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# The Significance of the Introduction of Electronic Interaction to the History of the Art Object and the Viewer

Mary Anne Farah

A Thesis

in

The Department

of

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Presented in Partial Fulfilment of the Requirements
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By: Mary Anne Farah

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# ABSTRACT

The Significance of the Introduction of Electronic Interaction
to the History of the Art Object and the Viewer

Mary Anne Farah, M.A.
Concordia University, 1995

Since the late 1960s, a new artistic phenomenon--"electronic interactivity" as it is referred to by practitioners--has emerged which is worthy of art historical assessment. As part of such an endeavour, this text examines how electronic interactivity has altered the traditional relationship between art objects and art viewers.

The first chapter covers some of the twentieth century art movements that contributed to the emergence of different forms of viewer participation with artworks. The second chapter presents a compilation of the ideologies that have motivated many interactive artists to create work that is dependent on viewer participation. In addition, it provides a dialogue about how viewers have responded to interactive artworks and some associated problems. The third chapter expands upon the definition of "interactivity" by combining artists' and writers' definitions with the author's. This understanding of interactivity provides a spring board to present two main methods for electronic interaction in art in the final chapter--"pathway/explorer" and "cocreator". Both of these terms are used to separate different modalities of information exchange between artworks and art viewers.

# ACKNOWLEDGEMENTS

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# INTRODUCTION

Throughout the past one hundred years, artists have introduced technologies to the art world in forms such as photography, cinema, video, and electronic multi-media systems, thus fulfilling a notion of the artist's role as a "visionary" popularized by media philospher Marshall McLuhan in his 1964 text Understanding Media - The Extensions of Man.[1] Thoughts that reflect this eminent Canadian's views have continued to be developed, as revealed in Brian Slawson's 1993 article, "Interactive Multi-Media: The Gestalt of a Gigabyte." Slawson writes:

> A unique contribution of artists and designers from any culture or period is their expert, practised ability to create, interpret, manage and communicate ideas carried by media--be that the written word, a voice, a moving body, or paint on canvas. What group could be better able to pioneer new modes of creative expression on the changing frontier of contemporary technologies?[2]

Through the examination of contemporary interactive artwork, it is evident that the artists involved are attempting, more intensely than ever, and as McLuhan had desired, to use various technologies to explore the creative boundaries inherent in new media.

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[1] Marshall McLuhan, Understanding Media - The Extensions of Man (New York: McGraw Hill Book Co., 1964), 70-71, 75, 215.

[2] Brian Slawson, "Interactive Multi-Media: The Gestalt of a Gigabyte," Art Education 46, no. 6 (November 1993): 20-21.

With the incorporation of modern technologies into the field of art, a new artistic phenomenon has emerged, one which permits viewers to make contact with artwork in ways never before witnessed in the history of art. Since the 1980s, this contact generally has been referred to as "interaction." Given that interaction is a relatively new artistic venture, a new method of art criticism, appreciation and analysis is needed in order to grasp its characteristics and effects. Unfortunately, new phenomena tend to be interpreted through older ideologies.[3] In other words, although it may be natural and automatic for us to use the pre-established analytic criteria that have derived from the investigation of other media to judge novel works of art, it is often inappropriate to do so, most especially in the case of interactive art. Instead, Montreal-based interactive artist Don Ritter maintains that interactivity should be recognized as a new art form. He explains that when trying to situate interactive work, critics have often grouped it with pre-established art forms, "They say, 'Oh, this is really video.' 'This is really film.' 'This is really music.' Well, it's none of those. It's a responsive environment."[4]

*Defining Interactivity in Art*

The Random House College Dictionary (1982) defines the verb *interact* as the following: *to act one upon another*, whereby *act*-ing is *the process of doing; to do something, exert energy or force; be employed or operative; to produce an effect. Inter* is defined as

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[3] For example, in the early years of the cinema, it was referred to as moving *pictures.*

[4] Don Ritter, interview by author, 22 February 1992, Montreal, tape recording, held by author.

*between, mutually,* and/or *reciprocally.*[5] As art educator Brian Slawson states, "'interactive' suggests the ability of the 'reader' to control or modify the sequence and structure of experience."[6] But interaction is not a new phenomenon. Humans have been interacting through sophisticated verbal and physical languages since the beginning of humankind.

What then constitutes interaction within a work of art? Simply put, I would argue that interactivity in art involves the necessity for the viewer to affect the work through his/her bodily movements (including voice). The viewer is therefore responsible for affecting and hence completing the composition of the work.

Such a definition of interactivity is, however, not reducible to viewer affectation. To be questioned, for example, are works that are labelled "interactive" but do not *actively* respond to the actions of the viewer. Drawing the Line - an Interactive Lesbian Photo Exhibit by artists Susan Stewart, Persimmon Blackbridge and Lizard Jones, held April 5 - 22, 1989 at A Space in Toronto (see illustration 1) claimed to be "an interactive photography exhibit... [in which] 100 black and white photographs of lesbian sexuality form a series, ranging from least to most controversial. The viewer was asked to comment on the images and [literally] 'draw the line' where they put their limits regarding sexual imagery."[7] According to the artists, the act of drawing and writing

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[5] Random House College Dictionary, rev. ed. (1982) s.v. "interact" and "act".

[6] Slawson, 17.

[7] Drawing the Line, Information sheet distributed as part of the "Drawing the Line" exhibition, A Space Gallery, Toronto, 5-22 April 1989.

on photographs was considered to be an interactive experience. But did this work actually "interact" with viewers? I would argue that it was *created by* viewers; the work can be deemed as "complete" at the end of the exhibition, not during the act of mark-making. Although Drawing the Line permitted viewers to make physical contact with it, the work remained passive through its lack of "action analysis". In this light, the labelling of this work as "interactive" is questionable.

Another example of the confusion surrounding the term "interactive" can be found in a 1989 exhibition titled Interactive Work. This exhibition, located at the Oakville Galleries in Ontario, included a sculptural work by Juan Geuer titled Self Portrait (see illustration 2). The catalogue for this exhibition outlines the piece's interactive characteristics as follows: "The work stands erect, about the height of the average person, and two stools are provided for viewers of varying heights. We can peer into the 'face' and see a shadowy reflection of ourselves or alternately see through this 'window' to a viewer on either side."[8] It is evident from the above statement that Self Portrait does not qualify as interactive. Merely peering into the centre of a piece does not constitute an interaction; this process does not significantly challenge the traditional role of the physically passive art viewer. What can be viewed as the inappropriate inclusion of this piece into an exhibition devoted specifically to interactive works is indicative of the disorientation that often accompanies the initial phases of a new artistic endeavour.

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[8] Dale Barrett, Interactive Works (Oakville: Oakville Galleries/Gairloch Gallery, 1989), 2.

Furthermore, an interactive work is not only one in which a human being is physically encouraged to touch a work of art; not all works that elicit physical contact can be termed interactive. For example, one should not mistake Bill Viola's 1982 work Reasons for Knocking at an Empty House as interactive (see illustration 3). Although a viewer must sit in a chair and position him/herself between two earphones in order to hear the accompanying audiotrack, the viewer's participation does not alter the presentation of the piece in any way.[9] In an interactive piece, the viewer must be able to affect the composition of the work in some way. Author Regina Cornwell relays that she first learned about the characteristics of interaction with The Erl King (see illustration 4), claimed to be "one of the first interactive art videos." She writes, "To an unnerving degree, I was responsible for what any given group of viewers might see, since, with each touch of my fingers to the small computer touch-screen before me, I was able to direct the images and sounds of The Erl King itself, thus interfering with the flow of the narrative and causing changes in its meaning."[10]

*Resistance to Interactive Art*

The tendency to judge interactive art through the analytical restrictions of older media is observable in many of those encountering interactive art for the first time. Some viewers become disconcerted, even agitated, and issue a cry that has been heard

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[9] Admittedly, one could argue that the act of sitting within the chair and positioning one's head within the earphone set-up is the rudimentary act behind the ambiguous "on/off' interactivity classification that is mentioned in Chapter 4.

[10] Regina Cornwell, "Interactive Storytelling," Art in America 76, no. 1 (1988): 43.

many times in relation to art movements during the twentieth century--"This isn't art!"[11] In this manner, interactive art joins a "tradition" that breaks decisively with traditions. Yet, there is no historical precedent for the ways that interactive art has affected the art viewer/art object relationship.

Interactive art and the more broadly qualified genre of "electronic art" have met with resistance over the years by both the public and art centres. Even in university art and art history departments, the inclusion of electronic media has been seen to threaten the cohesion of pre-existing curriculums and professorships. A documented case of such resistance is presented by writer Jim Pomeroy in his text "Black Box S-Thetix":

> When a colleague photographer sought to develop a computer lab for digital imaging in the Art Department of a major West Coast university in 1986, he was stalled until he approached the Engineering College for help through the major corporate grant they had just been awarded. Shortly after, he discovered that the senior art faculty had secretly resolved to bar computers from the department curriculum. Clearly, they felt that traditional art pedagogy was threatened by visual electronics, viewed as a violation of sacred craft and media, and as an intrusion from alien realm of science and industry. ... Such mutually exclusive attitudes further attenuate the narrow landscape for artists working within technological culture.[12]

Art historian James Elkins agrees with Pomeroy, and further believes that his own colleagues are to be faulted for neglecting this field:

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[11] See You Call That Art?, 29 minutes, Washington, PBS Video, 1978, videocassette. This video encourages the understanding of new forms of impermanent, democratic and environmental art.

[12] Jim Pomeroy, "Black Box S-Thetix: Labour, Research and Survival in the He(Art) of the Beast," in Technoculture, eds. Constance Penley and Andrew Ross (Minneapolis: University of Minnesota Press, 1991), 277.

> In particular, art historians are wary of the "high-tech" look of computer-generated images, and they tend to keep away from them for that reason alone. In a sense, this is a self-fulfilling prophecy: as long as the majority of art historians shy away from computer art, the historical discourse surrounding the new images will remain an impoverished 'ghetto.'[13]

Even in the mid-1990s, interactive artworks are still an unusual or freakish element in most undergraduate art history department curricula, thereby reflecting the eccentric positioning of this genre of work in programs devoted to educating the public about "Art".[14] More prominent in art history programs is the continued presentation of static, historically-recognized artworks that are amenable to simple slide documentation and instantaneous recognition.

As a response to the aforementioned situations, this thesis examines some of the issues surrounding "interactivity" in art. To initiate this project, the first chapter will cover some of the twentieth century art movements that contributed to the emergence of different forms of viewer participation with artworks. The second chapter will present a compilation of the ideologies that have motivated many interactive artists to create work that is dependent on viewer participation. In addition, it will provide a dialogue about how viewers have responded to interactive artworks and some associated problems. The third chapter will expand on the definition of "interactivity" by combining artists' and writers' definitions with my own. This understanding of

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[13] James Elkins, "Art History and the Criticism of Computer-Generated Images," Leonardo 27, no. 4 (1994): 336.

[14] Electronic art, particularly interactive art, has been pigeon-holed through its classification as a hybrid subject--'art that uses technology.' Unfortunately, viewing interactive art as an eccentric area of investigation keeps it on the fringe of mainstream art education.

interactivity will provide a spring board to present two main methods for electronic interaction in art in the final chapter--"pathway/explorer" and "cocreator". Both of these terms will be used to separate different modalities of information exchange between artworks and art viewers.

To provide support for these chapters, I have relied heavily upon the work and writings of such Canadian artists as Luc Courchesne, Greg Garvey, Myron Krueger, Nancy Paterson, Don Ritter, David Rokeby and Norman White. These sources are supplemented by input from several international artists including Lynn Hershman, Jeffrey Shaw, Steven Wilson and Roland Brener, in recognition of the fact that interactive art is an artistic practice that cannot be circumscribed by national borders. Even a rapid perusal through the International Directory of Electronic Arts 95/96 substantiates the breadth of interactive art undertakings around the world.[15]

[15] International Directory of Electronic Arts 95/96 (London: John Libbey Publishers, 1995).

# CHAPTER 1

## PRE- AND EARLY "HISTORIES" OF INTERACTIVE ART

### The Traditional Relationship Between the Art Object and Viewer

Knowledge of the history of art and experience with the manner in which art objects generally are treated lead one to certain conclusions about the normal relationship between art object and art viewer in what has come to be called the "Western tradition". The accepted practice amongst museum and gallery goers is to situate themselves in front of, or around, a work of art. Art viewers spend varying amounts of time absorbing diverse elements of work with their senses, interpolating ideas about the cues provided through their personal experiences. Greg Garvey, a Montreal-based interactive artist, describes this experience in more detail:

> The viewer initially sees the painting [or sculpture] at a distance, then perhaps walks slowly forward, first appreciating gross forms and effects of colour. The viewer randomly accesses detail presented simultaneously but each is consciously apprehended as eye fixations dart from here to there. Details of texture are rapidly juxtaposed against larger features as the viewer dances this choreography of perception.[16]

Historically, information has been transferred from art object to art viewer. The traditional viewer has been the terminal point in assembling the messages presented by the artist,

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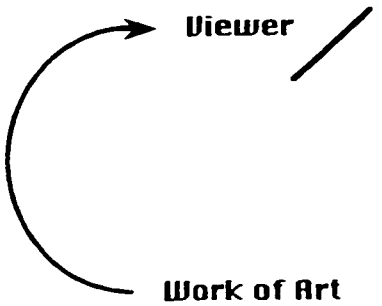
[16] Greg Garvey, Thoughts on Interactivity, [8 August 1995], typescript, [1], held by author. Greg Garvey is an Assistant Professor in the Department of Design Art at Concordia University, Montreal. Garvey has received considerable international recognititon for his interactive work Automatic Confession Machine (see illustration 62).

playing an active cognitive role in their interpretation. Works labelled *non-finito*, or unfinished, such as Rembrandt's Artist and Model of 1639 (see illustration 5), accentuate the importance of the viewer for the conceptual completion of a work of art.[17] However, static works like these, despite their attempts to engage the viewer's mind, do not permit anything other than the viewer's cognitive activity. Garvey agrees, "The epistemiological truism that the viewer completes the painting implies a collaboration between viewer and author although the painting may be described as passive, indifferent, fixed, complete and inert."[18]

**Traditional Relationship Between Art Object and Viewer**




*Viewer Cannot Affect the Composition of the Work*

*Viewer's Involvement is Interpretation and Emotional Response*

However, art viewers' options for participation have generally been limited. Although scores of art historians have written about how artworks attract and engage viewers' attentions, rarely have they had the opportunity to write about artworks where in-depth, *physical* contact

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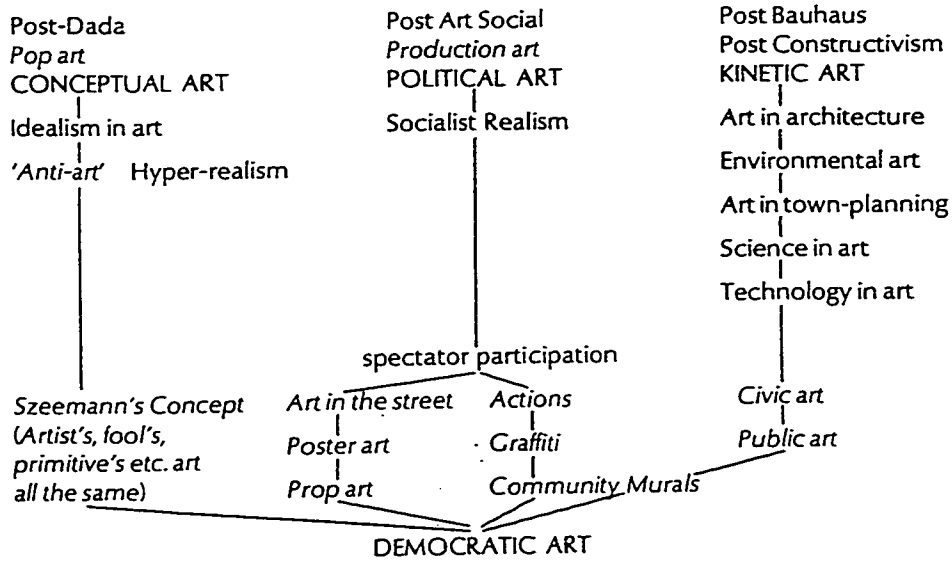
[17] Guy Robert, Art et *non-finito* - Esthétique et Dynamogénie du *non-finito* (Montréal: Éditions France-Amérique, 1984), 33. Guy Robert explains that all works of art have a mystery or "aura". When the artist tries to approach perfection (by trying to achieve their ideas) in their work, the "rainbow" may disappear in front of them; it may be better to leave a work unfinished (*non-finito*) instead of failing to achieve that which is unachievable.

[18] Garvey, Thoughts on Interactivity, [1].

with an art object was permitted. Often, art has been deemed almost "sacred" through its distant placement behind glass or through its limited access. In museums today, electronic security systems and guards ensure that viewers do not come too close to works or art. The necessity for the preservation of fragile media renders such conventions of art admiration understandable, but the difference in the status of a work of art and the art viewer is grounded in more than the exigencies of materials.

## Historical Precedents

Over the last one hundred years, one can observe that many art movements have contributed to the emergence of interactivity in art. In Art - Action and Participation, Frank Popper presents an argument that ties together many of the contributing factors which enhanced viewer participation in art prior to 1975. He concludes with a summary chart that merges various movements--particularly Conceptual, Political and Kinetic art--into what he calls a 'Democratic art':[19]




[19] Frank Popper, Art - Action and Participation (New York: New York University Press, 1975).

But interactive artist Lynn Hershman argues in her article, "Touch Sensitivity and Other Forms of Subversion: Interactive Artwork," that the notion of interactivity in art is particularly endebted to such early twentieth century art movements as Cubism, Dadaism and Surrealism:

> New technologies and their interactive uses by artists now extend many previously conceived ideas such as the use of multiple perspective and simultaneous viewpoints as explored by the Cubists; incorporation of randomness [Duchamp] everyday experience and the audience as investigated by the Surrealists; and the destruction of form as explored by the Dadaists. The conceptual basis for the new reality of art technologies is firmly rooted in art history.[20]

At the turn of the century, the practice of mentally engaging the viewer with artwork was still very much in force. However, it can be argued that the advent of Cubism was particularly critical for the eventual emergence of interactivity in art because it insinuated the compression of "time", an element considered important to the historical development of including the viewer in the "time-dependent dimension" of interactive works.[21] This argument can be applied to Cubist works such as George Braque's Violin and Palette (1909-10) which attempts to show viewers several viewpoints at once (see illustration 6).[22]

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[20] Lynn Hershman, "Touch-Sensitivity and Other Forms of Subversion: Interactive Artwork," Leonardo 26, no. 5 (1993): 431-2.

[21] The element of movement and the passage of time is important in the study of the development of interaction in art because in interactive art, the participant's movements become a part of the work and the experience of the piece is in real time as opposed to viewing a previously created or documentary work (as in pre-recorded video art or film).

[22] One can also argue that the Impressionist movement of the late nineteenth century was an antecedent to interaction since it included the representation of time through the use of "blurry" or "generalized" images. One can also make an argument for the references to time in Medieval paintings or Egyptian hieroglyphics. It is therefore acknowledged that the point of departure may be arbitrary for an argument about the compression of "time".

The ability of some Cubist works to represent brief passages of time was magnified in various Futurist works, where time durations were intentionally depicted. Two examples are Giacomo Balla's Flight of the Swifts (1913) and Dynamism of a Dog on a Leash (Leash in Motion) (1912) (see illustrations 7 and 8). This interest was a dramatic "progression" from and rejection of Cubism, as indicated by Umbro Appollonio in his introduction to Futurist Manifestos:

> The Futurists, like the Cubists, were influenced by stereometry; the Cubists, however (at least in the beginning), took advantage of polyocular vision, so that the object is in a static situation, involved in relations with other objects and the environment, whereas the Futurists, for the most part, superimposed one object on another, or the environment on the object, breaking it up into a dynamic state which is the reflection of the surrounding environment. ... The Futurists, on the other hand, used several axes which cross each other and introduce a combinatory play of multiple intersections.[23]

This early Futurist approach--defined as a "combinatory play of multiple intersections"--has been literally utilized by contemporary electronic interactive artists by their empowerment of the viewer to create several narratives and/or outcomes within their work. Appollonio, perhaps inadvertently, relates Futurism to interactive art by adding that its principles "led to related experiments ranging from the descriptive exaltation of movement to kinetic art, from a representational rationalism with multiple perspective to programmed art."[24]

In addition to the directives outlined in their Manifesto of Futurism, published in Le Figaro

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[23] Umbro Appollonio, Futurist Manifestos (New York: The Viking Press, 1973), 12-13.

