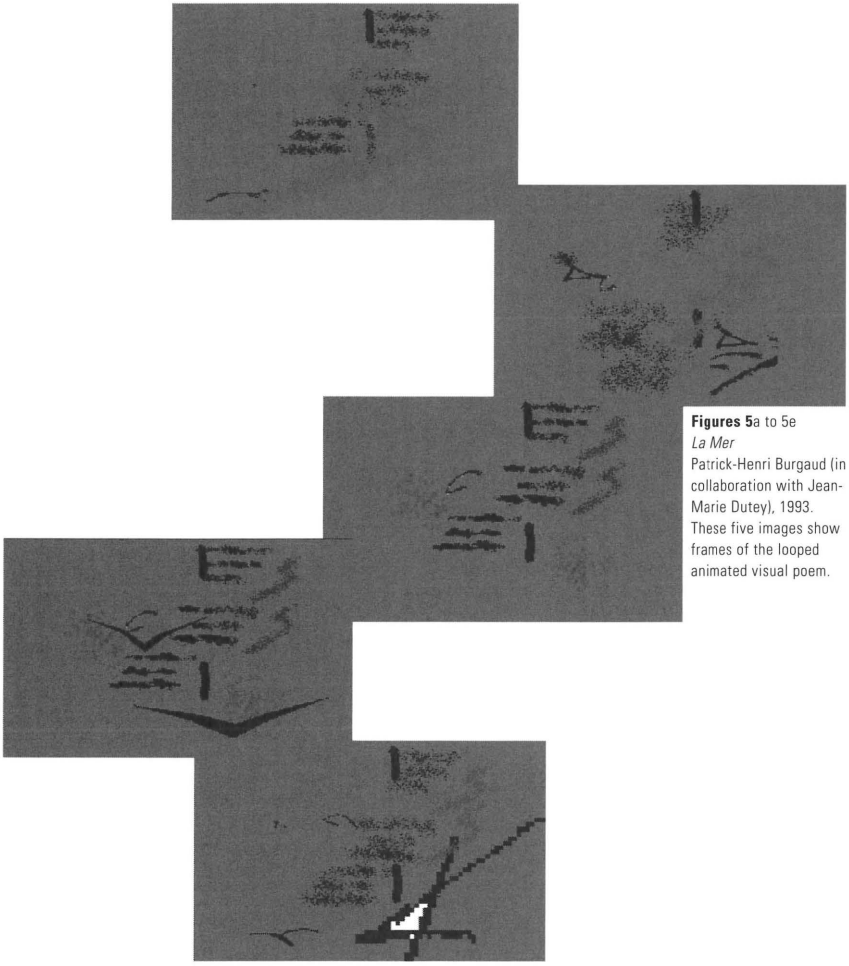
Others, for example Philippe Bootz in *A bribes abbatues*,[31] use *animation* as a *morphologic* and *syntactic* device: word parts and phrases move over the computer screen to combine into new words and phrases, to change from nouns to adjectives or verbs and so on. William Dickey's tripartite description of the condition of electronic writing as tentative, fluid, changeable can, arguably, be exemplified no more literally than through this poetry.

All in all, it appears that many of the new media poetries, as they go all the way down into the fine structure of language as Rosenberg would say, at least in part aim at *repletion of the verbal sign*. They stress that there is, indeed, a sign *continuum*, out of which our verbal signs are distilled. This proto-semiotic environment is fully replete; it does not discriminate between sign features that are and those that are not charged with a semiotic function. But verbal practice is different. Considerations of shape, color, permutation, position in and movement through time and space and other such qualities of the written sign are perhaps not entirely neglected in the institutionalized writing spaces of printed texts, but they are certainly codified into patterns that seem to reward us for *not* paying attention to these non-alphabetic aspects of our languages. Nonetheless, these are the aspects that directly link our languages to the sensorial procedures through which we achieve understanding of the environments in which we live. The reward, allegedly, comes in transparence, clarity, unequivocality, rapid understanding, stability, vindication, authority. But there is also a loss of potentialities, of a potential understanding of both language and the world in which it is used as spaces in which we need *all* our sensorial capacities in order to find our way, or rather: in our never ending attempts to find our way.[32] The signs of Rosenberg's simultaneities, Kac's holopoems, Melo e Castro's video poems, Burgaud's computer calligraphics, Györi's virtual poetry, Bootz's animated texts, Cayley's cybertexts, Vallias's digital and diagrammatic works and a rapidly growing number of other media-poetic innovations restore a part of that loss, all in their own way, through their

31 *Alire* 9, 1995. Paris: L.A.I.R.E.

32 This should not be read as a disqualification of print literature; we do not believe that print has exhausted its potential, as quite a few advocates of the new media claim. Still, new media environments allow and in fact invoke the use of sign features that are very hard to employ, if at all, in a print environment.