[24] Appollonio, 13.

(Paris) on February 1909,[25] Futurism also contributed to the potential for the development of interactive art by emphasizing the importance of the spectator. Umberto Boccioni explained in the 1914 Pittura scultura futuriste that by denying traditional methods of linear-based perspective, "we shall put the spectator in the centre of the picture" and that "the boundaries of the object tend to retreat towards a periphery (the environment) of which we [viewers] are the centre."[26]

One work that has been labelled both Futurist and Cubist through its depiction of movement and use of geometric planes is Marcel Duchamp's Nude Descending a Staircase (1912) (see illustration 9).[27] But Duchamp surpassed the boundaries of the artistic movements of the day by introducing factors that would come to figure prominently in such subsequent art movements as Conceptual Art, Minimalism and Op Art. Duchamp's avant-garde artistic philosophies can also be credited with providing major ingredients that encouraged the emergence of interactivity in art in the latter half of the twentieth century.

Duchamp was a promoter of the utilization of technologies within his artwork--as exemplified

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[25] Futurists sought to capture energy in their art; this motivation arose from their fascination with science, technological progress, flash photography, cinema, industry and the machine. They affirmed the beauty of speed, the glorification of war, a dramatic break from all things connected to the past and a steady look to the future, and a scorn for women and feminism. Most significantly they intended "to exalt aggressive action, a feverish insomnia, the racer's stride, the mortal leap, the punch and the slap." (Appollonio, 21.) See also Christiana J. Taylor, Futurism: Politics, Painting and Performance (Michigan: Umi Research Press, 1979), 4-6 and 17.

[26] Appollonio, 176-77.

[27] Duchamp once stated that depicting movement was one of his motives. He said, "In the Nude Descending a Staircase, I wanted to create a static image of movement." (Pierre Cabanne, Dialogues with Marcel Duchamp, trans. Ron Padget [London: Thames and Hudson, 1971], 30.)

by one of his Rotative Plaques (1920) (see illustration 10)–which soon after became a chief focus of Kinetic artists such as Alexander Calder.[28] Calder used motors and electronic parts in many of his kinetic works such as: A Universe (1934), The Motorized Mobile That Duchamp Liked (1932) and Universe (1974) (see illustrations 11 to 13). Aroused by the Futurists' interest in motion and technological progress, Calder created mobiles that would continuously rotate in order to provide the viewer with new perceptions, contrasting his work to traditionally static paintings and sculptures. It is a valid hypothesis to assume then, that interactive artworks have evolved from this motivation to present the viewer numerous, even unpredictable, consecutive images through electro-mechanical means.

Marcel Duchamp was also one of the earliest artists to incorporate intentional randomness and unpredictability into the formal composition of his work. In Three Standard Stoppages (1913-14) (see illustration 14), Duchamp dropped three separate pieces of string, each one metre in length, onto panels. He then used the unpredictable lines that the strings created as the models for three cut-outs. For The Large Glass (1915-23) (see illustration 15), Duchamp fired a toy gun from across the room at The Large Glass and drilled holes where the pellets hit the glass (the upper right hand corner). Yet Duchamp's appreciation of the unpredictable and random nature of occurrences can be most easily understood with an incident involving the relocation of The Large Glass. When Duchamp heard that the glass panels of this work had suffered numerous fractures during transportation, he decided that these fractures should remain as part of the work.

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[28] It is noteworthy that Duchamp suggested the term "mobile" to Calder in 1932. See Alexander Calder, Calder: An Autobiography With Pictures (New York: Pantheon Books, 1966), 127, and Albert E. Elsen, Alexander Calder - A Retrospective Exhibition (Chicago: Museum of Contemporary Art, 1974), 3.

Unpredictability and randomness have been incorporated in varying degrees by interactive artists of the past two to three decades, with the most commonly used randomizing factor being the personality differences between viewers. For example, in interactive computer works by Benjamin Jay Britton and Toni Dove, viewers chose from multiple choice options posed by the interactive works. Dove claimed that in her virtual reality work Archaeology of a Mother Tongue (1993), the insertion of random parameters into the program enabled her to produce the unpredictability she wanted in her interactive performance (see illustration 16).[29] Benjamin Jay Britton, creator of the interactive piece Je Suis (un readymade) (1991/92) gave his video installation a degree of unpredictability through what he terms a "random number function" (see illustration 17).[30] Lynn Hershman has also created work around the notion of the unpredictable unfolding narrative. One example is Desire Inc. (1989) (see illustration 18); by making contact with a touch screen television, viewers' choices direct the piece to unfold into various narratives. Lastly, Duchamp's use of randomness and unpredictability has been utilized by the Toronto interactive artist Nancy Paterson. In regard to her 1993 work The Machine in the Garden (see illustration 19), Paterson stated that this work arose out of an interest in disorder and randomness achievable through computer programming.[31]

Duchamp was also instrumental in challenging the traditional "Do Not Touch" paradigm

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[29] Toni Dove, "Theater Without Actors - Immersion and Response in Installation," Leonardo 27, no. 4 (1994): 281.

[30] Sara Diamond, Angles of Incidence: Video Reflections of Multi-Media Works (Banff: The International Council for Computer Communication and the Banff Centre for the Arts, 1993), videocassette. Segment "Je Suis (une readymade) - Benjamin Jay Britton."

[31] Nancy Paterson, Machines in the Garden, distributed by Nancy Paterson, 1995, videocassette.

between the art object and art viewer. In 1913, he created a sculptural work in which there was an "implied touching" of the art object by the viewer. Although the work Bicycle Wheel is not presently exhibited in museums in a way that encourages touching by the viewers, in its early days, Duchamp would often set the wheel into motion so that he could be mesmerized as though he were seated before a fireplace (see illustration 20).[32] Although this work was not exhibited publicly for many years, it signifies a shift towards a relationship of physical contact between viewer and artwork.[33]

Duchamp's 1941 work Valise explores the element of touching further. This work is a conglomerate of miniatures of Duchamp's earlier artworks (see illustration 21). By placing these miniatures into a suitcase format that must be physically unfolded and manipulated, Duchamp dictated the requirement of numerous, active physical contacts by the viewer in order to experience the piece. In this way, he once again inserted the requirement for viewer physical activity that is still implied when the work is behind glass. This element of *touching the art* was fundamental for the acceptance of works such as Yaacov Agam's Metamorphosis in 1957, Robert Morris' I-Box in 1963, Norman White's Helpless Robot (1989-1993), and Lynn Hershman and Sara Robert's Deep Contact (1986-1989) (see illustrations 22, 23, 24 and 25 respectively), where physical contact is requisite for the presentation of the work. When basic physical contact with an artwork was first expressed in a unidimensional manner as in the cases of the Bicycle Wheel and Valise, this type of interaction gave rise to what can

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[32] Anne d'Harnoncourt and Kynaston McShine, Marcel Duchamp (Philadelphia: Museum of Modern Art, 1989), 270.

[33] It might be proposed that the two works previosuly mentionned that use bicycles--Jeffrey Shaw's Legible City and Nancy Paterson's Bicycle TV–refer to Duchamp's Bicycle Wheel, although neither artist has indicated that this particular work was the source of their inspiration.

be termed "Simple Interaction".

One of the most interesting implications of Duchamp's artistic philosophies for the development of interactive art arose from his repeated assertion that "it is the spectator who makes the pictures."[34] As we have seen, in contemporary times, this conviction is literally expressed in interactive artworks where viewers directly affect the formal structure of the work.

Through Readymades like the Bicycle Wheel, Duchamp challenged the notion of "the sacred art object" and undermined the mysterious aura of "the original"--elucidated so aptly by Walter Benjamin in "The Work of Art in the Age of Mechanical Reproduction".[35] Most of his Readymades consisted of mass produced materials that formed an-aesthetic[36] objects like a comb, hat-rack and toilet in Comb (1916), Hat-Rack (1917) and Fountain (1917) respectively.[37] Works that provided little visual reward were the result of Duchamp's aversion to "retinal art". In exchange, he offered viewers objects that tested their capacity for conjecture. For example, in the work In Advance of the Broken Arm (1915) (see illustration 26), viewers are challenged to generate ideas that relate the title of the work to the presence

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[34] Yves Arman, Marcel Duchamp Plays and Wins (Paris: Marval, 1984): 119.

[35] Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," Illuminations (New York: Schocken Books, 1969).

[36] The word "an-aesthetic" is meant to suggest something other than an *anti-* or *non-aesthetic*; it is meant to describe an object that has an indifference to aesthetics, or, as Yves Arman writes about Duchamp's Readymades, "all traces of [a]estheticism will be banned." (Arman, 28.) It also is meant to allude to Duchamp's self-label as an "an-artist."

[37] Years later, several Readymades like the Bicycle Wheel were cloned for permanent exhibition in international museums and galleries because most of the original Readymades were lost.

of an industrially-produced snow shovel. In this fashion, Duchamp contributed to ideas developed in the Conceptual movement of the 1960s and early 1970s which was later to influence interactive artists.

By reducing the emphasis on "aesthetic style" and increasing the importance of "ideas", Conceptual artists prompted viewers to interpret art as a mental exercise. This is evident in such conceptual works as: One and Three Chairs (1965) and Art as Idea as Idea (1967) by Joseph Kosuth, Six Thousand Two Hundred and Fifty-Five Lines (1970) by Sol Lewitt, and A Wall Stained with Water (1969) by Bernar Venet (see illustrations 27 and 28).[38] Unfortunately, Conceptual artists could not deny the importance of media to relay messages; vehicles are necessary for the transmittance of concepts. As Ursula Meyer explains, "Kosuth stresses the idea that the morphology of the art-object, in terms of material and style, vitiates the purity of idea. It could be argued, however, that the many objects in Information Room [a Conceptual art exhibition in New York, in 1970][39] are contradicting Kosuth's dictum of *art as idea as idea*."[40] The conceptual movement was thwarted by this internal contradiction, yet the importance of the "immaterial" composition of Conceptual artworks contributed to the interactive work of the 1980s and 1990s by paving the way for an art that did not focus on aesthetics, but instead, concentrated on intangible art software. Although the basis of all

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[38] See David Bellman, From Concept to Context (Toronto: Art Gallery of York University, 1989); Frances Colpitt and Phyllis Plous, Knowledge: Aspects of Conceptual Art (Santa Barbara: University Art Museum, 1992); and Ursula Meyer, Conceptual Art (New York: E.P. Dutton and Company, Incorporated, 1972).

[39] The exhibition Ursula Meyer is referring to was called "Conceptual Art and Conceptual Aspects"; it took place at the New York Cultural Center, New York, in 1970. Meyer uses the term "vitiates" to suggest a corruption, a spoiling or an invalidation.

[40] Meyer, xi.

interactive work is the notion of "responsiveness", two works that specifically draw upon Conceptual principles by focusing on the immaterial properties of virtual reality and cyberspace are the Vivid Group's Mandela System (1986) and Galloway and Rabinowitz's Electronic Café (1984) (see illustrations 29 and 30). In these works, "interactors" rely on ethereal methods of communication in order to manipulate illusional objects, or to communicate with electronically produced facsimilies of people.

*Performance*

At the turn of the twentieth century, some European theatrical performers were engaged in challenging the passivity of their viewers. In particular, artists in Paris created theatrical performances that instigated riotous reactions from their audiences. An excellent example of this is recorded by RosaLee Goldberg in her book Performance Art - from Futurism to the Present.[41] Goldberg documents performances by Alfred Jarry and Tommaso Marinetti; these artists presented shows such as Ubo Roi (1896) that purposely spurred fighting and havoc in their audiences. Lynn Hershman describes the motives of performance artists; "Avant-garde art, particularly performance art, has historically been hostile toward the notion of audience as a collection of passive viewers. Jarry, Brecht, Artaud and Appolinaire reconfigured environments in order to blur distinctions between stage and audience, art and life."[42] In a brief article attempting to elucidate the origins of interactive art, Regina Cornwell communicates how these performances contributed to the growing tendency for the

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[41] RoseLee Goldberg, Performance Art - From Futurism to the Present (London: Thames and Hudson, 1988), 11-13.

[42] Hershman, "Touch-Sensitivity," 431.

viewer to react beyond the conceptual level:

> The audience was pushed, even taunted into responding to a performance or a series of tableaux, a poetry reading, a manifesto declaimed, aimed at shocking or insulting; success for the artists was measured by the reaction of the audience–shouts, egg throwing, riots, the more the better. The provocation became an expectation for the audience.[43]

Productions that followed encouraged the activity levels of audiences in order to provide behavioural alternatives to viewers aside from mere observation.

In the mid-twentieth century, the effect of these performances became the focus of a New York-based group of artists collaboratively known as Fluxus. They presented an increasing number of performances that incorporated audience participation into the composition of their work, particularly in pieces such as Nam June Paik's Étude for Painoforte (1963) and Yoko Ono's Cut Piece (1964).[44] In 1959, performance artist and Fluxus member, Allan Kaprow claimed that it was time to "increase the 'responsibility' of the observer...[so that] you will become a part of the happenings; you will simultaneously experience them."[45] An example is Kaprow's happening Fight: Four Happenings publicized in October 1963 (see illustration 31). In a mailed advertisement, Kaprow invited readers to contact him if they

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[43] Regina Cornwell, "Interactive Art: Touching the 'Body in the Mind'," Discourse 14, no. 2 (Spring 1992): 203.

[44] Hershman, "Touch-Sensitivity," 431. Fluxus members who focused on events (termed "happenings") that often incorporated audience participation included: Allan Kaprow, George Brecht, Nam June Paik, R. Grooms, R. Filliou, Red Grooms, Yoko Ono, Claes Oldenburg, Yves Klein, Christo, Arman, A. Hansen, R. Whitman, Jim Dine, Joseph Beuys, Alison Knowles, Charlotte Moorman and George F. Maciunas. See Happening & Fluxus: Materialien (Stuttgart: Inischer Kunstverein, 1970), and George F. Maciunas, Diagram of Historical Development of Fluxus and Other Four Dimensional Aural, Optic, Olfactory, Epithelial and Tactile Art Forms (Åhus, Sweden: Kalejdoskop, 1979).

[45] Cornwell, "Interactive Art," 204.

wished to participate in the event, thereby including the audience in the composition. At the end of the invitation, Kaprow stated that the performance would have no "spectators" because all of the spectators would be transformed into participants.[46] Similarly, Fluxus member Wolf Vostell's happening You (1964) required viewers to participate in his performance. An advertisement for You stated that "Immediately after the action-lecture the audience will leave by bus for Long Island to participate in Wolf Vostell's happening 'You' a Décollage Happening" (see illustration 32).[47] Another advertisement titled New Happenings at the Reuben Gallery (New York) forewarned gallery patrons that they were invited to become participants in the happenings that would be held in the 1960-61 year (see illustration 33).[48]

As defined by Fluxus member Al Hansen, a "happening involves the overlap and interpenetration of art forms... the observer may take part ...[and] everyone involved must be prepared to live, die, go to jail or be laughed at."[49] This approach indicates the degree to which Hansen perceived a risk component associated with the increased action and responsibility of viewers. But more importantly, Hansen explains that unpredictability was

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[46] Happening & Fluxus, non-paginated.

[47] Happening & Fluxus, non-paginated.

[48] Fluxus member Yoko Ono also believed strongly in including viewer activity in her work. Existing in many forms since 1961, her work Painting to Hammer a Nail asked that participants break with traditional gallery behaviours and use a wood-handled iron to hammer in nails and thereby manufacture a work of art in the gallery. For further investigation into the utilization of viewer activity in Fluxus performances, see Ken Friedman, Events (New York: Jaap Rietman, Incorporated), 1985.

[49] Al Hansen claimed on Wednesday, November 29, 1961, that "if Allan Kaprow is the father of happenings, John Cage is the grandfather." (Happenings & Fluxus - Materialien, section by Al Hansen titled "New Trends in Art" previously published in The Prattler, New York, 29 November 1961.)

a very important ingredient within the composition of a happening, "Consider an event or theatre situation which incorporates film, live dance and acting, music, sounds not considered music, and arranges for these to *Happen* in such a way that it is hard to predict what will *Happen*."[50] It is this desire for unpredictability that recalls the importance of Duchamp for this trend in audience participation. Eventually, the merging of the elements of unpredictability and audience participation would result in, as Hershman contends, "artists such as Chris Burden, Karen Finley and Peter Campus [who] involved live audiences in vivid horror of participatory encounters."[51]

*Intellectual Theory*

Other intellectuals, more academically bound, were concurrently forming new perspectives on how humans acquire knowledge. I find it highly probable that the development of their ideas contributed to the evolving interrelationship between art object and viewer, and consequently present an argument that relates the work of some twentieth century theorists to the domain of interactivity in art.

In the 1920s, the German philospher Edmund Husserl developed his philosophy of transcendental phenomenology, to be first published in The Crisis of European Sciences (1935). Husserl's position was that each individual's subjectivity consititutes his or her world, and therefore, one can never be certain of the independent existence of things; one can only attempt to understand how phenomena appear once translated by consciousness (regardless

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[50] Happenings & Fluxus, non-paginated. See the page marked "New Trends in Art."

[51] Hershman, "Touch-Sensitivity," 431.

of the question of essence authenticity by objects).[52] Also significant are his opinions on "intentionality", whereby he asserts that our conscious minds actively collect and assemble information about the world, thereby "intending" it:

> The genuine intentional synthesis is discovered in the synthesis of several acts into one act, such that, in a unique manner of binding one meaning to another, there emerges not merely a whole, an amalgam whose parts are meanings, but rather a single meaning in which these meanings themselves are contained, but in a meaningful way.[53]

It can be speculated that this type of philosphical view has since filtered into artists' work by encouraging them to create art that relies on the powers of human consciousness to actively 'intend' or mentally assemble the work; the process of experiencing much interactive art relies upon human consciousness by necessitating the viewer's ability to unite disparate elements within unpredictable and non-linear narratives, a cognitive procedure which is based literally on the 'intentions' of the conscious mind. Montreal artist Henry See--creator of the interactive work A Memory Project (see illustration 69)--affirms this assumption when he states that "It is already possible to read a book 'interactively' by getting into a dialogue with the author, skipping back and forth between sections of the books as you follow arguments

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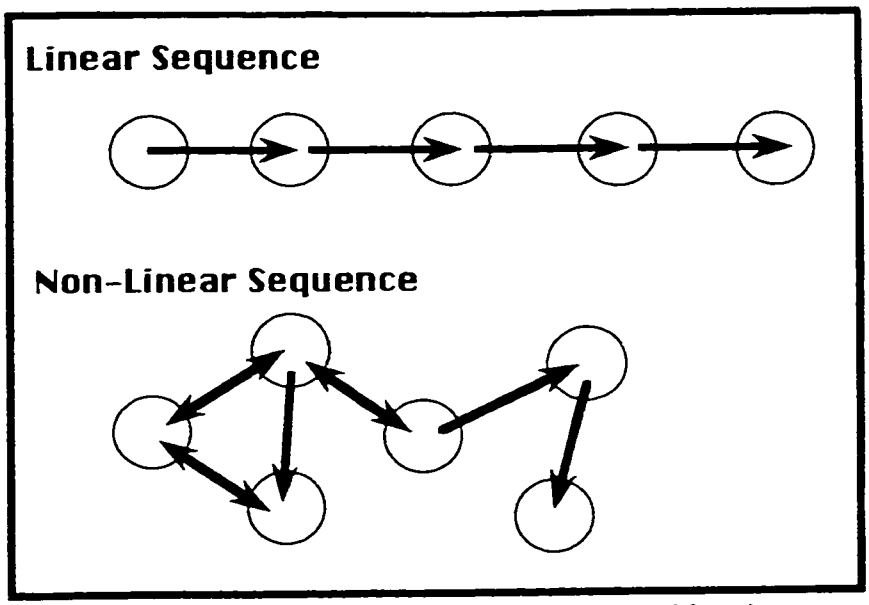
[52] Edmund Husserl, The Crisis of European Sciences and Transcendental Phenomenology (Evanston: Northwestern University Press, 1970), 184-187. Husserl states, "I am the one who performs the epoché, and, even if there are others, and even if they practice the epoché in direct community with me, [they and] all other human beings with their entire act-life are included, for me, within my epoché, in the world phenomenon which, in my epoché, is exculsively mine. ... Thus the immediate 'I' performs an accomplishment through which it constitutes a variational mode of itself as existing... ." (Husserl, 184-185.)