33 Kac, *Holopoetry*, 85.



**Figures 5**a to 5e
*La Mer*
Patrick-Henri Burgaud (in collaboration with Jean-Marie Dutey), 1993. These five images show frames of the looped animated visual poem.

own channels. As Kac writes: "Language plays a fundamental role in the constitution of our experiential world. To question the structure of language" — through the means offered by the new media — "is to investigate how realities are constructed."[33]

**Selected Webliography**
*Selected webliography compiled and annotated by Eduardo Kac. Special thanks to Jim Rosemberg, John Cayley and Espen Aarseth for their suggestions.*

## Poetry Resources

**Electronic Book Review**
http://altx.com:80/ebr/content.html

*Covering every aspect of traditional book culture in the context of emerging media, this site occasionally also covers literary work that can only be read in electronic formats.*

**The Electronic Poetry Center**
http://wings.buffalo.edu/epc/

*The Electronic Poetry Center provides links to poetic resources produced at the University at Buffalo as well as elsewhere on the Internet. The site is not primarily committed to electronic poetry proper, but to the use of the Web to discuss poetics and to publish essays on the topic.*

**Telepoetics**
http://www.tezcat.com/~malachit/index.html

*Since 1993, performing poets across the country have been incorporating accessible videophone technology in their public readings, primarily to link to other sites simultaneously. This Web site documents their work and provides links to other poetry sites on the Internet.*

## Hypertext Resources

**Hypertext at Brown**
http://twine.stg.brown.edu/projects/hypertext/hypertext_ov.html

*Brown University has a strong presence in the hypertext world. This site includes an overview of some of the hypertexts that have been developed at Brown.*

**Eastgate On the Web**
http://www.eastgate.com/~eastgate/Minihome.html

*Eastgate is the leading publisher of literary hypertexts in electronic media in the United States. The Eastgate Quarterly Review of Hypertext often publishes interactive digital poetry on floppy disks.*

**Hypertext & Literary Theory: Essays**
http://aaln.org/~kmm/essay.html

*This site contains links to many other sites on the topic of hypertext and literary theory.*

**Hypertext Fiction and the Literary Artist**
http://www.anima.wis.net//HFLAhome.html

*The Web site discusses the relationship between narrative and the physical form of the book itself.*

**Hyperizons: Hypertext Fiction**
http://www.duke.edu/~mshumate/hyperfic.html

*With many links to essays on hypertext and fiction, this site is a good introduction to the subject.*

Michael_Joyce_378.html

*This site is home to the pioneer of hyperfiction and author of afternoon, a story.*

**Jay Bolter**
http://www.gatech.edu/lcc/idt/Faculty/Bolter.html

*The visitor will find here information about current research by the author of Writing Space. a study of hypertext, the computer annd the history of writing.*

**Stuart Moulthrop**
http://raven.ubalt.edu/Moulthrop/sam_home.html

*Stuart Moulthrop is the author of the fiction hypertext Victory Garden, published by Eastgate.*

**Judy Malloy**
http://www.eastgate.com/~malloy/

*Judy Malloy is a hyperfiction author who is offering a new hypertext entitled /OveOne through Eastgate's Web site. Via e-mail she has defined /OveOne as "a continuing narrative of comings and goings, German hacker artists, computer culture, hardware and software love gone wrong." As new screens are added, to read her piece is to browse the pages of Sarah's diary, making conceptual links between them as this work-in-progress evolves online.*

## Poets' Sites

**Jim Rosenberg**
http://www.well.com/user/jer/

*Jim Rosenberg's home page includes diagram poems, theoretical writings and samples of interactive work.*

**Robert Kendall's Home Page**
http://ourworld.compuserve.com:80/homepages/rkendall/

*This site includes texts about hypertext and multimedia poetry and fiction by the author.*

**Indra's Net: a cybertextual project by John Cayley**
http://www.demon.co.uk/eastfield/in/

*John Cayley's home page includes critical writings and samples of his cybertexts available for downloading.*

**Kac Web**
http://www.uky.edu/FineArt/kac/kachome.html

*A Web retrospective documenting Eduardo Kac's work from 1980 to the present. This site includes color stills of all holopoems, critical writings and some of his digital poems available for downloading.*

**Eyephonics**
http://www.odyssey.com.au/eyephon/art.html

*Information about pioneering electronic sound poets Bernard Heidsieck and John Giorno can be found on this site.*

**OuLiPo**
http://alpha.univ-lille1.fr:28080/~bruhat/oulipo/

*This site documents the Workshop of Potential Literature founded in 1960 by Raymond Queneau and François Le Lionnais.*

**Cent Mille Milliards de Poèmes**
http://www.panix.com/~todonnel/rqueneau.shtml

*In 1961, Editions Gallimard published Raymond Queneau's "Cent mille milliards de poèmes," a book that anticipated many concerns developed by contemporary cybertexts. The lines of the sonnet created by Queneau can be permutated up to 10 to the 14th power, creating one hundred thousand billion poems.*

**A Story As You Like It**
http://fub46.zedat.fu-berlin.de/~cantsin/Welcome.html

*A Story As You Like It is the title of a text by Raymond Queneau developed after the "tree" model of computer programming languages. Originally published in book form, it has recently been programmed as a hypertext.*

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ISSN 0022-2224

Published quarterly 1967-1995. Published triannually from 1996. Index included in the last issue of the volume year.


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