[53] Husserl, 234. For an introductory text, see Terry Eagleton, Literary Theory - An Introduction (Minneapolis: University of Minnesota Press, 1983). Eagleton interprets Husserl by stating, "consciousness is not just a passive registration of the world, but actively constitutes or 'intends' it." (Eagleton, 55.)

and try to let the contents of the book *inform* you."[54]




Unlike viewing a film or reading most books, moving through non-linear information allows the "reader" a choice of sequence and direction.

*From: Brian Slawson, "The Gestalt of a Gigabyte," Art Education (November1993): 21.*

In the book Validity in Interpretation (1967), Husserl's "follower", the American hermeneuticist E.D. Hirsch Jr., argued that although the meanings *willed* by authors are fixed in time,[55] there may be many interpretations of them.[56] It is perspectives like these that

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[54] Henry See, Montreal, to author, Montreal, 7 August 1995, electronic mail [print out] held by author.

[55] Eagleton, 67.

[56] E.D. Hirsh Jr., Validity in Interpretation (New Haven: Yale University Press, 1967). Hirsh Jr. states, "...textual meaning changes from era to era; according to the psychologistic view, it changes from reading to reading." He continues, "Authors, who like everyone else change their attitudes, feelings, opinions, and value criteria in the course of time, will obviously in the course of time tend to view their own work in different contexts. Clearly what changes for them is not the meaning of the work, but rather their relationship to that meaning." (Hirsh Jr., 6 and 8.)

may have influenced artists developing interactive systems, since the meaning of interactive works, although fixed by the limits of the software, lie within the user to "will" it, not merely through interpretation but through a collaboration with the artist. Hirsh's recognition of various interpretations of a work of art also becomes a literal component of interactive work since hundreds of different narratives may be created by viewers.

However the most intriguing connection between literary theory and the evolution of interaction in art involves 'reception theory', developed by the German Wolfgang Iser in The Act of Reading - A Theory of Aesthetic Response (1978). Although interactive artworks had already been emerging by this time, reception theory emphasized the reader's role in understanding a work, claiming that historically the reader had been devalued. In contrast, reception theory in its initial phases and as it has continued to be elaborated, claims to place the reader in a role of central importance by giving the reader credit for completing the work in his/her head. For Iser, humans are never given all of the necessary information in a text to achieve the actual meaning intended by the author. Instead, the reader must use literary conventions or codes that allow thoughts to be joined, thereby creating a narrative text.[57] He states, "The incompleteness of every manifestation necessitates syntheses, which in turn bring about the transfer of the text to the reader's consciousness. The synthesizing process, however, is not sporadic–it continues throughout every phase of the journey of the

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[57] Wolfgang Iser, The Act of Reading - A Theory of Aesthetic Response (Baltimore: Johns Hopkins University Press, 1978), 107-118. Iser writes, "Reading is not a direct 'internalization', because it is not a one-way process, and our concern will be to find means of describing the reading process as a dynamic *interaction* between text and reader." He continues, "The reader's enjoyment begins when he himself becomes productive, i.e., when the text allows him to bring his own faculties into play." (Iser, 107-108.) See also Eagleton, 74-76.

wandering viewpoint."[58]

In addition, reception theory claims that reading is not a straightforward linear movement, but is a process of combining present ideas with previous ones, of conjecturing and remembering.[59] Iser states:

> ...throughout the reading process there is a continual interplay between modified expectations and transformed memories. ... This is the province of the reader himself, and so here we have the first insight into how the synthesizing activity of the reader enables the text to be translated and transferred to his own mind. ...every moment of reading is a dialectic of protension and retention, conveying a future horizon yet to be occupied, along with a past (and continually fading) horizon already filled;... As there is no definite frame of reference to regulate this process, successful communication must ultimately depend on the reader's creative activity.[60]

Nowhere is this more true than in the interactive artwork of artists like Lynn Hershman, Sara Roberts, and Luc Courchesne, whereby non-linear readings are literally integral to the composition of the work. For example, in Deep Contact, the meaning of the work takes new paths depending on the mental connections formed between unpredictable video squences (see illustration 25). Hershman comments on the relationship between interactive media and the demand for the viewer to link indefinite ideas, "Computers, interactive discs, post-symbolic communication, virtual reality and interactive television are but a few of the new information processes that defy linear structure. They require decisions from a participant

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[58] Iser, 109.

[59] When describing the process of connecting unwritten codes and ideas within a text, Iser states, "This mode of grasping an object is unique to literature." (Iser, 109.) Arguably, Iser was not fully aware of the emerging multi-faceted, non-linear interpretation potential of multi-media computer systems. See also Eagleton, 77.

[60] Iser, 111-112.

and incorporate chance into their structures."[61] Illustration 25"f" reveals the complexity of non-linear compositions which are made available to viewers for mental assimilation.

Luc Courshesne's works Portrait One (1990) and Family Portrait, Encounter of a Virtual Society (1993) (see illustration 34) are other examples where non-linear readings are woven into comprehension by the viewer. In both works, the viewer approaches one or four video stations and pushes buttons to investigate conversations with virtual people on video monitors. The meanings of these works take new paths depending on the unpredictable dialogue that unfolds between the virtual people and the viewer. It is this approach to the creation of art that Iser's stand–which places the reader in the role of "copartner"–is expressed.[62]

*Technological Developments*

Concurrent to the activities of various twentieth century artists and theorists were the technical developments of various electronic media. Electronic interactivity is not a new phenomenon; it can be extended back to inventions like the telephone in 1876. However, it was a long time before the telephone, or other communication "tools", would be viewed as a potential medium for art. It is likely that technologies such as the telephone were not immediately utilized as artistic media because they were perceived as being composed of an-aesthetic materials.[63] In addition, unlike television and computers, the interactive potential

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[61] Hershman, "Touch-Sensitivity," 431.

[62] Eagleton, 81.

[63] See footnote number 36 for explanation of the term "an-aesthetic".

of telephonic systems could not be realised visually. Hence, the utilization of the telephone in artistic practices that emphasized "the image" was hindered.

It took several decades before the mental barriers surrounding the perception of the telephone as an artistic tool could be altered.[64] These inhibitions were finally overcome by artists who have recently used the interactive capacity of the telephone for artistic ends. For example, one can recall the telephonic nature of the satellite technologies used in Kit Galloway and Sherrie Rabinowitz's interactive works Satellite Arts Project: A Space With No Boundaries (1977), Hole in Space: A Public Communication Sculpture (1980) and Electronic Café (1984) (see illustrations 35, 36 and 30 respectively).[65] Also, David Rokeby, John Oswald, Don Ritter and Jocelyn Robert formed a collaboration on April 3, 1993 to present a telematic performance as part of the "Le Corps Amplifée" series; this performance connected interactive systems located in Toronto and Quebec City through special telephone lines (see illustration 37).[66] A final example is the interactive work Is Anyone There? (1992-3), by artist Stephen Wilson, which used a network of pay telephones to record participants' conversations.[67]

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[64] The use of the telephone as an artistic tool was realised after "interactive art" had already become a phenomenon. Artists interested in interactive media may have looked at the telephone as an interactive artistic tool in retrospect, as opposed to the use of computers, for example, whose technological developments paralleled its incorporation into art objects and performances.

[65] Steven Durland, "Defining the Image as Place: A Conversation with Kit Galloway, Sherrie Rabinowitz & Gene Youngblood," High Performance 37 (1987): 52-59.

[66] Mary Anne Farah, "Telematic Performance Loops Toronto and Quebec," Fuse 17, no. 1 (1993): 41-2.

[67] Stephen Wilson, *"Is Anyone There?*: A Voice-Activated Tour of San Francisco Via its Pay Telephones," Leonardo 27, no. 4 (1994): 303. See also Stephen Wilson, "Is Anyone There? A Voice Activated Tour of San Francisco Via its Pay Telephones," in Netscape

But the use of telephonic systems in interactive art seems relatively limited when compared to the dramatic utilization of video and television. In the early decades of the twentieth century, film, video and television presented the next stages in the path towards recording passages of time onto (more or less) permanent media. As Myron Krueger--a pioneer in interactive environments--states, "With the advent of film and kinetic sculpture, the artist could deal with time, motion and narrative, and the viewer could vicariously experience dynamic events. An obvious next step is a medium that invited the audience to participate and actually influence events."[68]

One of the most interesting phases in the development of interactive art occurred when documentary media were being investigated for their interactive potential. Television, for example, was primarily used to present pre-recorded programs, or in later years, to present live broadcasts. Although television is interactive to a certain extent (it can be turned on and off and the volume and colour can be affected), it was generally used as a device to send information in the direction of home viewers only. The 1950s television show Winky Dink and You was a telecast that dared viewers to break this convention by encouraging them to make physical contacts with their sets. This program invited children to draw on the screens of their television sets with special markers and clear plastic overlaying screens in order to complete images described in stories being told (see illustration 38).[69] The act of affecting

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[WWW], 20 May 1995. Available from:<http:\\tmn.com:70\0\artswire\interactive\anyonethere.wilson>

[68] Myron W. Krueger, "Videoplace: A Report from the Artificial Reality Laboratory," Leonardo 18, no. 3 (1985): 150.

[69] Lynn Hershman, "Bodyheat: Interactive Media and Human Response," High Performance 37 (1987): 46. Admittedly, the television program Winky Dink and You can be argued to possess limited interactive qualities because *inactivity* also results in the story's

the images on the television screen prefaced the type of activity that would be encouraged in future interactive artworks such as Je Suis (un readymade) and Deep Contact (see illustrations 17 and 25). This "viewer-active" ingredient was another step in challenging the notion that television was as a one-way information sending device whose image could neither be touched nor manipulated.

In the early 1960s, Marshall McLuhan was postulating and documenting his ideas about technologies, art and the artist, later to be chronicled in the 1964 publication Understanding Media - the Extensions of Man. In this text, McLuhan wrote about an artistic evolution that was attempting to combine the viewer with art, "...the artist [has] turned to presenting the creative process for public participation. He has given us now the means of becoming involved in the making-process."[70] Although he prefaced his argument with the idea that the avant garde artist no longer exists because of advances in instantaneous communications,[71] he recognized an artistic shift towards creating "living" technological models whose acceptance would be strongly resisted by the public. He described techno-artists as knowing that, "...they are engaged in making live models of situations that have not yet matured in the society at large. In their artistic play, they discovered what is actually happening, and thus they appear to be 'ahead of their time.'"[72] McLuhan was inadvertently describing artists in the 1960s who were experimenting with the first elements of electronic interaction between

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continuance.

[70] McLuhan, 174.

[71] McLuhan writes regarding the death of the avant-garde artist, "For in the electric age there is no longer any sense in talking about the artist being ahead of his time." (McLuhan, 70.)

[72] McLuhan, 215.

the art object (or performance) and the art viewer. The work of these artists would not be accepted and identified with the term 'interactive art' until twenty years later; hence these artists were, as McLuhan described, "ahead of their time."

During the early years of the development of computers, a few artists were attempting to recreate images typically realised with conventional media. This was the case on an international level, as artists around the world were pursuing the application of technologies to laborious art practices. One such chronological account is provided by Martin Sperka in the article, "The Origins of Computer Graphics in the Czech and Slovak Republics," however, it should be remembered that in each geographical area, the pace and level of technological sophistication was different.[73] Another such example is provided by the American artist A. Michael Noll who recently published his memoirs. Noll recounts his time as an electronics researcher at Bell Labs when it first occured to him to use computers to make art. He narrates the story that led him to produce an early series of computer-generated artworks Patterns by 7090 (dated 28 August 1962) in the article "The Beginnings of Computer Art in the United States: A Memoir":

> I still can remember the day when a fellow summer intern with whom I shared an office, Elwyn Berlekamp, came down the hallway with a computer-generated plot of data that had gone astray because of some programming error. Lines went every which way all over his plots. We joked about the

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[73] Martin Sperka, "The Origins of Computer Graphics in the Czech and Slovak Republics," Leonardo 27, no. 1 (1994): 45-50. The abstract reads: "The author summarizes important events in the development of computer graphics and its application in fine art and animation in Czechoslovakia up to the year 1989, when the Iron Curtain fell. The general situation and political atmosphere in the country and their influences on contemporary art are also discussed, as are scientific and technological developments in the computer industry, artists using computer graphics, and computer art exhibitions and publications." See also the special issue "Promotheus: Art, Science and Technology in the Former Soviet Union" in Leonardo 27, no. 5 (1994), and aforementionned articles by Krueger and Elkins.

> abstract computer art that he had inadvertently generated. It then occurred to me to use the computer, an IBM 7090, and the Stromberg Carlson plotter to create computer art deliberately. Thus my experiments in computer art began in the summer of 1962 at Bell Labs.[74]

Three works within the Patterns by 7090 series were Gaussian Quadratic (1962), Computer Composition with Lines (1964) and Ninety Parallel Sinusoids with Linearly Increasing Period (early 1960s) (see illustrations 39 to 41). Other aritsts who experimented with computers as an experimental drawing tool were Vichy Chaet and Stephen Wilson. Over the last three decades, they created computer-plotted curves based on mathematical formulae which emulate Optical Art works through their use of coinciding lines (see illustrations 42 and 43).

However, it was only when computers were being used to create artforms not easily attainable through other means that they became a significant medium within the history of art. At this time, some artists using traditional media veered towards the potential of including electronics, and later computers, in their work. Robert Rauschenberg was one of the early artists to explore electronics in an interactive capacity. Prior to this, Rauschenberg created the "participation piece" Black Market (1961) (see illustration 44), a work that permitted gallery visitors to remove and replace objects from a case placed on the floor; viewers were requested to stamp the object and make a drawing of it on a nearby clipboard, thereby creating a record of the relocated objects.[75]

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[74] A. Michael Noll, "The Beginnings of Computer Art in the United States: A Memoir," Leonardo 27, no. 1 (1994): 39.

[75] Writer Lawrence Alloway reported that people took advantage of the contact between art object and viewer through theft, "As Rauschenberg expected, some visitors removed objects without exchanging them for new ones. He learned that the drawings on the clipboards were being removed as well." (Lawrence Alloway, Robert Rauschenberg [Washington: Smitsonian Institution, 1976], 114.) Perhaps a move towards electronic interaction was a way to minimize physical deterioration of some works.

In the following years, Rauschenberg went on to produce electronically interactive works such as Dry Cell (1963), Oracle (1965), Solstice (1968) and Soundings (1968) with a team of electrical engineers and technicians (see illustrations 45 to 48). Although Dry Cell (1963) represented one of the earliest viewer-activated electronic artworks, Rauschenberg's larger scale work--Soundings--received more critical attention. Soundings required that spectators make sounds (by singing, clapping or talking) to illuminate silk-screened images of chairs placed behind 8x36 foot partially-mirrorized panels. Regarding this work, Billy Klüver, co-founder of EAT (Experiments in Art and Technology) with Rauschenberg, said:

> If the perceiver did nothing, only his or her reflection appeared dimly in the darkened room. ... To explore the work, you have to continue talking or singing. If several people are there with you, the situation is one of participation, competitiveness and cooperation as viewers try to extract more and more images from the darkness.[76]

Rauschenberg also acknowledged that his intent was to increase the participation of viewers with his work in order "to make the viewer responsible for the art work that he or she sees. Earlier I was the artist. Now the viewer will make the image, not I."[77]

A review of the literature shows that in the late 1960s and early 1970s there was an increased

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[76] Cornwell, "Interactive Art," 205.

[77] Cornwell, "Interactive Art," 205. It can be argued that the viewer does not make the image in Soundings. The image of the silk-screened chairs was composed by the artist. If illumination is the critical ingredient that makes an image as Rauschenberg states with his phrase "the viewer will make the image," then turning on one's lights at home is also making an image. In addition, Rauschenberg's claim that "Earlier I was the artist..." implies that his self-image as an "artist" may have been altered.

interest in interactivity in many disciplines, not merely the visual arts. The emergence of interactive tools became of increasing interest to artists as they discovered that these media offered an increased efficiency over many laborious art practices *and* also had inherent artistic potential. For example, researchers at the Massachusetts Institute of Technology (MIT) were working on Adventure in the 1970s--a work of computerized interactive fiction that allowed users to make choices that determined the unfolding of a story.[78] Similarly, by 1968 in the field of architecture, computer programs were already being developed that would later evolve into sophisticated designing programs such as "CAD" (computer-aided design).[79]

But specifically, Lynn Hershman believes that three electronic inventions created since 1896--namely, the telephone, the automobile and the computer--have allowed people the facility to compress space and time in ways that have stimulated the interactive potentials presently existing in society.[80] Further inventions such as fax machines, satellites, tele-conferencing technologies and the Internet have reduced the gap between interacting parties geographically. It is not surprising, therefore, that electronic artists, particularly interactive artists, use such a wide range of electronic media to create art. However, Roger Malina writes that early techno-artists who merely used commercially available, pre-fabricated

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[78] Benjamin C. Pierce, ed., "Woggles From Oz: Writing Interactive Fiction," Leonardo 27, no. 4 (1994), 363.

[79] For example, the Canadian architect Douglas Cardinal used CAD technologies during his design of the Canadian Museum of Civilization (1983-1989) in Hull, Quebec. For a text that outlines the use of CAD technologies by architects, see: Mark Lauden Crosley, The Architect's Guide to Computer-Aided Design (New York: John Wiley & Sons, Incorporated, 1988).

[80] Hershman, "Touch-Sensitivity," 431.

technologies may have limited themselves artistically. An argument is made that the only artists who pushed ahead were those who understood the inner-workings of these new inventions, namely such technophiles as programmers:

> Many computer artists not interested in learning to program the computer live within the constraints of software developed for other purposes. ..Many artists creating kinetic artworks and applying new technology to art during the 1960s and 1970s failed to transcend the capabilities of the technology. ..until the artist has access to the technology, its potential for artmaking cannot be fully understood.[81]

One of the artists who went beyond the surface capabilities of emerging technologies was Valie Export. In the years 1969-73, this Viennese performance artist created the interactive work Autohypnose, one of the earliest interactive artworks that used video (see illustration 49). Regina Cornwell describes the work:

> A large diamond shape was stencilled onto a floor mat punctuated with arrows pointing to coded words including "self," "development," "love," "knowledge," "discipline, "mediation," etc. The mat concealed sensors connecting the terms to Export's video program. Visitors picked their own pathways, choosing one or another route through the coded diagram, activating the program. Export's Autohypnose delivered an ironic social comment: at the end of a societally correct path, such as the choice from possession to love to resignation to experience to mediation, the monitor sprung to life with the image of an applauding audience. If one stepped through a path not socially condoned, there was no applause for the performance and the screen announced 'Wrong Way.'[82]

Other interactive works paralleled the emergence of Autohypnose. From 1969 onwards, Canadian reseacher Myron Krueger was working on his interactive environments Metaplay (1970) and Psychic Space (1971). In Metaplay, a video camera recorded images of

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[81] Roger Malina, "Digital Image - Digital Cinema: The Work of Art in the Age of Post-Mechanical Reproduction," Leonardo 23 Supplemental Issue (1990): 34.

[82] Cornwell, "Interactive Art," 207.

participants moving in a defined space. These images were superimposed onto computer graphic images which were then projected in front of the viewer, thereby placing the participants in a computer-generated and manipulatable virtual world. Krueger relays that, "Many interactions evolved in this framework, including one in which the participant appeared to draw on the screen by moving a finger through the air."[83] In Psychic Space, Krueger created a responsive piece similar to Valie Export's Autohypnose due to its use of a sensitive floor grid. In this work, as gallery-goers walked, their movements were translated symbolically onto a large video projection screen ahead. Krueger describes the interactive potential of the system as follows:

> ...the participant's footsteps on the sensing floor controlled the movement of a graphic symbol within a projected graphic maze. If the participant attempted to cross a boundary illegally, the boundary could stretch elastically, the symbol could disintegrate, or the whole maze could move as if the participant's symbol were pushing it. There were approximately 40 different response modes that a participant could discover while moving through the maze.[84]

In 1985, Psychic Space evolved into Videoplace (see illustration 50). Videoplace discarded Psychic Spaces's sensitive flooring system, replacing it with a camera that recorded an outline of the participant's moving image and sent the information to a computer. The computer combined the participant's image with various moving graphic symbols (in one case called a "Critter") and the composite was projected to the video monitor. Consequently, a participant could appear to lift or manoeuvre symbols on the screen without the bulky use of attached electronic devices associated with present day virtual reality systems. Krueger explains, "People don't need goggles and gloves. They adapt quite easily to the idea that the

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[83] Krueger, 147.

[84] Krueger, 147.

image is functioning as an extension of their body."[85]

While Myron Krueger was developing his prototype virtual environments, two American artists, Sherrie Rabinowitz and Kit Galloway, were pioneering the utilization of satellites for artistic performances via electronic interaction. In 1977, they created "the world's first interactive composite-image satellite dance performance" with their piece Satellite Arts Project: A Space With No Boundaries. In this work, dancers separately located in Maryland and California were combined in a virtual space for a unifying performance. Other works such as Hole-in-Space: A Public Communication Sculpture (1980) and Electronic Cafe (1984) also utilized the potential of satellites to compress space between performers and audiences (see illustrations 35, 36 and 30 respectively).[86]

The works mentioned above were some of the pioneering attempts at establishing new roles for the art object (or performance) and viewer. In most cases, the artists used older equipment for affordability and combined various technologies, as Krueger did, to create their works. Writer Jim Pomeroy explains:

> The most interesting work can be seen in the 'back-room' Art Shows, generated out of slightly older systems from accessible media labs, university research associates, and the laborious result of solitary individuals tweaking hybrid micros and custom designs. The technology may be a little outdated, but it is personal, understandable, and affordable.[87]

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[85] Chris Dafoe, "Artists Key Players in Virtual Reality," The Globe and Mail 12 July 1993, C1.

[86] Durland, 54, 56, 58.

[87] Jim Pomery continues, "Unlike salon-oriented, well-bred fine art, contemporary techno-art usually has the look of the makeshift prototype, self consciously 'machined' and resembling something like studio furniture, laboratory apparatus... than framed, polished Fine

Two solitary artists whose early work possessed this "back-room" quality were Norman White and Ian Carr-Harris. After becoming a Canadian citizen in 1974, White emerged as one of the progenitors of interactive art in Canada. Many of his initial projects had a "gadgety" appearance. Works like State of the Art (1974)--then referred to as "participatory"[88]--appear to have been assembled from disparate parts. The plexi-glass outer shell houses circuit panels and visible wires that contribute to an "electronic laboratory" aesthetic. Its title intentionally draws attention to the "assumed" ability of technological materials to increase the quality of human life. Another piece, Gestalte Fish (1974), has a similar aesthetic and message. Exposed wires and switches, combined with lights and electronic detectors contribute to this effect (see illustrations 51 and 52). Similarly, Ian Carr-Harris's works On Stage and In German operated with minimal interactive effort. On Stage (1970) required a person to stand on a small stage; doing so would trigger a flooding of light upon them. In German (1982) required participants to push a button that triggered the illumination of a loudspeaker; sounds coming from the speaker were of a man singing to himself and clearing his throat (see illustrations 53 and 54).[89]

An Increased Production of Interactive Art in the 1980s

It has been established that the impulses behind interactive art can be traced through various artistic trends, philosophies and technological developments during the twentieth century.

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Art elegance." (Pomeroy, 276 and 278.)

[88] Norman White, Norman White (Vancouver: Vancouver Art Gallery, 1975), 22.

[89] Jessica Bradley, Ian Carr-Harris & Liz Magor: Canada's XLI Biennial in Venezia, 1984 (Ottawa: The National Gallery of Canada, 1984), 9.

Yet, it was not until the 1980s that electronic interactive art was produced with sufficient fervour to result in any significant placement of this genre of work in arts institutions. An examination of the literature reveals that the 1980s was a critical period for the development of complex methods of interaction in art. Works like Ed Tannenbaum's SYM-ulations of 1986 represent the beginnings of a complex mode of interaction that would be adopted by other interactive artists in the 1990s.[90] To illustrate, SYM-ulations (1986)--a work that offered viewers four types of symmetrically transformed computer portraits--bears strong resemblence to the 1992 work Telespecchio by Sabine Reiff and Flavia Alman, whereby participants' faces are transformed into caricatures (see illustrations 55 and 56).[91]

The significant escalation in the production of electronic interactive art in the 1980s came about most certainly because of the availability of lower cost, user-friendly computer hardware, software and other technological components. For example, the portable video camera and computer video-editing equipment was introduced to the public in the mid-1970s.[92] A collaborative artistic team consisting of Kristi Allik, Shane Dunne and Robert Mulder (composer, computer scientist and visual artist, respectively), claim that the 1980s surge in interactivity resulted from the increased availability to artists of a specific technology

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[90] Pomeroy, 281-283. Another 1980s' work that has been somewhat imitated in the 1990s is Recollections (1981) by Tannenbaum. In Recollections, viewers created "a multitude of trailing silhouettes, oscillating contours, and reverberant figures of their own bodies, brilliantly cast.... The temptation [was] to paint with one's body." Because of the similarities, Recollections seems likely to have been drawn upon for the production of The New York Hall of Science's Shadow Wall (1993) and Hiroyuki Moriwaki's Rayo=Graphy (1993). See the 1993 and 1994 Images du Futur catalogues.

[91] Telespecchio (1992) was most recently installed at the 1995 "Images du Futur" exhibition in Montreal.

[92] Bill Viola: Unseen Images 19/12/1992 - 28/2/1993 (Dusseldorf: Kunsthalle, 1992) 135.

named MIDI (Musical Instrument Digital Interface): "Until recently, the concept of using computer networks in the studio or in real-time performance was only an engineer's dream. That suddenly changed when MIDI gave thousands of artists a glimpse of the potential of such integrated systems."[93]

Once artists had materials like these available, the number of interactive art works exhibited rose dramatically. As a result, pressure was placed on various art centres to present these works. However, few arts institutions accepted these works immediately. In a 1992 interview, artist David Rokeby stated that when interactive art was just emerging, artist-run centres were willing to show his work while commercial galleries and museums were wary, "They were very open to this kind of work in the early eighties when no-one else was. And now, there's a natural progression. Now it's suddenly acceptable to show this kind of work in large institutions which it hasn't been for a long time."[94]

Grahame Weinbren, American interactive artist and creator of the piece Sonata, a work of interactive cinema, believes that other art insititutions have recently become more accepting

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[93] Kristi Allik, Shane Dunne, and Robert Mulder, "ArcoNet: A Proposal for a Standard Network for Communication and Control in Real-Time Performance," Leonardo 23, no. 1 (1990): 91. Don Ritter describes MIDI: "In the case of the integration of music and computers, one thing that was necessary was to allow my instrument to somehow be controlled by computer. ... Various companies devised different ways of doing it. In 1986, the electronic music industry, dominated basically by Yamaha, Roland, Casio, ...(practically all Japanese companies) agreed on a language that... transmits information that is appropriate for describing music, ... In computer terms, its what is called a protocol. It's a method of communication between anything that speaks MIDI basically. I can have one electronic music instrument speak to another electronic music instrument, which speaks to a computer [so that] with one computer, I can control sixteen instruments at the same time." (Ritter, interview.)

[94] David Rokeby, interview by author, 7 November 1992, Toronto, tape recording held by author.

of interactive work. He contends that most commercial galleries prefer to exhibit product-oriented artworks like paintings and sculptures over time-dependent electronic pieces.[95] However, some commercial gallery owners are slowly starting to understand the historical significance of interactive art. For example, Ydessa Hendeles of the Ydessa Hendeles Foundation in Toronto, exhibited Gary Hill's interactive piece Tall Ships in 1993 (see illustration 57), and Janine Cirincione, one partner of The Jack Tilton Gallery in New York's Soho District, showed interactive and virtual reality art in a 1992 exhibition, claiming it to be "the most popular show we had."[96] American interactive artist Eric Ross emphasizes that, "They must understand that this is fine art that is collectible and historically very important. ... We need to see more of the larger museums getting involved and doing retrospectives."[97]

Indicating the increased trend towards the production of electronically interactive art, was the increased number of interactive artworks installed at computer art exhibitions. SIGGRAPH, an annual and international exhibition of computer art, has been including an increasing number of interactive artworks amongst other two-dimensional, computer-generated works over the last decade. In addition, a review of art-related periodicals reveals that in the mid-1980s, there was a marked increase in the amount of coverage devoted to

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[95] Jean Marie Angelo, "Interactive Art - Slowly Emerging; Profits Remain a Question Mark," Computer Pictures (January/February 1994): 27. Perhaps the reason that interactive art has continued to meet with resistance in commercial galleries is because it is not easy to apply financial value to a genre of work where no traditionally-structured art market exists. Weinbren relays, "I've never had a show in a commercial gallery. ...There doesn't seem to be a market. With art, the idea is to invest in something that appreciates in value. This work changes depending on what you do with it. Therefore, you can't pin a value on it." It is also probable that the marketing difficulties of interactive art arise from the inclusion of the viewer in the work.

[96] Angelo, 27.

[97] Angelo, 27.

interactive art in some contemporary art magazines.[98]

Contributing to the increasing critical coverage on the topic, the number of events devoted entirely to the promotion of interactive art has risen. For example, the biannually-produced VideoWochen, a week-long festival in Basel, Switzerland, initiated in 1984 by René Pulfer, is held to "propel the interactive aspect of experimental video production back into center forum."[99] This event was designed to bring together interactive artists and curators, led by internationally renowned artists such as Dara Birnbaum, and to promote discussion in the area of interactive video art.

In Canada, the number of interactive art exhibitions also appears to have increased from the mid 1980s on. For example, from June-July, 1987, A Space (an artist-run centre in Toronto) organized the previously mentioned exhibition titled "Interactive Artworks" which included several computer-controlled interactive pieces. Curated by interactive artist Nancy Paterson, the exhibition featured such works as David Rokeby's Echoing Narcissus, Money by Bob James (alias D. Nile), and Lynn Hershman's Lorna (see illustrations 58 and 59).[100]

One year earlier in Montreal (1986), an annually-produced exhibition called Images du Futur

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[98] To illustrate, eight interactive art works were included in the SIGGRAPH 1988 exhibition of computer art, and two years later, writer Jane Veeder reviewed them in an article for Leonardo titled, "Viewer into Player: Notes on the Interactive Computer Art Installations at the 1988 SIGGRAPH Exhibition of Computer Art." See Leonardo 23, no. 1 (1990): 136-138. Trying to find reference material that reviews so many interactive artworks prior to the mid-1980s is a difficult task.

[99] Ken Gill, "VideoWochen," High Performance 37 (1987): 43.

[100] Lisa Rochon, "High-Tech Works Take Their Cue from Computers," The Globe and Mail, 25 June 1987.

was founded by Ginette Major and Hervé Fischer. The goal of the exhibition was to promote public awareness of technology, science and art. Major stated in a recent interview:

> I wanted the general public to be aware that we are going into a new culture now called 'technoculture.' Many people don't know that we can do something else with the computer other than just add up your bills. You can make images now with computers... We are going into a new age, a new culture, and this new culture can also be seen in the art field. ...We came up with the idea of making each year a large and international exhibition for the general public that would show all kinds of applications of technologies and visual arts and communications, and arts in general.[101]

Over the last ten years, interactive works have been a substantial part of the Images du Futur exhibition. For example, in their 1993 show, thirteen of thirty-nine works in the show were interactive including the following American-produced works: Timothy Binkley's Watch Yourself (1991), Ken Butler's Test Site (1993) and Perry Hoberman's Faraday's Garden (1993) (see illustration 60). In addition, three Canadian contributions were included: Danielle Joliffe's Untitled Ball (1992), Don Ritter's Fit (1993) and the Mandela System VR (1986) by Vincent John Vincent's Vivid Group (see illustrations 61 and 29 respectively). The following year, ten internationally-produced interactive pieces were included in which Canada's Greg Garvey contributed The Automatic Confession Machine: a Catholic Teering Test (1993) (see illustration 62).

More recently, a Toronto exhibition surfaced in 1994/5 that contained a high percentage of interactive works. Titled *TechnoArt*, the exhibition was held at the Ontario Science Centre in Don Mills, Ontario from November 1994 to January 1995. Curated by Derrick de Kerckhove, the Director of the McLuhan Program for Culture and Technology at the

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[101] Ginette Major, interview by author, 24 September 1993, Montreal, tape recording held by author.

University of Toronto, the exhibition featured, among others, such interactive works as Norman White's Helpless Robot, David Rokeby's Very Nervous System, Nancy Paterson's Bicycle TV (see illustrations 24, 63 and 64), Peter Grucza's Garden in the Machine and Hinoyuki Moriwaki Yokahama's Rayo-Graphy. The exhibition was well received by the public perhaps due to the environment within which it was placed, namely the Science Centre, which is in contrast to any typical gallery setting. Attendants are reported to have praised the interactive pieces, saying, "I particularly liked the interactive element of it," and "I'm impressed there's a lot of interactive pieces. I love the way everything changes and the movement."[102]

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This chapter has traced the various threads that were pulled together, consciously or unconsciously, into what became, in the mid-1980s, a substantial exploration of the possibilities of interactivity in electronic art. Chapter 2 will outline some of the motivations that artists indicate lie behind the creation of interactive art. Subsequently, it will provide a brief discussion of the audience's reaction to "interactivity" and some problems which this relatively recent art phenomenon has encountered.

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[102] Sonya Procenko, "Cutting-edge Technology Makes Unique Art - Techno-Art Urges Visitors to Interact with Artists' Works," The Toronto Star, 1 December 1994, NY10.

# CHAPTER 2

# ARTISTS' MOTIVATIONS AND VIEWERS' RESPONSES

## PART I - ARTISTS' MOTIVATIONS

When artists were asked why they ventured to use the interactive capacity of electronics for their artwork, they responded with a multitude of justifications. Interestingly, all of their responses indicate a desire to challenge, in one way or another, the traditionally-based dynamic between the art object and viewer. The following is an account of their testimonies.

### Breaking the Tradition of Passivity

In texts by some interactive artists, one can see the persistent theme of the desire to challenge the spectator's role during the "art experience". These artists are of the view that passive viewer behaviours in the gallery setting are undesirable. Interactive artist Lynn Hershman explains:

> Traditionally, there has been a presumption that viewing art is passive, and only the making of it is active. New media insists upon the participation of viewers. It is meaningless without it. ...[With interactive media] the controls quite literally are now in the hands of users, as is the key to a new era of individual freedom and empowerment. Clearly, the reformulation of a fundamental dialogue has begun.[103]

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[103] Hershman, 45.

New York artist Timothy Binkley works in interactive media because of his distaste for the passive role of the art object itself, which he believes encourages passivity in viewers. He writes:

> One of my main interests in creating interactive installations is to play the active involvement of a computer against the passive role assumed by traditional works of art. ... its purpose is rather to invite users to contemplate the radically different cultural possibilities opened up by computerized virtual realities that attenuate and diversify the imposing authority of tradition.[104]

Stephen Wilson is in agreement with Binkley regarding his motivations for creating interactive art. In 1990, he wrote, "We wanted to explore a more vital kind of art that required active audience participation. ... Any work is incomplete without the viewers taking action."[105] Wilson believes that danger lies in continuing to suppress viewer participation:

> We can no longer afford art that sits quietly on walls in special art appreciation places. Acceptance of the role of passive spectator by art audiences takes on new danger in the contemporary era. The combination of the mass media and the centralization possibilities of computerization possess an unprecedented threat to the human spirit. Already a huge portion of the population is having its consciousness shaped in uniform ways by expensive to common media experiences. Diversity of perspective and individual activity and initiative, which historically have some of the key resources of the human community, are currently at risk. ... Art presented in the traditional way to an audience of passive spectators reinforces the dangerous idea that people should accept what is offered.[106]

Wilson has not swayed from this opinion, for five years later, in 1995, he still argues that,

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[104] Ginnette Major and Hervé Fischer, Images du Futur '93 - 14 mai au 19 septembre (Montreal: Cité des Arts et des Nouvelles Technologies, 1993), 14.

[105] Stephen Wilson, "Interactive Art and Cultural Change," Leonardo 23, no. 3 (1990): 259, 262.

[106] Wilson, "Interactive Art and Cultural Change," 261-262. Wilson continues to write, "Ironically, the new media are potentially even more mesmerizing than traditional forms."

"Our culture is in danger of increasing passivity in all realms--politics, art entertainments, ethics. I hoped interactive structures in art could alert audiences to passivity in other realms of their lives. I was interested in empowerment."[107]

Increasing Emotional Integration

In contrast to motivations which focus on breaking with the general tradition of authority, interactive artist Don Ritter seems more interested in heightening the emotions within audience members. Ritter became interested in interactivity when he observed that traditional visual media rarely incite expressions of human emotion. He explains his motivations for creating the interactive system Orpheus by comparing the physical activities of people in art galleries to those experiencing live music:

> These viewers [in art galleries] are like the bereaved at a wake, paying respect to a friend. ... While music performances...provoke audiences to clapping, cheering, dancing and a whole range of physical activities which are strictly verboten in a museum of fine arts, ...try clapping and cheering in front of a favourite painting in a gallery and one's sanity will certainly be questioned while being ushered to the front door by a solemn guard. ...This conclusion has had considerable discomfort to my artistic motivation. To overcome this discomfort, I desired to create a visual medium containing the living qualities found in music and music performances.[108]

Concern for a "living quality" led Ritter to link his "life-less" video images to a "living" component, either improvised music, dance, or a random television program as in the performance Media Play: Given the Television (1990). The result was the creation of a video

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[107] Stephen Wilson, San Francisco, to author, Montreal, 4 August 1995, electronic mail [print out] held by author.

[108] Don Ritter, "Interactive Video as a Way of Life," Musicworks 56 (Fall 1993): 48-54.

art medium that could be performed interactively.

Ritter elaborates by comparing "dead" traditional art forms to more "living" art forms like music, "musical media, such as live music, are primarily concerned with life, while visual media, such as painting, drawing and sculpture, are concerned with that opposite state of being, death."[109] Manufacturing a human-dependent form of video art has caused the elevation of the "dead" medium of video, to the status of "having life", which is echoed in the spirits of viewers.

In agreement, interactive artist David Rokeby believes that, "what often goes into galleries is the dead effluvia of the creative process,"[110] illustrating the perception that many gallery-accepted (non-interactive) art forms such as painting and sculpture are "living" during the creative process, but "die" after completion. As a result, Rokeby's intent is to present an essence of "life" in his work in order to stir emotional responses within viewers:

> ...the success of my [Very Nervous System] as compared to others, is that I have approached things from a non-technical perspective. Even though I've been heavily involved in technological development, the focus has not been so much on high resolution and slick operation as in practical success and provocative response.[111]

Similarly, other artists explore the element of interactivity because of the perception that it

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[109] Don Ritter, "Interactive Video as a Way of Life," Cultural Diversity in the Global Village (Sydney, Australia: Third International Symposium of Electronic Art, 1991), 78.

[110] Patrick Davitt, "Body Language Explores Movement's Relationship to Sound," Regina Leader-Post 23 September 1992.

[111] Don Hardy, "Moving Music," Music Technology (October 1989): 60.

has the potential to heightens viewers' experiences. For example, Greg Garvey creates interactive art because he believes that users' experiences are more profound if they become partly responsible for their encounter, "In my estimation, a crucial part of the satisfying experience is to make aesthetically meaning[ful] choices ostensively at will in collaboration with the domain of possibilities constructed by the artist."[112] Steven Wilson states, "I thought it [interactivity] drew audiences in more. [It] made the art a less superficial experience [since] it required more mind, heart, etc., to make the work function."[113] In agreement, Henry See believes, "where the experience of the art work will vary with the user's interaction with it, the role of the artist is to create a structure which permits variations of experience. Each of these experiences must have a certain sense of closure. They must be satisfying for the user/participant."[114] Similarly, Luc Courchesne asserts that although interactive art inspires viewers to varying degrees, he is particularly interested in the ways that it can transform viewers and the meanings derived from the work, "My works are experiments in interactivity, what it does to content and how it affects the visitor/user/actor."[115]

Emphasizing Process Over Product

Ritter feels that interactivity also allows individuals the opportunity to witness the creative

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[112] Garvey, Thoughts on Interactivity, [2].

[113] Wilson, electronic mail.

[114] See, electronic mail.

[115] Luc Courchesne, Montreal to author, Montreal, 9 August 1995, electronic mail [print out] held by author.

act of art-making, instead of merely watching pre-recorded works:

> The whole purpose of this is to actually watch the creation of a piece. ... When you watch a film, you do not watch the creation of the film. You watch the created film. When you go to any improvised performance, whether that is music or dance, you will be watching the creation of a piece, and that's what I'm trying to create... to allow an audience to watch creativity itself.[116]

Ritter's motivation to de-emphasize the "product" quality of his art is in agreement with the approach of Stephen Wilson who believes in *process over product*.[117] In order to de-emphasize the "product", some artists have turned to performance. However, interactive performances like Ritter's Nose Against Glass (1988) permit a musician--not members of an audience--to affect formal qualities of presented video images (see illustration 65). In this piece, the element of interactivity is reserved for selected musical performers, and viewers remain in the customary position of non-contact dictated by a performance-type of forum. Perhaps as a response to this contention, two of Ritter's most recent works have permitted viewers some interactive control: Intersection (1994) and Fit (1993) (see illustration 61).[118]

Regarding Toni Dove's virtual reality, performance-based work in which one individual also determined the interactive experience for an entire audience--Archaeology of a Mother Tongue (1993) (see illustration 16), Dove stated:

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[116] Ritter, interview.

[117] Wilson, "Interactive Art and Cultural Change," 255.

[118] In Intersection, viewers enter a large darkened room only to hear the familiar sounds of automobiles speeding by; however, when viewers stand in imaginary lanes, these auditory "cars" screech to a halt as though they are avoiding hitting participants. FIT, on the other hand, operates on a more visual level; as viewers approach an aerobics instructor displayed on a video monitor, the instructor starts to exercise in time with the participant.

> This person became the "driver" - a combination performer and camera operator who navigates through the adventure for an audience. This mode of presentation had powerful theatrical aspects, but curtailed the theatrical possibilities for one person in a virtual space because of the constraints of entertaining an audience. It also kept the audience somewhat outside the interactive experience.[119]

This statement may indicate that there is a preference among interactive artists for systems that monitor the actions of individual participants (as opposed to large numbers). Subsequently, artists are most likely faced with a choice; either create a work that can manage electronic data from a few individuals (or one), such as the works Telespecchio and The Automatic Confession Machine (see illustrations 56 and 62), or design work that fits into a performance type of forum so that a large number of people can observe the actions of a few, such as the works Archaeology of a Mother Tongue and Nose Against Glass. Otherwise, numerous synchronous interactive events may blur each individual's perception of an "action and reaction" scenario, and any potentially dramatic interactive effects will be lost. As Greg Garvey affirms, "...interactive art limits one viewer/user at a time in order to truly perceive the cause and effect relationships."[120] At the present time, a preference to create interactive artworks that monitor the actions of one or a few individuals may signify the artists' desire for viewers to have intimate personal experiences with "techno-art". Alternatively, it may indicate a limitation of the information-synthesizing capacity of the interactive technologies available thus far.

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[119] Dove, 285.

[120] Garvey, Thoughts on Interactivity, [1].

Reducing the Status of Art and Increasing the Status of the Viewer

The unconventional media often used in an interactive exhibit cause the re-assignment of the traditional role of the viewer from passive observer to active participant; indeed, this is *the* most important ingredient defining interactive work. The requirement for activity challenges the age-old gallery warning "Do Not Touch" enforced in museums, and replaces it with encouragements to "Touch, Act, Move or Speak" (see illustration 66). By creating a piece where the *viewer* becomes the *user*, the individual is integrated with the art work and the elevated status of "high art" is challenged. Breaking with the authority of previous centuries, the spatial and status differences between the observer and the artwork are altered so that the two entities merge for the duration of the piece and the status of the sacred, beautiful, art object often associated with protective glass is altered. Conversely, the status of the anonymous viewer is raised and is given the potential for creativity and individuality. As a writer on the arts, Robert Hough argues that interactive artists, particularly mail artists, attempt to reduce the high status of art and elevates what has been the low status of the art viewer:

> Mail artists, both electronic and traditional...have worked to crumble–rather than enforce–the hierarchy between the art producer and the art consumer. ...Electronic mail artists don't look upon artwork as sacred, as untouchable, and this sensibility gives the practice a wonderfully irreverent feel. ... The problem, unfortunately, is that a lot of artists and gallery owners do see art as sacred, and want nothing to do with electronically transmitted art. ...Most of the artists I met stressed that they had no intention of doing away with galleries. Instead, they were trying to forge a new context for looking at art, one in which the viewer is an active partner, and the art object isn't quite so darling.[121]

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[121] Robert Hough, "Beyond the Gallery", This Magazine 27 (November 1993), 18-19.

Disapproval of the what some view as the "darling" art object is not only transmitted through an alteration of the characteristics of the art object itself; one can also modify the context within which it is placed.

Going Beyond the Gallery Confines

Using their knowledge of telecommunication technologies, interactive artists have attempted to break out of the confinement of gallery walls, thereby modifying the environments that are deemed acceptable for the public consumption of art. Hough writes in his text "Beyond the Gallery":

> ...galleries are pompous and boring, the visitor constantly aware of imposed restrictions: You will not make noise, you will not touch the art, you will not laugh out loud... By imposing so many rules and restrictions, the gallery system has succeeded only in creating an environment that is antithetical to the creation of art; an environment that is stifling, self-absorbed and dull.[122]

Through their work, some artists have questioned the assignment of the terms *art producer* and *consumer*. For instance, telematic artist Roy Ascott believes that "the primary effect of the creative interaction within computer networks is to render obsolete the distinction in absolute terms between the artist and viewer as producer and consumer, respectively."[123] Interactive artist Stephen Wilson is also proud to challenge the role of *the gallery* for experiencing art. His piece Parade of Shame (1985) challenged home television viewers to call their local cable station and request changes to the computer graphic animation

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[122] Hough, 15.

[123] Roy Ascott, "Art and Education in the Telematic Culture," Leonardo Supplemental Issue *Electronic Art* (1989): 7.

sequences being broadcast.[124] Wilson's goal was to enter people's homes with his art, "I was able to develop a new context for artists to create events with which people could interact in their homes."[125]

The motive of "going beyond gallery confines" is not universal, however. Many interactive artists design work specifically for museums. When Carl Loeffler asked Lynn Hershman about the $2,500 price charged to museums for her interactive video disc Lorna (see illustration 59), she replied, "The reason it was done in a package was for museums. Promoting it this way, in essence, places videodisc players inside of museums. Once they have the players they'll be ready to buy more discs. In a way it becomes a kind of mass audience and allows us to do more."[126] It is suspected that Hershman and Wilson's target audiences differ. Hershman desires to reach regular (and perhaps more art-educated) museum visitors,[127] while Wilson's use of the television attempts to reach a larger audience that may not otherwise visit art institutions.[128]

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[124] Wislon's Parade of Shame ran on cable channel 35 in San Francisco, California, as part of the 1985 SIGGRAPH art show.

[125] Wilson, "Interactive Art and Cultural Change," 257.

[126] Carl Loeffler, "Discover the Truth About *Lorna*," Art Com 7/1, no. 25 (1984): 53.

[127] Yet within a museums' audience, Hershman states, "Interactive work demands that it be available and accessible on a mass scale." (Hershman, 435.)

[128] Hershman's approach has not guaranteed Lorna's success however. Toronto art critic Christopher Hume belittled Lorna, "The problem was that the user has to be a master of the technology to get anything out of it. The work... is one of those pieces that looks better on paper than in real life." (Christopher Hume, "Art Exhibit Gets a Laugh out of Technology," The Toronto Star, Friday, 19 June 1987: D16.)

Underlying Hume's criticism is a misunderstanding of the immaterial stimulus-response nature of the piece which arises from the traditionally accepted practice of not having to work, intellectually or physically, to experience art. It also bridges interactive art to the work

## PART II - VIEWERS' RESPONSES

With an understanding of the factors that have inspired artists to create interactive art, one can turn towards investigating viewers' responses as an indication of whether or not these artists have been successful at eliciting what they have sought from their audiences. The issue of effectiveness has been of concern to both critics and the artists themselves.

### Audience's Reaction to Interactivity

Psychologically, individuals can be drawn into an interactive work very deeply; this technological seduction reveals a significant penetration of their psyches by components within installations. Graham Coulter-Smith agrees that close connections often occur between interactive work and viewers. While describing Luc Courchesne's interactive work Portrait One (see illustration 34), Coulter-Smith reported, "As one asked questions, one developed an intimacy–quite unusual in traditional works of art--with the 'person' in the portrait..."[129]

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of Marcel Duchamp through a similar quote by Jean Clair who stated, "I believe that the work of Duchamp is actually the only work which can fully satisfy without really being seen." (Arman, 70.) Criticisms like Hume's may also indicate two things. Firstly, because the aesthetic properties of interactive artwork sometimes take on secondary importance in comparison to the element of responsiveness, viewers searching for traditionally-based qualities such as beauty may be unsatisfied. Secondly, comments like these may indicate that the experimental nature of this genre of work is resulting in an art that is aesthetically and/or stylistically immature. This artistic immaturity may be the consequence of artists working with new media, where more time is essential for the artistic development and mastery of these materials. Both of these conjectures have an underlying assumption, however, which is that the visual properties of artworks are important during the evaluation process regardless of any emphasis on interactivity.

[129] Graham Coulter-Smith, "Bitching About the Boundary... But Technology Leads the Edge," Eyeline (Sydney, Australia) (Autumn 1993): 17.

Myron Krueger also refers to the increased psychological effect of these technologies. In his interactive systems, he observed that people are psychologically linked to their "virtual" bodies:

> During the Metaplay exhibit, I observed a set of phenomena that I call 'videotouch.' People feel that their images are extensions of their identities. What happens to their images happens to them. What touches their images, they feel. They immediately accept the reality of any image that includes their own. For example, a person alone on the screen with a graphic object will touch it, half expecting it to react. If two people in different places find their images together on the screen, they will interact.[130]

As Krueger reports, this phenomenon becomes apparent when participants look down at their bodies when their images disappear from video screens.[131]

Participants have varying experiences within interactive environments. For example, after experiencing the participatory element of Roberta Friedman and Grahame Weinbren's interactive work The Erl King (see illustration 4), Regina Cornwell remarked on the unusual discomfort she felt as a result of both controlling the piece and being judged by onlookers, "While the more casual (i.e. non-participatory) viewers stood about the two larger monitors observing my efforts, I felt oddly vulnerable, and many of the images that I selected only added to my discomfort."[132]

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[130] Krueger, 148.

[131] Krueger, 149. Perhaps this behaviour is meant to reassure viewers that their "real" identity has not disintegrated or been permanently altered. Never-the-less, the necessity for a re-familiarization with one's physical body as a result of a "techno-excision", reveals the degree to which the viewer is psychologically seduced.

[132] Cornwell, 43.

People experiencing interactive pieces can be seen to behave quite differently from those observed in more traditional settings. David Rokeby says, "I think just about every imaginable kind of interaction has happened in the installation [Very Nervous System]. ... It has been a continuum from one extreme of people who are terrified, horrified and leave immediately, to people who become essentially intoxicated."[133] In this performance-based system, viewers' body movements are translated into musical sequences through the use of video cameras, complex computer software and pre-programmed, electronically-defined, musical instruments. Within the space of the installation, participants can create an indefinite number of "orchestral" compositions depending on their premeditated (or unintentional) body language (see illustration 63). Rokeby observes that people take various amounts of time to introduce themselves to his Very Nervous System because of self-consciousness:

> One thing that I've found is that the installation puts you in a position of some vulnerability in a social context. People who are shy and introverted often take a lot longer to allow themselves to really get into the system. On the other hand, people who are extroverted will go in quite quickly but tend to have quite fast but trivial experiences. Some of the most interesting experiences have been with people who are so afraid of going in that they have stayed on the periphery during an opening for instance, for hours, and waited until everyone else had gone in, and then spent hours themselves in it. ... It's not easy to move your body in public. Most of us are not trained dancers. And even for myself, I've been doing this for ten or eleven years now and I'm always being asked, 'show us how you move', and it's still not a completely comfortable experience for me. ...I mean, there's clearly the desire to have the experience in people and there's the fear. The conjunction of that desire and fear is, I think, very potent.[134]

As Rokeby explains, interactive systems can have a variety of effects on people ranging from fear to desire. Similarly in other interactive environments, particularly ones that use virtual

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[133] Rokeby, interview.

[134] Rokeby, interview.

reality technologies, there is the potential for users' psyches to be altered. With some works, certain individuals have been observed taking their learned realities away with them after interaction with the piece has ceased. Regarding his Very Nervous System, Rokeby remarks, "After 15 minutes in the installation, people often feel an afterimage of the experience, feeling directly involved in the random actions of the street."[135]

Problems and Paradoxes

Interactive electronic art, as a young genre of art production, still faces numerous problems, some of which will be outlined below. It is also in the early stages of developing its interventions into the traditional relationship between art object and viewer, and as such, is not without internal and external contradictions. Not only must interactive artists deal with "This isn't art!" proclamations from the uninitiated public, they must also deal with other, more technical problems associated with their interactive media.

To illustrate, Ginette Major--as previously mentioned, the Co-Director of the "Images du Futur" exhibition--reveals that there are specific problems associated with exhibiting interactive art. In an interview, she explained that some interactive works break down quite frequently and therefore require regular technical support. In addition, she states there are problems with labelling interactive works since some artists have protested against explicitly revealing the method of interaction.[136] Lastly, she warns that interactive art sometimes

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[135] Leopoldseder, Hannes, ed., Der Prix Ars Electronica - International Compendium of the Computer Arts, s.v. "David Rokeby", Veritas-Verlag, Linz, 1991, 132.

[136] Major, interview.

poses certain safety hazards that are associated with physical contact. In one case in 1993, Major had to remove from the exhibition an interactive work, Untitled Ball (1992) by Montreal artist Danielle Joliffe, because of a physical danger it posed to viewers. Consisting of a motor placed inside a smooth wooden sphere (65 cm or 26 inches in diameter), Untitled Ball would roll away from viewers as they approached. Ginette Major stated, "it was dangerous because the motor was too strong and it could hit the younger [children], and for a while the place was full of children younger than ten years old."[137]

As the example above demonstrates, artists must ascertain prior to the exhibition period the optimal interactive scenario between viewers and their work. This can range from choosing the most appropriate materials to varying the interactive methodology. Using David Rokeby's Very Nervous System as an example (see illustration 63), writer Don Hardy explains how Rokeby has experimented with varying the level of control available to users:

> The System can 'tighten down' so that it doesn't matter what activity takes place in front of the cameras--music will result. Or, alternatively, chaos can result. Rokeby says that ideally, 'there's a 50-50 balance. Fifty-percent of the music is in the performer's control within a set of constraints... If it's going to be interactive, then it should have that improvisational flexibility.'[138]

While one artist may chose to offer an "on/off" situation to the user, as in the case of Nancy Paterson's Ex(or)cisor (see illustration 67), another artist may offer such a multitude of choices to the viewer that it seems as though the endpoint is not within reach. The piece by American artist Sara Roberts, titled Early Programming (1989), offered the user "18 different

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[137] Major, interview.

[138] Hardy, 62.

topics of conversation, and about 1,500 phrases spoken in different tones of voice."[139] As already indicated, Lynn Hershman's piece Lorna, purported to offer 54,000 different video frames to explore through the system.[140]

But choices provided to the user must be presented in a very structured fashion; too many choices can confuse viewers. If the interactive element is not directly observable, users may become frustrated and/or disinterested. Greg Garvey has recognized this problem: "Attempts at generative approaches using mathematical techniques appropriated from chaos theory, randomness, growth or genetic algorithms run the risk of unintelligibility, where unlimited choices are overwhelming and essentially aesthetically meaningless."[141] To avoid shallow experiences, Rokeby explains that it is necessary to predetermine the optimal degree of user control:

> People don't have a sense of their freedom or their ability to interact unless there is a certain amount of constraint on the result of their interaction. So if you give someone total freedom to generate sound with their movements with no constraint to make it seem musical or to give it some recognizable language, they won't realise that they have any control at all. So up to a certain point, as you remove their control, they have a greater sense of control.[142]

Ironically, it appears that although many interactive artists have been motivated to empower

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[139] Sara Roberts, "Early Programming: An Interactive Installation," Leonardo 24, no. 1 (1991): 90.

[140] Loeffler, 53. One could be of the opinion that such a multitude of options can result in feelings of helplessness, not control--as if someone were lost in a sea of options.

[141] Garvey, Thoughts on Interactivity, [1].

[142] Rokeby, interview. When asked how the nature and degree of control was indicated to participants, Rokeby indicated that the manner of control was made clear "by giving each piece a fairly clear musical character."

viewers by providing cues for commands, their method of achieving this empowerment has been to provide an illusion of control–an illusion that, as the above quotation reveals, is more convincing the more that controls are denied.

Moreover, considering the oft-stated desire to liberate viewers from "the confines of the gallery", one might ask, have artists been successful at reaching a larger audience? Have audiences' profiles diversified as a result of the incorporation of interactivity in art? Telecommunications artist Sherrie Rabinowitz said in an interview that virtual reality technologies are created with "not just white-boy, it's *rich*-white-boy thinking." She jokes, "What are you going to do, give a VR system to someone in Nicaragua?"[143] This statement reflects the perspective that reality-imitating technologies like Myron Krueger's Videoplace, Nancy Paterson's The Machine in the Garden and Luc Courchesne's Portrait One are created with the technology-familiar user in mind (see illustrations 50, 19 and 34 respectively). But they are also created in some instances for inter-cultural users. Works like Rabinowitz and Galloway's Electronic Cafe (see illustration 30) that bring together audiences from different cities address the 'cross-cultural audience.' However, within the Western culture (and most of the works covered in this text) the implied audience for interactive works is often english speaking,[144] text-literate, computer-familiar and physically capable.

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[143] Ruth Iskin *et al,* "Design and Entertainment in the Electronic Age," Leonardo 27, no. 4 (1994): 350.

[144] The author acknowledges the vast number of interactive works that are created internationally that utilize languages other than english. A quick glance at page 559 of the International Directory of Electronic Arts 1995/96 reflects the sizeable number of interactive artists that utilize their native languages in their work, ie. French, German, Polish, Japanese, and Italian.

It has also been demonstrated that a primary motive of many interactive artists is to break the tradition of the physical passivity of viewers. However, when an examination of the levels of physical involvement is made within some "button-pushing" systems, what initially appears as a novel form of physical affectation may soon be deflated as viewers recognize that their activity involves little more than monotonous and standardized user behaviour.

In addition, what is presented as a form of creative selection (choosing A, B, or C) may depreciate into a gimmick that distracts viewers from recognizing that, to a large degree, most of their choices have been pre-determined. For example, in Hershman's Lorna (see illustration 59), the plethora of choices reflects a serious attempt by Hershman to increase the viewer's ability to affect the composition of the work. Yet, when participants are observed interacting with the piece, their behaviours involve the repetitious pattern of "button pushing".[145] Is the contact between fingertips and computer keyboard adequate as a convincing alternative for increasing interaction in art? If the ultimate motive is increasing the narrative options to the viewer, is this not an attempt to engage the viewer more conceptually, not physically, with an artwork?

The advertising poster for the sixth International Symposium of Electronic Art (ISEA 1995) invites viewers to "hear, see and *touch* electronic art"–a statement that further emphasizes the mandate for physical interaction with artworks by interactive electronic artists (see illustration 66). Yet works like Henry See's A Memory Project (see illustration 68) succeed at engaging the viewer's body on such a minute level (the fingertips), that one wonders if the

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[145] It is acknowledged that viewers are creating various narratives in the process, however, this argument responds to the collective artistic intent to deal with the physically passive viewer.

aim is to permit viewers only a very small amount of *physical* contact with the work.

Similarly, Mona Sarkis' interactive work Kaferlein (Little Beetle) (1992) (see illustration 69) offers a button-pushing scenario to the user in which ten dime size buttons may be pushed in any sequence to create sounds that, in tandem, may form German phrases. This type of redundant button-pushing activity does not contribute to an increased level of physical contact with art; viewers can easily obtain this level of interactivity by turning on kitchen appliances.[146] This level of interactivity may be historically significant due to its inclusion in the art domain in the last few decades, but this level of interactivity is nothing new to members of "high-tech" societies.

The promise or *illusion* of interactivity, is soon revealed to be as liberating as filling out a multiple choice test. Particularly in "button-pushing" interactive systems, the illusion of choice becomes more apparent when one realises that, regardless of the number of visual or auditory options that may be presented to users, the ability to creatively choose an option is highly restricted by the pre-determined options, creative talents and motivations of the interactive artist.

None-the-less, this "button-pushing" scenario has been deemed the method of choice by several electronic artists who are of the opinion that it is very well suited for specific types of experiences. In regards to his Automatic Confession Machine (see illustration 62), Greg Garvey explains that the translucency of these systems allows viewers to get to the underlying

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[146] This observation may be Sarkis' intent since she asserts that "true interactivity" cannot exist without artificial intelligence systems (see Chapter 3 - "Is There *True* Interactivity?").

messages of the work more quickly, instead of getting caught up in interactive methodologies: "Because of the similarity to a banking machine, the simple keypad user interface is easy-to-use for 90% of the population and thus the technology is transparent rather than getting in the way. ... It is almost entirely text based which merges the interactive experience with the convention of reading."[147]

Similarly, Luc Courchesne feels by using a button-pushing format, his interactive technologies will not present themselves as the most important element of the work, "My ambition would be to offer an experience where it won't matter to the visitor/user/actor which technology is used."[148]

Although the drive by artists has been to permit and encourage choice in the domain of art, particularly given the view that art has rarely permitted physical contact with the art object, an opportunity to touch a computer screen or keyboard may ultimately reveal itself to be a novel, yet art historically moderate, stepping stone. In contrast, a system that requires elaborate human behaviours to activate complex responses from the art object may be of more interest to the user and may also be more significant in terms of the potential for interactivity with the art object.

As a consequence of attempting to attract and engage viewers in interactive art, a further problem has arisen which can be loosely characterized as "undesirable viewer behaviour". The

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[147] Greg Garvey, Montreal, to author, Montreal, 4 August 1995, electronic mail [print out] held by author.

[148] Courchesne, electronic mail.

"leap-frog effect" is apparent in interactive art exhibitions such as TechnoArt (Toronto) and Images du Futur (Montreal). In contrast to the casual and often slow, meandering behaviour of people in traditional non-interactive exhibitions, the enthusiasm of viewers, particularly children, to experience the interactive parameters of each work can be overwhelming. Young viewers sometimes exhibit mildly aggressive behaviours in attempt to "have their turn" on perceived amusement park rides. In cases like these, it seems that the sole goal is to answer the question "how does it work?" Once the interactive mystery is exposed, even on a shallow level, pieces are often abandoned for other "games". Interactive artist Greg Garvey confirms, "A related problem is what might be termed premature imagibility (Oh I see, I touch the leaf and the computer draws a branch) that allows the viewer to dismiss the unfolding of the work over time. This 'I get it' syndrome undermines and subverts the creation of an architecture of time."[149] As a result of observations like these, artists have now begun to "scientifically" investigate the parameters that predetermine viewer satisfaction in interactive works.[150]

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[149] Garvey, Thoughts on Interactivity, [1].

[150] For example, Garvey has determined that there are five essential stages for a meaningful experience (Garvey, Thoughts on Interactivity, [1].):

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|---|---|
| Engagement: | the attract mode that gets the user's attention and holds it. |
| Revelation: | discovery and unfolding of the constituent elements. |
| Saturation: | the limits of attention span/interst and what information can be sustained by short term memory. |
| Consolidation: | the user derives meaning, pleasure, sense from the experience. |
| Disengagement: | the user slowly perhaps even reluctantly "backs out" of the work. |

With an understanding of the motivational factors, viewer responses and problems that have been associated with electronically interactive artwork, one can turn to a more in depth investigation of what exactly "interactivity" is and how it has been used by artists to alter the traditional art object/viewer relationship.

## CHAPTER 3

## UNDERSTANDING INTERACTIVITY IN ART

Although a brief examination of the term "interactivity" as it relates to art was made at the outset of this text, many of the details surrounding this term are still in need of discussion. The following is a more specific look at some of the particulars of interactive art, especially cases of "false" and "true" interactivity and some proposed models.

One question arises during attempts to define the nature of interaction in art; is it necessary for a *human being* to be the instigator of the interactive process? For example, in Kristi Allik and Robert Mulder's work Sky Harp: Eulogy for an Elm Tree (July 21, 1991) (see illustration 70), a tree bustling in the wind is the source of variables for what is termed by these artists as an 'interactive' piece.[151] In this case, a video camera records the swaying movements of an elm tree and sends data to Allik and Mulder's computer system. When the wind blows on the elm, corresponding digitized changes cause the branches to hit trigger points and cause sounds to be generated in large acrylic pipes located in a nearby pond. (Different trigger points cause various sound types.) "The environment is determining the composition that you hear," states Allik.[152] The leading question is, can this work be called interactive

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[151] Kristi Allik and Robert Mulder, Sky Harp, distributed by Kristi Allik and Robert Mulder, n.d., videocassette. At the end of the video segment on the Sky Harp, the work is categorized as "an interactive soundscape installation."

[152] Kristi Allik and Robert Mulder, videocassette.

if the interaction is not intentional, but instead, random? If a conscious decision to interact with the work is not present, is a circular information exchange formed or not? In response to these questions, my reasoning excludes this work from the interactive category because there is no analysis or interpretation on the part of the weather or the tree. It is an example similar to the installation Drawing the Line - a Lesbian Photo Exhibit mentioned earlier (see illustration 1). Although the work Sky Harp is responsive, it does not interact with a viewer, a criterion necessary when considering how interactivity has challenged the history of the art object and viewer.

There are also pieces that initially appear to be interactive but are not. For example, when I watched a performance of Le Partage des Peaux[153] I came to the conclusion that the piece was interactive for the following reasons: from head to toe, the performer's body was connected to wires and cables that merged at her tail bone and dragged behind her for the duration of the show; these cables alluded to computers located behind the audience; the sounds originating from the performer--Isabelle Choinière--seemed to be instantaneously transformed electronically; and, the lighting effects during the performance seemed to mimic the movements of Choinière's body. Only during an interview with the artist one week after this performance did I discover that the performance was not interactive. When I asked why the performance appeared interactive but was not, Choinière responded:

> There is a confusion between virtuality and interactivity; true, we created a virtual being in the work but when people see virtual environments, they think it is interactive but it is not necessarily. A lot of people thought that it was interactive because there was 3-D animation and because we had me

[153] Les Partage des Peaux was performed on the following dates: 10, 11, 15, 16, 17, 22, 23, 24 September, 1994. The performances were held at Galerie la Centrale in Montreal, at 279 Sherbrooke West, Suite 311-D.

> hooked up to a wire system. But we couldn't do it interactively because the technical developments with the technologies have not been fully developed yet.[154]

Choiniere explained that hooking up her body to dead wires during the performance was for visual effect only--an effect that was meant to refer to the complex technologies that were used prior to the performance in order to create the virtual beings or "other skins" which were projected to the audience.[155] The interactive component was illusionary and may also be so in works by other artists.

*Human Conversation as a Model for Interactivity in Art*

To understand interactivity in art, one can use human conversation as a model. Interaction between humans is instigated as one person presents either a question, comment, choice, or physical gesture, etc., to a second person for feedback. The second person interprets this "stimulus" and responds accordingly, even if the response is to ignore.[156] In the same regard, interaction with machines, in art or otherwise, should possess the ingredient of feedback. If it does not, the interactive component is at best ambiguous.

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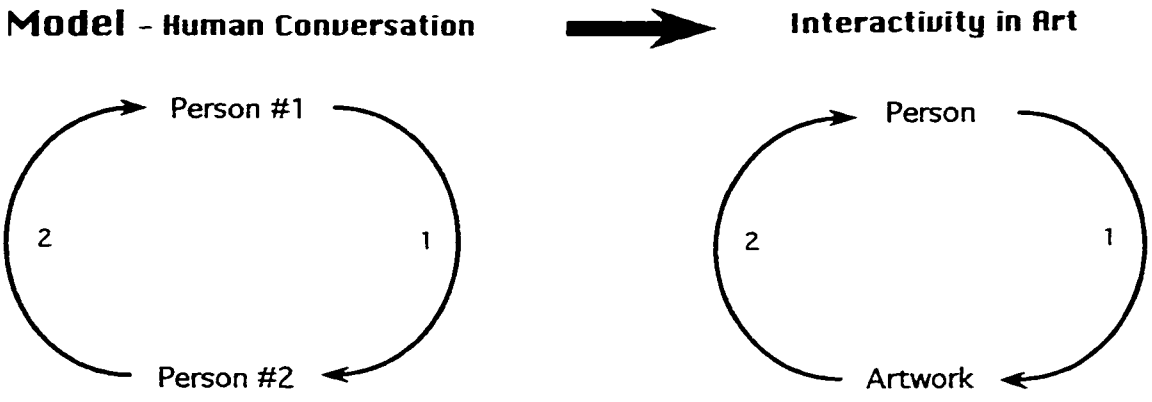
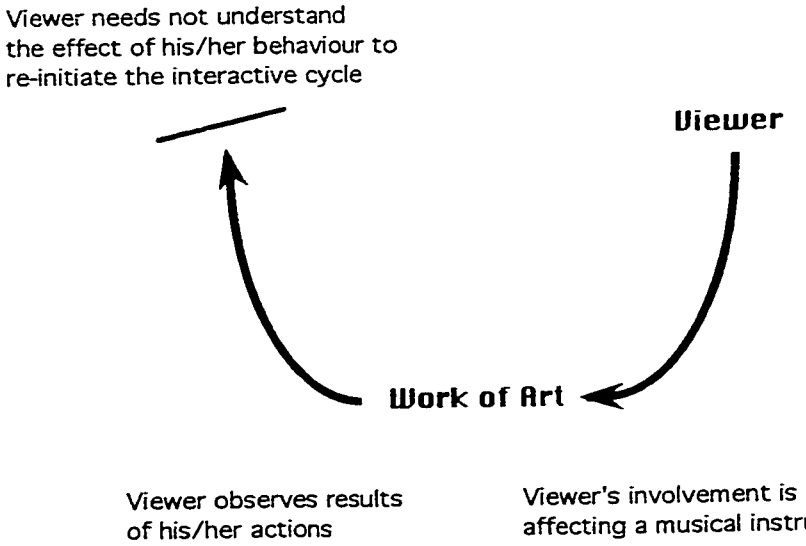
[154] Isabelle Choinière, interviewed by author, 27 April 1995, Montreal, tape recording held by author.

[155] Choinière, interview.

[156] If a person decides to ignore the "stimulus" presented by the instigator of a conversation, the behaviour of "ignoring" can still be considered as a response, and thus, the model of human conversation is still applicable as a mode for examining interactivity in art.

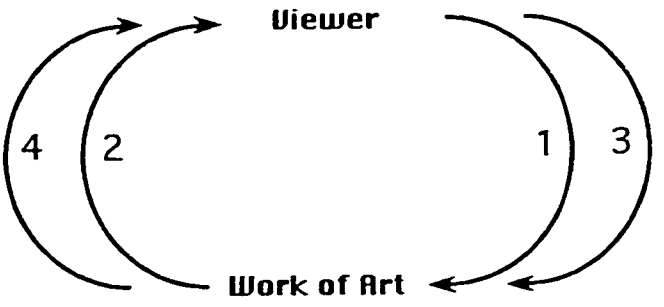



On another level, one must consider the degree to which interactive works cause continued cycles of information between two parties. In other words, does the exchange stop after one cycle is completed? An analagy of this situation would be an individual pressing keys on a piano; everytime a key is pressed, the piano "responds" by producing a sound. Is it crucial that participants analyse each sound in order to re-interact? No.[157] Therefore, this type of interaction can be viewed as not consecutively dependent.




[157] Although piano players can intentionally create compositions, the action of hitting one key *does not neccessarily* depend on the keys previously pressed. In this way, continued interactions are not interdependent.

Let us consider David Rokeby's Very Nervous System (see illustration 63) which involves a stimulus-response setup whereby physical movements are translated into musical phrases or sounds. The participant can vary in numerous ways the chorus of music generated in the space provided. An examination of the information pathway in this case reveals that information goes first from individual to machine as initiation of the cycle begins; the machine responds by producing sounds. Do these sounds affect the participant in a reactive way or do they encourage tandem behaviours? The participant may analyse the sounds heard and counduct subsequent movements correspondingly but this is not required during participation with the system. Analysis of the sounds offered by the work of art is not a necessary ingredient for further activations. Therefore, the cyclical nature of our model of interactivity is arrested at the point after the artwork reponds to the viewer. This lack of secondary human analysis may cause participants to become disinterested in the work prematurely because an expectation of in depth interactivity is unsatisfied. One might conclude then, that "true" interactivity must involve some form of analysis observable in both interacting parties. If so, the following schema would most aptly simulate interactivity if based on a model of human conversation.




*Artwork must analyse viewers' responses for each cycle to continue*

*Interdependent cycles are initiated by participant*

Some critics believe that in order to create a truly interactive piece, the work must be able to respond in an unpredictable, yet structured, fashion as though the piece could "think" for itself. This would translate into information exchanges that are self-perpetuating instead of ones that are analagous to performing an instrument.

Is There *True* Interactivity?

Interactive artist Mona Sarkis stated in a 1993 video recording that only with the incorporation of artificial intelligence systems (AI) might one speak of true interactivity.[158] The presence of AI in art machines would offer the user a system whereby the machine "thinks" creatively instead of merely calling forward predictable pre-established responses. Sarkis' belief that true interactivity can only be achieved through AI systems has been challenged in Norman White's interactive sculpture Helpless Robot (see illustration 24), according to Earl Miller. He states, "the robot 'learns' how to successfully elicit aid from people. Thus each random encounter with the audience contributes to the ongoing development of the piece ... initiated through the workings of the computer's artificial intelligence."[159]

Glen Cooly confirms the presence of an artificial intelligence system in the Helpless Robot stating that "this electronically-controlled cybernetic sculpture is based on an autodidatic

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[158] Diamond, videocassette. Segment "Kaferlein (Little Beetle) - Mona Sarkis." Sarkis states, "...as long as there is no artificial intelligence, there will not be any true interactivity".

[159] Earl Miller, "The Phase Show," Parachute 55 (July/August/September 1989).

model of artificial, or simulated, intelligence."[160] But is the purported presence of an AI system in the Helpless Robot a fallacy; does its pre-programmed stimulus-response scenario constitute an artificial intelligence system? If so, the technologies would literally be thinking and learning by themselves.[161]

Artists and art writers have distinct opinions on the subject of AI. Roger Malina states, "There are a number of attributes that could allow the computer to become a creative art-making machine rather than merely a significant artmaking tool. These attributes include the ability to have an in-built learning capability...".[162] Peter Kugel, a writer for Leonardo, believes that the digital computer is already a 'thinking' machine. He states, "If any machine can be constructed to 'think' or be capable of what is called Artificial Intelligence (AI), it is now believed that the digital computer is the machine. ...if digital computers cannot be programmed to behave intelligently or to provide AI, then AI cannot be achieved by any machine."[163] If we take Hubert Dreyfus's opinion that computers are limited in terms of their ability to be "intelligent" (due to properties elucidated in the article "Why Computers

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[160] Glen Cooly, "The Phase Show," Parachute 57 (January/February/March 1990): 41-42.

[161] There is a considerable debate on the existence of artificial intelligence (AI) in machines. Of the numerous books that have emerged on the subject, two introductory texts outlining the controversies, definitions and history surrounding AI are: Henry C. Mishkoff, Understanding Artificial Intelligence (Indianapolis, Indiana: Howard W. Sams & Company, 1988), and Derek Partridge, A New Guide to Artificial Intelligence (Norwood, New Jersey: Ablex Publishing Corporation, 1991).

[162] Malina, 36. Perhaps the reason that true artificial intelligence has not been significantly incorporated into the process of art making is that it would result in the reduced need for the artist and therefore the unfulfillment of the human race's creative instinct and the suppression of individual expression. One could also argue that it would result in the dilution of the value of the art object as a referent for human activity.

[163] Peter Kugel, "Artificial Intelligence and Visual Art," Leonardo 14 (1981): 138.

Can't Be Intelligent"),[164] then one can conclude that artificial intelligence in computers is unachievable no matter how much it is desired.

None-the-less, interactive artist, Stephen Wilson, in his article "Computer Art: Artificial Intelligence and the Arts,"[165] would probably place White's Helpless Robot into a group of work that incorporates AI due to its human-like sensibility that interacts "intelligently" and learns from experience (see illustration 24). In 1983, Wilson predicted the creation of a sculpture like Helpless Robot, "Imagine, for instance, a sculpture that solicits and understands comments [or actions] from viewers and responds in accordance with a personality provided to it by its sculptor."[166] By Wilson's definition, true interactivity has indeed been achieved by White. Similarly, Wilson's perception that "audio-kinetic works, that is, those whose motion or whose illumination of sculptured parts or of images on a screen respond to variations in intensity or in frequency of sounds, might be said to behave intelligently" would place Soundings (1968) by Robert Rauschenberg into the artificial intelligence--and thus truly interactive--category (see illustration 48). This counteracts Sarkis' assertion that AI has not yet been achieved in interactive models.

Wilson communicates his certainty about the existence of true interactivity with his 1980 work Responsive Linking Piece No. 1 that claims to be an artificial intelligence installation (see illustration 71). This work tried to establish unique ties with viewers. While sitting at a

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[164] H.L. Dreyfus, "Why Computers Can't Be Intelligent," Creative Computing (March 1980): 72.

[165] Stephen Wilson, "Computer Art: Artificial Intelligence and the Arts," Leonardo 16, no. 1 (1983): 15.

[166] Wilson, "Computer Art," 15.

computer, viewers type in information akin to answering multiple choice questions. After each response, the computer presents a graphic image on an adjacent video screen and emits various sounds. At the end point, these graphics are combined "so that the viewer at the end of the program is presented with a final design that is unique for the viewer, since it is a cumulative one based on the viewer's answers."[167]

From this brief discussion, it is evident that even among interactive artists, there is no consensus as to whether or not true interactivity exists and, if it does exist, whether or not it has been successfully incorporated into interactive artworks thus far.

Are Holograms Interactive?

Another issue that comes into play when attempting to define the nature of interactive artworks is the question, "Are holograms interactive?" Ginette Major, the Co-Director of the Images du Futur annual exhibition in Montreal, is of the opinion that holograms *are* a form of interactive art. When this question was posed in an interview, she replied, "Oh yes... You have to move when you look at the hologram, otherwise you'll only see one exposure, while there may be some fifty exposures."[168] Although they can be appreciated for sculptural qualities, the images housed within transmission and reflection holograms offer illusions of depth despite their existence as two dimensional planes. Consider two holograms, Rudie (1989) by Ana Maria Nicholson and Vers la Flamme (1991) by Shu-Min Lin (see illustrations 72 and 73). In order to experience their illusionary depth, the viewer must continually re-

[167] Wilson, "Computer Art," 19.

[168] Major, interview.

position his/her body. Viewer movement may initially suggest an interactive component in the work.[169] But, it has already been concluded through the examination of Juan Geuer's piece Self Portrait (see illustration 2) that a re-positioning of one's body in order to view a static art object does *not* constitute interaction. Nevertheless, holograms do go further than a static piece of sculpture, given the coefficient for variability in the work--a variability which is under the control of the viewer.[170] This coefficient suggests that holograms may belong in a hybrid domain of quasi-interactivity.

To complicate this issue further, one can ask whether or not holograms are affected by viewers. Do holograms complete the cycle of 'human act-> work respond-> human respond'? Do viewers have the opportunity to alter the composition of the piece? Does the act of seeing holograms from new angles constitute the creation of new compositions by the viewer? The answer to these questions is 'No.' Holograms are fixed in time. Furthermore, holograms are not interactive because they do not simulate the model of interactivity illustratable through human converstion (see pages 71 and 72). Therefore, although holograms may

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[169] The presentation of new angles of images seen when altering the position of one's body while viewing a hologram can be considered very similar to the activities undergone by the viewer/participant in the "pathway/explorer" classification explained in detail in Chapter 4.

[170] Arguably, this body positioning is necessary for the viewing of any two-dimensional work. Yet, most drawings and paintings operate on the assumption that the viewer's viewing space is perpendicular to the surface of the work. The two types of holograms--reflection and transmission--are characterized by how light travels once in contact with the surface of the work. With reflection holograms, viewers look at one "face" of the work, and therefore the work can be considered part of a two-dimensional viewing plane. Conversely, with transmission holograms, viewers can walk around to see them from both sides; this behaviour is more akin to viewing static works of sculpture. Regardless of the distinction between these two forms of holograms, however, the same conclusion can be drawn, that is, that a requirement for altering body positioning does not necessarily constitute interaction with a work of art.

require viewer participation through their body movements, they lie outside the given definition of interactivity and will be treated as non-interactive in the remainder of this text.

The Art Lies in the Laws of Cause and Effect

There is a consensus amoung interactive artists that their art is not based on the assumptions of older art forms, but instead, is the result of an artistic drive to design and manipulate electronics, computers and software, etc., in a creative manner, not just to use these materials to mimic previous art forms. As Myron Krueger explains about interactive works, "the laws of cause and effect are composed by the artist."[171] Roger Malina also feels that "the software is the art," and that "digital information is inherently plastic because the way that it is stored allows it to be easily changed."[172] Interactive artist Stephen Wilson agrees, "My stress on the process is consistent with the belief held by many artists that contemporary art [should] focus more on the process and tools of art making and less on the particular products."[173] Interactive art certainly focuses less on the "particular products" or *objecthood* of the creative process and more on the immaterial quality inherent in the stimulus-response relationship. American interactive artist Rebecca Allen learned this when she realised that "computer programs... were as much of an art form as the resulting computer graphics or

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[171] Krueger, 149.

[172] Malina, "Digital Image," 33. Malina also states, "Not only is the software the art, but the behaviour of that software constitutes the work of art in the age of post-mechanical reproduction." (p.37.) In contrast to the monotonizing properties of mechanical reproduction (see Benjamin), the aim of post-mechanical reproduction is "to make copies that are as different as possible from each other, but are constrained by a set of initial rules." (p. 37.)

[173] Wilson, "Interactive Art and Cultural Change," 255.

animation."[174] Don Ritter explains, "In the case of interactive art, the formal structure of that work changes by your presence... The form is a responsive environment. ...The work is completely intangible."[175] David Rokeby also asserts the belief that the art lies within the electronic parameters of cause and effect. In an interview, Rokeby stated that when a piece is not activated by a participant, the piece ceases to exist, "When no-one's there, it's not there. When people are there, it's there."[176]

* * * * *

Using the aforementioned concepts of "interactivity", an in-depth examination of the ways in which electronic interactivity has affected the art object/art viewer relationship can be attempted. The following chapter does so by proposing two main categories of complex electronic interactivity in electronic art, namely "pathway/explorer" and "cocreator" classifications.

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[174] Iskin, 349.

[175] Ritter, interview. See also Mary Anne Farah, "Machines in the Garden: Interactive Video Art - Bringing Video to Life," Parallelogramme 18, no. 4 (1993): 48.

[176] Rokeby, interview. See also Farah, "Machines," 48. This philosophical argument of Rokeby's can be applied to every object within the range of human senses. But one can say that the piece is still there when no-one is interacting with it. It is merely in an inactive state; the piece comes alive when activated. This perspective down-plays the value or emphasis placed on the visual aesthetics of the material components used to house the piece.

## CHAPTER 4

## TWO MAIN CATEGORIES OF INTERACTION IN ELECTRONIC ART

An analysis of a large number of interactive electronic artworks reveals that two main classifications can be formulated with respect to the degree and quality of interaction between the art object and the viewer.[177] The following discussion will focus on a taxonomy that distinguishes between "pathway/explorer" and "cocreator" modalities. These terms have been designed to distinguish between different modes of interaction, and at least in part, to echo, indeed clarify, the ideas presented by some artists in the field. For example, Montreal based interactive artist Henry See states:

> Interactivity in hypermedia is one sort, mostly limited to button clicking, choosing which path will follow next. In other work, such as David Rokeby's [Very Nervous System], interactivity is body movement in space. There is little in common between these two forms of interactivity. And they are not the only two forms.[178]

It might be mentioned at this point that the two types of interactive art to be discussed in the ensuing pages occur roughly in equal frequencies, although no attempt at a statistical

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[177] It must be stressed that these are "main" classifications; the author recognizes that one could group and re-group interactive art into various other categories using different characteristics. It is also likely that there are works that exist outside of these classifications or are a composite of both. The use of these classifications attempt to recognize similarities and distinctions between works and ultimately to express the different motivations for interactivity between artists.

[178] See, electronic mail.

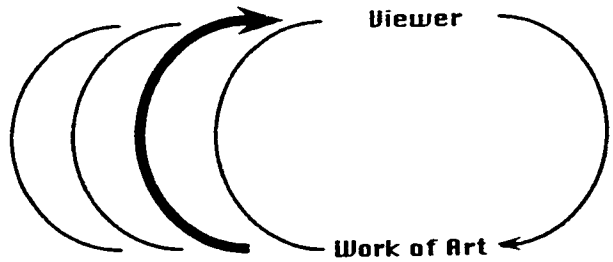
analysis of their numbers has been formally attempted. In other words, the author has not noticed a dramatic proliferation of one type over the other. One might point out, however, that the circulation rate of the "pathway/explorer" type of work may be more facile since many of the works within this category can be copied and/or exhibited on personal computers.[179] In contrast, this is not so easily achieved with many "cocreator" works, the complexities of which are soon to be explained.

The Pathway/Explorer Classification

The emergence of the "pathway/explorer" grouping is important to the history of the art object and the viewer because it was the first mode of interaction, electronic or other, that offered viewers *several* options from which to *choose* at each interactive step.

**Pathway / Explorer**

***- Complex Electronic Interaction -***




*Many Options are Presented*

*Viewer Intentionally Selects One Option*

In this type of interactive art, after each choice is made, the artwork responds by providing a new set of variables or "directions" for the viewer to consider. In this way, viewers are

[179] Henry See's A Memory Project, for example, can be copied from one MacIntosh computer to another.

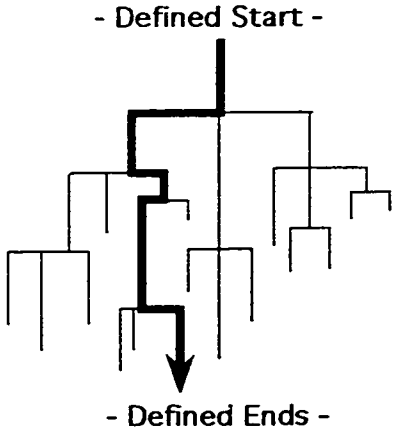
somewhat conscious of the direction they are pursuing, although they may not be certain of the consequences associated with each choice.

In the pathway/explorer category, viewers have the ability to push buttons on an electronic keyboard (or a similarly functioning device) which allows them to create connectable 'scenes'. In this way, viewers can create numerous, variable narratives. This type of exploration--analogous to following the separating branches of a tree--gives one a feeling similar to playing an adventure-type video game where all of the possible options could be explored if one had unlimited time.

In most cases, viewers begin to investigate pathway/explorer works at the same point, be it a video frame, audio emission or other stimulus. Regardless of the paths taken however, there are *defined ends* to the pathways which signify the eventual "closure" or termination of the work. The figure below maps out the nature of this overall dynamic.

**Pathway / Explorer**

***- Complex Electronic Interaction -***



A typical example of the pathway/explorer classification is Lynn Hershman's piece Lorna (1980-84) (see illustration 59). A viewer sitting in front of the system touches the screen of a video monitor in certain marked places in order to explore the home life of the main character--"Lorna".[180] Making choices at each cue leads the viewer to a new set of alternatives. The continuing presentation of options sometimes gives the impression that the artwork houses countless routes for investigation, and indeed, it does offer some 54,000 frames for the viewer's potential persual. Hershman described this exploration process when interviewed for Carl Loeffler's article "Discover the Truth About Lorna": "You get a set of instructions and you make choices as to what chapter you want to go to. Each arrow on the branching system leads to the place a given choice will take you. Each choice leads to several other choices--it's a labyrinth of options."[181] But in her own article "Touch Sensitivity and Other Forms of Subversion: Interactive Artwork", Hershman refers directly to the branch-like formal composition of the work, "Every object in Lorna's room is numbered and becomes a chapter in her life that opens into branching sequences. ...The viewer/participant activates the live action and makes surrogate decisions for Lorna. Lorna's choices are designed as a branching path."[182] This "pathway/explorer" artwork leads viewers to 36 possible chapters and eventually to three possible endings.

Another interactive work of Lynn Hershman's--Deep Contact (1986-89) (see illustration 25)--created in collaboration with Sara Roberts, operates in a similar fashion; viewers are asked

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[180] Ironically, the main character "Lorna" is an agoraphobe--a person of ultimate passivity.

[181] Loeffler, 53.

[182] Hershman, "Touch-Sensitivity," 433-434.

to touch the screen of a video monitor in order to direct the sequence of events.[183] In this work, images are revealed of "Marion"--a stereotypical "sexy" female. Her sultry persona invites viewers to touch the screen, in effect, to touch different parts of her body. By touching the screen, the viewer explores the branching system of choices that lead to various sub-plots.[184]

Interactive artist, Jeffrey Shaw, now living in Karslruhe, Germany, has created several interactive artworks which also use this branching system, although in a different manner than the "button-pushing" or finger-contact examples previously reviewed. The work The Royal Road (early 1990s) requires a participant to walk along a foot path lined with pressure sensors; doing so triggers the presentation of video imagery. Shaw has discussed the role of the participant as being akin to that of an *explorer*:

> The Royal Road dramatizes one of the paradigmatic modalities of an interactive art work which is the notion of the viewer as traveller who enters and explores a virtual space of stored audio and/or visual information. In The Royal Road this metaphor of the journey is made quite explicit--the viewer actually walks towards and into the artwork to elicit its process of self revealing.[185]

In another work by Shaw, The Legible City (1989), the viewer rides on an electro-mechanical bicycle through computer-simulated cities. However, the buildings are replaced by letters of

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[183] Initially, viewers are drawn to the work because an image of themselves is captured on a surveillance video and shown on the computer screen in front of them. The branching system then unfolds with further physical participation with the work.

[184] Tory Dent, "First Person Plural - The Work of Lynn Hershman," Arts Magazine 65, no. 3 (November 1990): 89, and Hershman, "Touch-Sensitivity," 435.

[185] Jeffrey Shaw, Modalities of Interactivity and Virtuality in Art. Text distributed by Jeffrey Shaw, Karlsruhe, Germany, 1994, 2.

the english alphabet that, when read in sequence, provide information about the mapped cities and their famed personalities. The participant can pedal at varying speeds, turn left or right, reverse direction, and can choose, via multiple choice button-pushing, one of three city environments: Manhattan, Amsterdam or Karslruhe.[186] The inability to step outside this framework keeps the participant in the role of "user" of the system, and thus, as shall be shortly explained, excludes users from the alternate role of "co-creator".

The same scenario is true of the work Bicycle TV by Toronto artist, Nancy Paterson (see illustration 64). This work is quite similar in nature to Shaw's The Legible City.[187] With Bicycle TV, a participant sits upon a 1950s woman's bicycle that is connected electronically to a computer and video screen. As the participant pedals, real-time video imagery is presented depicting a small southern Ontario town. Cued by directional arrows, the participant controls his/her direction and speed through a network of virtual roads. The "pathway/explorer" classification is thus established as the participant chooses between two or three routes at each prompt. In the two cases of Bicycle TV and The Legible City, the viewer's venture into virtual landscapes parallels their exploration within the interactive program.

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[186] Shaw, 3.

[187] Although the work Bicycle TV has been exhibited extensively in Canada, the U.S., Europe and Australia, it was highly criticized during one comparison with Jeffrey Shaw's work Legible City. When writing about Shaw's piece, Australian lecturer in art theory and history Graham Coulter-Smith stated, "At first, the sight of [Shaw's] bicycle reminded me of the utterly boring bicycle plus interactive video disk at TISEA [Paterson's Bicycle TV at the Third International Symposium of Electronic Art], situated in the foyer of the Museum of Contemporary Art [Sydney, Australia] last November. This work, involving a predetermined ride through the Canadian countryside, was indicative of an artist who has an extensive knowledge of technology but absolutely no aesthetic imagination whatsoever." (Coulter-Smith, 16.)

Another Canadian artist, Luc Courchesne, presently a Professor of Design at the University of Montreal, has created several interactive artworks of the "pathway/explorer" type, two of the most recent works being Portrait One (1990) and Family Portrait, Encounter of a Virtual Society (1993) (see illustration 34). In the videodisc work Portrait One, participants respond to questions in text form which are posed by several virtual beings displayed on computer monitors. In a similar way, Family Portrait--having derived from Portrait One--involves four podium-like stations where participants can interact with these virtual beings. Intimate dialogues can occur between viewer and artificial being. However, the paths determining these interactions can lead to unexpected dramas. Courchesne explains, "visitors make contact with any of these virtual beings by asking questions from a computer screen. As they get to know one another, and as certain topics are brought [up], arguments may break out between members of this virtual society."[188]

On/Off Sub-Classification

Unlike the complexity of Courchesne's Family Portrait, many pathway/explorer works operate in an "on/off" capacity whereby viewers operate the piece as though it were a light switch. Such is the case with works like Nancy Paterson's Ex(or)cisor (1993/4) and Roland

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[188] Patrick D. Prince, "Interacting With Machine Culture," Computer Graphics 13, no. 5 (September 1993): 4-8. The following is an example of a possible conversation between a viewer and a virtual being named "Marie" which demonstrates how certain responses by a viewer can terminate the dialogue (Luc Courchesne Interactive Portraits 13 November 1993 to 9 January 1994 (Ottawa: National Gallery of Canada, 1993): 6.):

| | |
|---|---|
| Marie (M): | "So you take an interest in art ... In the art market?" |
| Participant (P) may respond: | "I am a collector." |
| M: | "You are a collector! Are you interested in me?" |
| P: | "Yes..." |
| Marie spits out her reply: | "Speak to my agent." |

Brener's Bad Trick (1989) (see illustrations 67 and 74). The Ex(or)ciser necessitates an "on/off" interaction between a participant and a 1950s' belt massager--a device designed to help women lose weight by shaking away their fat.[189] In an interview with Nancy Paterson in Toronto, she commented on how viewers are sometimes disappointed with the "on/off" nature of Ex(or)ciser, "People see it and they go 'it's not interactive enough.'" But Paterson contests, "It's like reducing interactive art down to its lowest common denominator."[190] She also admits that for Ex(or)cisor, the degree of interaction was not her main interest,

> I would personally not worry about the degree or ramifications about the level of interaction...Interactivity is simply the result of combining a computer with whatever you are doing. Video by itself is interactive if you hit play and stop. It's more important that you marry a computer to it and then the potential isn't just its interactivity.... Interactivity is just a small part of what then becomes possible.[191]

Although "on/off" works like Ex(or)cisor utilize electronic components to provide an interactive dimension, they operate in a way most appropriately described as *simple* interaction in opposition to those labelled *complex*.[192] With this distinction, they can be seen as a rudimentary form of electronic interactivity which is limited in terms of any profound impact on the art viewer/object relationship.

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[189] In Paterson's Ex(or)cisor flicking the switch on the belt massager triggers the presentation of video clips on the video monitor ahead which shows images of nuclear technology, women exercising and television evangelists.

[190] Nancy Paterson, interview with author, 22 November 1992, Toronto, tape recording held by author. See also Farah, "Machines," 52.

[191] Paterson, interview.

[192] For visual representations of simple and complex interactions, one can view the graphics on pages 71, 81 and 90.

An important question is, do "on/off" interactive works fit into the dual classification system previously mentioned, or are they worthy of their own category? In other words, should "on/off" works be viewed as the most basic level of the pathway/explorer category, or as a separate category that provides one interactive choice. For example, the work by the South African artist Roland Brener Bad Trick does not provide several choices to the viewer; a viewer's presence is recognised by a motion detector and the piece commences its presentation. If the interaction between viewer and artwork is so rudimentary, one must ask the following question: Is the significance of the viewer turning the work on and off merely as an energy saving device?[193]

In response to these questions, I would argue that the interactive potential of this type of work can be viewed as representing a stunted form of the pathway/explorer genre of work, whereby there are only two options available to the user--"on" and "off". In this way, these works offer viewers an involvement similar to that of early interactive works such as Robert Morris' I-Box (1963) or Yaacov Agam's Metamorphosis (1957) (see illustrations 23 and 22 respectively) except that their method of interaction is mediated by electronics.

Despite the range of interactive options available to users of "pathway/explorer" works, some interactive artists such as Toni Dove have opted against these formats because of the belief that they offer viewers only *illusions* of choice and control. Dove writes:

> I approached the concept of interactivity with some resistance, wondering

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[193] In the case of Bad Trick, the effect of the "on/off" interactive element may be to startle viewers into paying attention to the work. In addition, viewers may get a sense that the work is "talking" to them because it started to communicate when they approached, just as another human being might.

> why I should replace intellectual challenge with multiple choice. The process of mapping--elaborate logic trees with all possible choices predetermined--seemed tedious and impractical and the concept of "choice" seemed a deceptive fallacy. ...there is no real choice in a mapped interactive matrix. Choice is preprogrammed. It has struck me that this illusion and the false empowerment it engenders are akin to the manipulative tactics of advertising. Both are strategies of control through manipulation that tend to produce shallow results.[194]

As a result of her search for alternatives, Dove adopted a 'cocreator' method of interaction for her art. Dove concluded that the 'cocreator' system provides more interactive depth and therefore enhances the viewer's experience, "This concept was different from the elaborate mapping that predefines and controls each possibility or connection and [which] seemed a barrier to the possibilities of real depth in interactivity."[195]

The Cocreator Classification

The 'cocreator' classification is a step towards further interactive complexity. In addition to the presentation of several choices to the viewer, cocreator systems are often designed to simultaneously analyse several sources of information from users. In this regard, the exchange of information from art viewer to artwork has been increased in comparison to the pathway/explorer method of interaction.[196]

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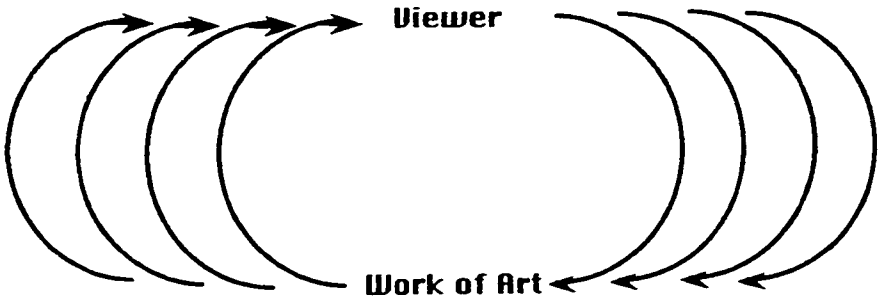
[194] Dove, 281, 282.

[195] Dove, 281.

[196] The emergence of the "cocreator" type of work should not be considered the most technologically advanced, or recently developed, method of electronic interactivity in art. Cocreator works have been explored as early as the emergence of electronic interaction in art as exemplified by the work of Myron Krueger, who was developing cocreator systems as early as 1969 (see illustration 50).

**Cocreator**

*- Complex Electronic Interaction -*




*Multiple Inputs Come From Viewer -- Large Degree of Inadvertant Selection*

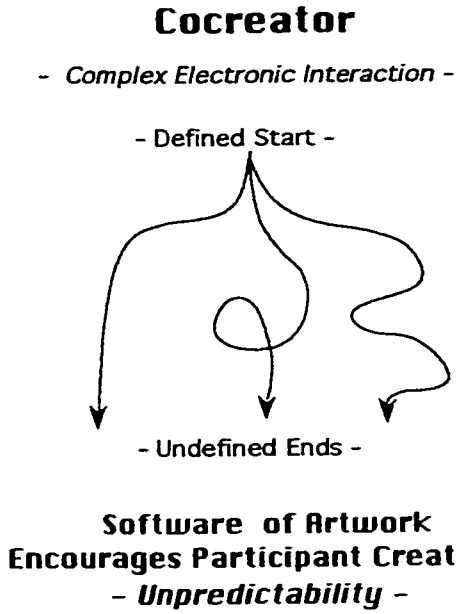
*Multiple Outputs are Produced by Artwork*

In the 'cocreator' classification, each participant has the ability to experience and/or create the piece in a different way because the installation is set up to allow for minute personal variations that sometimes make the works more aptly referred to as performances than installations.[197] Most importantly, in the cocreator classification, the participant can create something in addition to what was predesigned by the artist. In contrast to the pathway/explorer classification, the creative potential of each "cocreator" user is further emphasized. The participant is not restricted to the defined ends of the pre-set pathway/explorer branching system; the interactive branching system becomes open-ended where viewers can create effects not strictly predetermined by the electronic artist.

Although the participant cannot alter the parameters of the responsive environment (he/she must respond within it), the participant is often able to create unique images or sounds

[197] This classification type is more like a performance because the viewer literally "performs" the work in the same way that a musician performs an improvised piece of music.

through their interactions with the system; the results are sometimes bizarre and unpredictable. In this way, cocreator viewers start with a given set of parameters and finish with a secondary product not envisioned even by the artist.[198] The artist has created open-ended artworks where each viewer is the ultimate completing ingredient.




In addition, participants must often use their limbs, vocals chords, and/or entire bodies quite extensively to explore the potentials for interaction in cocreator systems, departing from the typical fingertip contact of many pathway/exlorer works. In this way, the method of information exchange between art object and viewer is more physically involving than the pathway/explorer type.

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[198] It can be argued that designers of cocreator systems can predict the outcome of viewers' interactions to a large degree. However, the open-endedness of these systems and the potential for analysis of several information sources at once, preclude the moment-to-moment forecasting of results even by the artists.

In this classification, the issue of the role of the viewer can be examined once again. It has already been demonstrated that most, if not all, interactive artists wish to alter the status of the passive viewer by empowering them with activity, choice and individuality. In the cocreator classification, the participant's power is emphasized further than in the pathway/explorer classification; the participant becomes *co-artist* because of the available power to create a *sub*-artwork. Even through the act of inadvertant selection, a *sub*-composition is often creatable within cocreator systems. This point of distinction involving the elevation of participant to co-artist is a key difference between the pathway/explorer and cocreator classifications. The following examples illustrate the nature of cocreator systems and demonstrates its empowering nature.

The cocreator installation Interactive Plant Growing (1993) by Laurent Mignonneau and Christa Sommerer is composed of five large plants on pedestals arranged at points in a semi-circle around a large 4x3 metre video screen (see illustration 75). This work offers participants a very flexible environment in which to produce an indefinite number of "video-generated gardens." In this way, participants assume creative roles. By touching plants in the installation, viewers activate algorithmically-defined computer calculations which--depending on how the plants are handled--translate into the growth of video-generated vegetation such as ferns, mosses and trees. The installation functions in a manner that allows for the creative potential of each participant to be expressed differently. Mignonneau explains:

> By the approach of a viewer's hand to a real plant, the viewer can regulate, in real time, the process of this virtual growing... the viewer can direct the size of the plant, modify the rotation, can change the colours, or control places for new variations of the same type of plant. All modifications... are directly dependent on the distance between the viewer's hand and the plant.

> Special sensors are attached to the plant roots which measure the human electrical potential through the plant. Since the distance between the hand and the plant get varied by the viewer, different data values are sent to the computer. These data values get converted into digital values and are interpreted by the growing program...
>
> Since it takes some time for the viewer to discover the different levels of modulation, the viewer acts as a randomizing factor for the plants by giving them a very unique character. Due to this, the approach of different people can lead to very different results on the picture. By the real time feedback from the computer, it is possible for the viewer to learn how to change the growing parameters... Five or more people can interact at the same time with five real plants... On the screen, these plants get regrouped into the virtual growing space.[199]

It is evident that this interactive system allows the user a great deal of freedom for determining the type, shape and size of the plants that form within their electronic "paintings".

Don Ritter's "Orpheus" system is also of the cocreator type (see illustration 65 - Nose Against Glass).[200] With the computer program and other electronic apparati in operation, participants feed sound information into the system and affect the "cinematic" qualities of video imagery, for example, editing, fading and colour effects. The open-endedness of the Orpheus system is indicative of a cocreator system. He explains, "[the] piece is really going to be different for the viewer or in my case, it's for the musician that I work with. ... It's not necessarily a finished piece because it will be different depending on the music you send into

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[199] The virtual plants formed by viewer activation intertwine to form dense vegetation on the video screen. Laurent Mignonneau explains how this virtual garden disappears, "To stop the growing process and to clear the full screen, a special fifth plant, a cactus, must be touched. This contact initializes the so-called 'killer plant' which slowly begins to engulf the whole picture by a special algorithm." (Diamond, videocassette. Segment "Interactive Plant Growing - Laurent Mignonneau and Christa Sommerer.")

[200] A further example of a cocreator work is David Rokeby's Very Nervous System (see illustration 63).

it."[201]

Continual Discovery of the Piece - Notion of Game

As in cocreator works like Interactive Plant Growing, the process of the continual and in-depth discovery of electronically complex interactive artwork is quite engaging for viewers. In many pathway/explorer and cocreator installations, the method of interaction with the piece is not explicitly explained; as a result, each individual must "test" the system through experimentation in order to uncover the various hidden layers of the piece. This trial-and-error process of discovery creates an atmosphere of "game" or "play" in works such as Hershman's Lorna, See's A Memory Project, Garvey's Automatic Confession Machine and Jeffrey Shaw' Televirtual Chit Chat (see illustrations 59, 68 and 62 respectively). Shaw discusses the notions of "game" and "play" in Televirtual Chit Chat:

> Televirtual Chit Chat was a *game* of letters and words, playfully constructed and communicated in *Cyberspace*. ... In Televirtual Chit Chat I chose certain strategies that would enable the users to quickly comprehend the underlying operative structure of this *artwork-as-game*. Letters could be chosen from a simulated computer keyboard. The position, size and shape of these letters could then be interactively manipulated over a three dimensional game board whose surface was divided into the familiar grid of 64 squares. ... In Televirtual Chit Chat the two *players* face each other in a televirtual space of alphabetic forms, so that their formal interaction became at the same time a tentative exchange of letters, syllables and words. Each player, while controlling his/her own graphic elements, is at the same time also seeing the result of their partner's actions on their video screen. The result is the real time interaction between the two distant persons that is enacted in visual terms on their respective screens.[202]

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[201] Ritter, interview. In many of the performances using the "Orpheus" program, Ritter collaborates with a musician whose improvised music is the input for his interactive software.

[202] Shaw, 6. (My italics.)

New Nomenclature for the Art Viewer and Artist

Due to the impact of "pathway/explorer" and "cocreator" interactive systems on the art object/art viewer relationship, a re-evaluation of the applicability of the traditional term "art viewer" has become necessary. The term "viewer" underlines the importance of "viewing" or "seeing" in the art appreciation process. However, it is difficult to say in a universal sense, how someone entering an interactive installation should be described, particularly since some installations rely heavily on hearing, moving or touching.

Over the past few decades new terms have been used to describe the changing role of the art viewer. In the 1975 exhibition catalogue of Norman White's electronic sculptures titled Norman White, the two works Gestalte Fish (1974) and State of the Art (1974) (see illustrations 52 and 51 respectively) were termed 'participatory.' Consequently, someone interacting with the work could be labelled as a 'participant.'[203] Myron Krueger also uses the term 'participant' to describe someone who enters his installations.[204] (It is interesting to note that this term carries with it the notion of *intentional* activation of the work, which may not be the case at the onset of interaction.) In her writings, Lynn Hershman also indirectly raises this issue. When discussing her work Lorna (1980-84) (see illustration 59), she often refers to the user with the composite term of "viewer/participant" which makes readers aware of the lack of an adequate singular term.[205] Yet in the following years, "interactive" superseded the term "participatory". In the 1983 Leonardo article "Computer

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[203] White, 18.

[204] Krueger, 147.

[205] Hershman, "Touch-Sensitivity," 432.

Art: Artificial Intelligence and the Arts", Wilson labelled his work "interactive" possibly in an attempt to relay an intellectual property to the installation which is not implied in the term "participatory."[206]

While artists like Stephen Wilson and Nancy Paterson have tended to stick with the traditional term "viewer" to describe humans experiencing their work[207], other artists and writers have used more creative terminology like "player"[208] and "driver".[209] When referring to the work Intersection (1994), Ritter uses the word "visitor" to convey the concept of a temporary association between human and installation.[210] Other artists prefer the term 'user', although Regina Cornwall feels that this term has negative connotations:

> [The term 'user'] may, for some in the art world, ring too much of consumerism, while for others, it seems apt for an art world synonymous with consumerism. ...At times, 'user' seems to describe a process; at other times, it fails, appears awkward, or points up contradictions. The problem is that there is no other term in the young and developing vocabulary of the interactive industry and interactive video as art to describe this significant change in the perceiver's role from passive to active.[211]

The differences in terminology listed above suggest that even artists devoted to the creation

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[206] Wilson, "Computer Art," 15-20.

[207] Stephen Wilson, "Environment-Sensing Artworks and Interactive Events: Exploring Implications of Microcomputer Developments," Leonardo 16, no. 4 (1983): 289, and Nancy Paterson, "The Machine in the Garden," Machine Culture (1993): 150.

[208] "A Very Nervous Piece," Leonardo 23, no. 1 (1990): 137, and Shaw, 6.

[209] Dove, 285.

[210] Don Ritter, *Intersection* - Description and Technical Requirements, text distributed by Don Ritter, Monteral, 1994.

[211] Cornwell, "Interactive Art," 210.

of interactive art have had difficulty collectively formulating a commonly accepted term for those who engage with their work. In my opinion, the term "viewer" seems more applicable to someone who is not participating physically or verbally to any great degree. Those interacting with Henry See's A Memory Project (see illustration 69) by touching a computer keyboard with their fingertips may be adequately described as "viewers" since physical contact with the work is minimal. The term "participant" seems more appropriate to describe someone who must actively move his/her body or make noise, as in the case of David Rokeby's Very Nervous System (see illustration 63).

In the article "Musings on an Interactive Postmodern Metaphor", Fred Truck drew upon a theatrical analogy labelling the "machine as the actor and the user as the audience."[212] By offering this scenario, Truck stresses the importance of *act*-ing--an action that I have drawn from for the formulation of the following terms. I propose that the viewer could acquire the term *interactor* while the artwork acquires the term *interactant*--a term that echoes of the action-inducing power of "stimulant". Both of these terms absolve the importance of any one biological sense for the activation of an interactive work, while also clearly indicating the designation of roles.

In line with the process of redefining the role of the "viewer", has been a redefinition of the role of the "artist." Artists have historically been concerned with challenging traditions and raising questions about media, life, art and philosophy. By doing so, they have attained a privileged position, that of "messenger" whose philosophies are fixed into their art. When

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[212] Fred Truck, "Musings on an Interactive Postmodern Metaphor," High Performance 37 (1987): 50.

Duchamp said, "I believe very strongly in the 'medium' of the artist," he meant that the artist becomes the medium in works of art.[213] Gene Youngblood, a lecturer on the history and theory of experimental video and film at the California Institute of the Arts, believes however that the creation of interactive art necessitates a new kind of artist. He asserts that the creation of artworks that de-emphasize the materiality of the art object depends on the drive of artists to separate the bond between themselves and their work:

> It really pushes up against a question of how far an artist is willing to go in the direction of not being an artist, giving up the ego identification with the product. ...Who in our society is going to do that? The artist as traditionally understood won't do it. So we need a new practitioner, who does what I call 'metadesign.' They create context rather than content. An artist can enter the context they create and make content... To me, this is the new avant-garde: the collaboration of meta-designer and the artist. One not being enough without the other, each needing the other and together constituting a whole new force. ... Those people might be artists whose work would then be given an autonomy of context, which it dearly needs, which the whole modern history of art is screaming for.[214]

Yet, after observing the tremendous amounts of time that electronic artists spend modifying computer programs and connecting electrical cables (described by such artists as Don Ritter[215]), some find it more appropriate to label them as technicians first, and artists second.

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[213] Cabanne, 70.

[214] Durland, 54-55.

[215] Don Ritter, "Interactive Video as a Way of Life," Musicworks 56 (Fall 1993), 54.

# CONCLUSION

The bulk of this thesis has dealt with many issues surrounding the interactive artist's desire to alter the traditional relationship between the art object and viewer. Behind much of the interest of interactive artists in altering the relationship between between the art object and the viewer have been their concerns about the numerous effects of technologies upon society. With the increasing penetration of technologies into contemporary societies, more and more anti-technology views have been emerging. Many people are fearful that the uncritical adoption of technologies contribute to unhealthy social relations. Through their work and correspondences, electronic artists like Nam June Paik have been directly and indirectly referring to the effects of technologies on culture for years. Telecommunications artist Roy Ascott explains his concern about the possible effects of technological misuse: "There is no doubt that telematic networks and computer systems, used merely as tools of production, will certainly and very effectively promote sterility and alienation in the culture...".[216] David Rokeby also admits that technologies placed in the hands of "those who are bored and are looking for escape" can be used destructively.[217]

Arts writer Mary Gooderham agrees about the possible effects that media technologies may have upon the public: "the practice of people literally burying their head in computers could

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[216] Ascott, 7.

[217] David Todd, "Art for Technology's Sake," The Bulletin, 13 December 1993, 9.

make them more machine-like and anti-social, rather than the medium being an active communications tool shared by users."[218] In accord, Jerry Mander suggests in his book Four Reasons for the Elimination of Television, that television should be completely abolished from society because of its inherent capacity to corrupt:

> Television seems to be addictive. Because of the way the visual signal is processed in the mind, it inhibits cognitive processes. Television qualifies more as an instrument of brain-washing, sleep induction and/or hypnosis than anything that stimulates conscious learning processes. Television is a form of sense deprivation, causing disorientation and confusion. ...Television supresses and replaces creative human imagery.[219]

Some electronic artists share Mander's concern for the debilitating effects of certain technologies. Kit Galloway and Sherrie Rabinowitz reacted against the numbing way that television is experienced and objected to "the way it's taken in, this wash of images with nobody really remembering the context of any particular image."[220] Stephen Wilson admits that he created the artworks outlined in the 1983 article "Environment-Sensing Artworks and Interactive Events" to present a dialogue around the potential effects of communication technologies. He writes, "I approach my art in this spirit, using technology to explore its implications. I am moved by the possibilities, opportunities, and dangers created by computer developments. I create art using these potentialities to ask questions about them."[221]

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[218] Mary Gooderham, "Alice in Cyberspace" Globe & Mail, 8 January 1991.

[219] Jerry Mander, Four Arguments for the Elimination of Television (New York: Quill Publishing, 1978), 348. It is difficult to tell if Mander's book has been succesful at convincing people to tune out or tune off. But Globe and Mail columnist Morris Wolfe reports that an increasing number of people, even the Godfather of Cyberspace, William Gibson, have stopped watching television and feel more healthy as a result. (Morris Wolfe, "Frozen Corpses and Other Essential Info," The Globe and Mail, 21 December 1993, C5.)

[220] Durland, 53.

[221] Wilson, "Environment-Sensing Artworks" 288.

Lynn Hershman also creates art to raise questions about the ramifications of technologies. Her interactive work stems from her concern about the controlling power that television has upon viewers. She explains that the integration and perpetuation of television negates individual power:

> Television literally puts its viewers into an altered state. The 60 decibel hum emitted from the set causes the brain to relax into an alpha mode which is a passive and non-responsive behaviour. ..Because direct response is discouraged and repressed, the television audience harbours subliminal feelings of impotence..[222]

Hershman also finds that many multi-media interactive systems, such as virtual reality systems and the Internet, alter viewer existence:

> Perhaps the most subversive element of new technologies is their ability to force 'real life' to transgress space and enter artificially based environments. Thereby they diabolically transfigure the essence and authenticity of the participant, who not only becomes artificial through the process, but who can be recognized only when electronically disguised.[223]

This concern for the destructive potential of technologies has led Hershman to use these media for artistic purposes rather than commercial ones. Her motivation is to alter the standard utilization of these media through her software branching system (discussed in depth in Chapter 4) in a way that favours her audience:

> As the branching path is deconstructed, players can become aware of the subtle yet powerful effects of fear caused by the media, and my hope is that they become more empowered (active) through this perception. ..Such artistic acts interrupt the flow of the media bath of transmitted, prestructured

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[222] Hershman, "Bodyheat," 45. Is not this "passifying" effect still present when television is used in interactive art? Is it effectively combatted when a viewer pushes a button as part of an interactive cycle?

[223] Hershman, "Touch-Sensitivity," 433.

> and edited information in which our society is submerged. ...it encourages participation and, therefore, creates a more empowering audience dynamic.[224]

Many electronic artists report that their artwork helps to elucidate the potentially harmful effects of technologies by attempting to shift the standard control relationships between electronic media and viewers. As a result of their concerns, these artists may be attempting to, as Mary Gooderhman writes, "recreate reality in some kind of artistic form in order to get control over it, to understand it."[225] Gooderham admits, however, that this attempt to control technologies is an integral human instinct, going back over 20,000 years.

Don Ritter openly asserts that one of his primary motivations has been to alter the dominating nature of television. When questioned about his interactive performance Media Play: Given the Trombone and Television (1989), Ritter answered:

> Why do I do what I do? ... The reason is that electronic media or television in general is an incredibly powerful medium and it's not really being used for fine art purposes or cultural purposes. It is only being used to encourage consumption through the use of advertising. Television programs are packaging for advertising and they have become so successful at it that most people don't even realize that. One reason why I did that performance [Media Play] is to say, maybe television can be used for something else but, I'm not even going to use videotape, I'm going to use television itself. ... I've taken television, live television, and slightly transformed it. ... That's my motivation. To end all of this is to say 'this medium has incredible potential. I'm going to explore it.'[226]

Other interactive artists are even more direct in their attempts to raise questions about the

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[224] Hershman, "Touch-Sensitivity," 434.

[225] Gooderham, "Alice in Cyberspace."

[226] Ritter, interview.

effects of media technologies. In Je Suis (un Readymade), one of Benjamin Jay Britton's video sequences ask questions to viewers such as "Do you control the media in your life?" and "Does mass media create your identity?" These questions project the viewer into a reflective analysis of the effects of mass communication technologies on their lives (see illustration 17).

Over the last few years, concerns about the effects of technologies have escalated, particularly with the development of Virtual Reality technologies (VR). Although the nature of these technologies differ, many VR systems attempt to place individuals literally within technological apparati such as "head mounted displays" and "data gloves" so that they feel as though they have been transposed into an artificial world. Jaron Lanier, founder of an American VR company and father of the term 'virtual reality', continues to attempt to subdue fears of the potentially negative effects of VR. He claims that those who imagine that people will become misguided in VR worlds are themselves dreaming. He asserts that VR will never replace the real world because the physical world is infinitely more subtle and intricate than those generated by VR technologies.[227] Lanier's view is certainly lacking the alarm felt by many electronic artists and theorists. But capitalist rewards gained as Lanier spurs on the advancement of VR technologies may be the underlying motivation for his fearless attitude and hence, artists' warnings go unheeded by many.

Toronto-based virtual reality artist Graham Smith agrees that virtual reality technologies, just

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[227] Doug Stewart, "Through the Looking Glass into an Artificial World - Via Computer," Smithsonian (1990): 45.

like any other media technology, may have a negative impact on society.[228] Consequently, Graham Smith--in collaboration with the McLuhan Program for Culture and Technology at the University of Toronto--has developed VRAAP, the Virtual Reality Artists Access Program, which attempts, according to its mandate, to increase the accessibility of virtual reality-based technologies to artists.[229] This mandate responds to the belief that these technologies should be in the hands of artists, not business executives who are looking to make money and who are without concern for their social and psychological effects. As Marshall McLuhan wrote in Understanding Media - The Extensions of Man, "The media are not toys; they should not be in the hands of Mother Goose and Peter Pan executives. They can be entrusted to new artists, because they are art forms."[230] Hence, VRAAP is an organized attempt, according to Smith, to nudge the progress of these technologies towards the "right" direction,[231] whatever that direction might be.

* * * * *

Clearly, one of the key interests of the interactive artists of the 1980s and 1990s has been to explore the boundaries of technologies in art. Yet, some may question whether or not many of these artists have gone too far, for one of the most difficult and unaddressed issues in need of resolution within the field of electronically interactive art does not relate to any of

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[228] Todd, 9.

[229] Since its founding in 1993, the VRAAP program has supported projects for approximately 20 artists (one project involved twelve artists).

[230] VRAAP, Text distributed by the McLuhan Program for Culture and Technology, University of Toronto, 39A Queen's Park Ave., Toronto, 1995.

[231] Todd, 9.

the concerns mentioned above. Instead, it has to do with one of the primary proclamations asserted by the artists themselves, namely, that "the software is the art". Although this research project has made a significant attempt at exploring this ideology, a question remains unanswered as to whether or not this perspective also serves to keep art critics at bay, for how many of us are capable of analyzing "art software"? When considered along with their drives to include audiences into their work, does not this assertion promote the opposite? In other words, if "the software is the art", and viewers in art galleries are activating interactive sculptures that house this art, can viewers ever achieve a direct experience of art appreciation? Consequently, one might ask: despite its declarations and motivations for including viewers, is interactive art actually a step away from the "Democratic Art" that Frank Popper conjured up in 1975? Furthermore, considering the diversity of technological knowledge held by those technologically-initiated and well-learned, one might ask how the role of the art historian will change in order to scrutinize the technological developments of the future.

Illustration 1: Drawing the Line, April 5-22, 1989, poster for an "interactive" lesbian photo exhibit exploring the issues of censorhip and sex at A Space, Toronto, by artists Lizard Jones, Persimmon Blackridge and Susan Stewart.

Viewers were encouraged to draw lines on erotic photographs to signify their boundaries between art and pornography.

**Thursday April 19, 7:30pm**
**LOCATION: Beaver Hall**
**29 McCaul** (just north of Queen)

A workshop with Vancouver artist Lizard Jones, one of the co-producers of the lesbian erotic photo show, "Drawing the Line." Lizard will facilitate an informal discussion of the practicalities, ethics, pitfalls and joys of producing sexually explicit lesbian art work. Of interest to women who like to make it, watch it, or do it. For more information call A Space at: 364-3227

Presented in conjunction with
**drawing the line**
an interactive lesbian photo exhibit
exploring issues of censorship & sex
Susan Stewart
Persimmon Blackbridge
Lizard Jones
at BEAVER HALL
April 5 to April22

A space

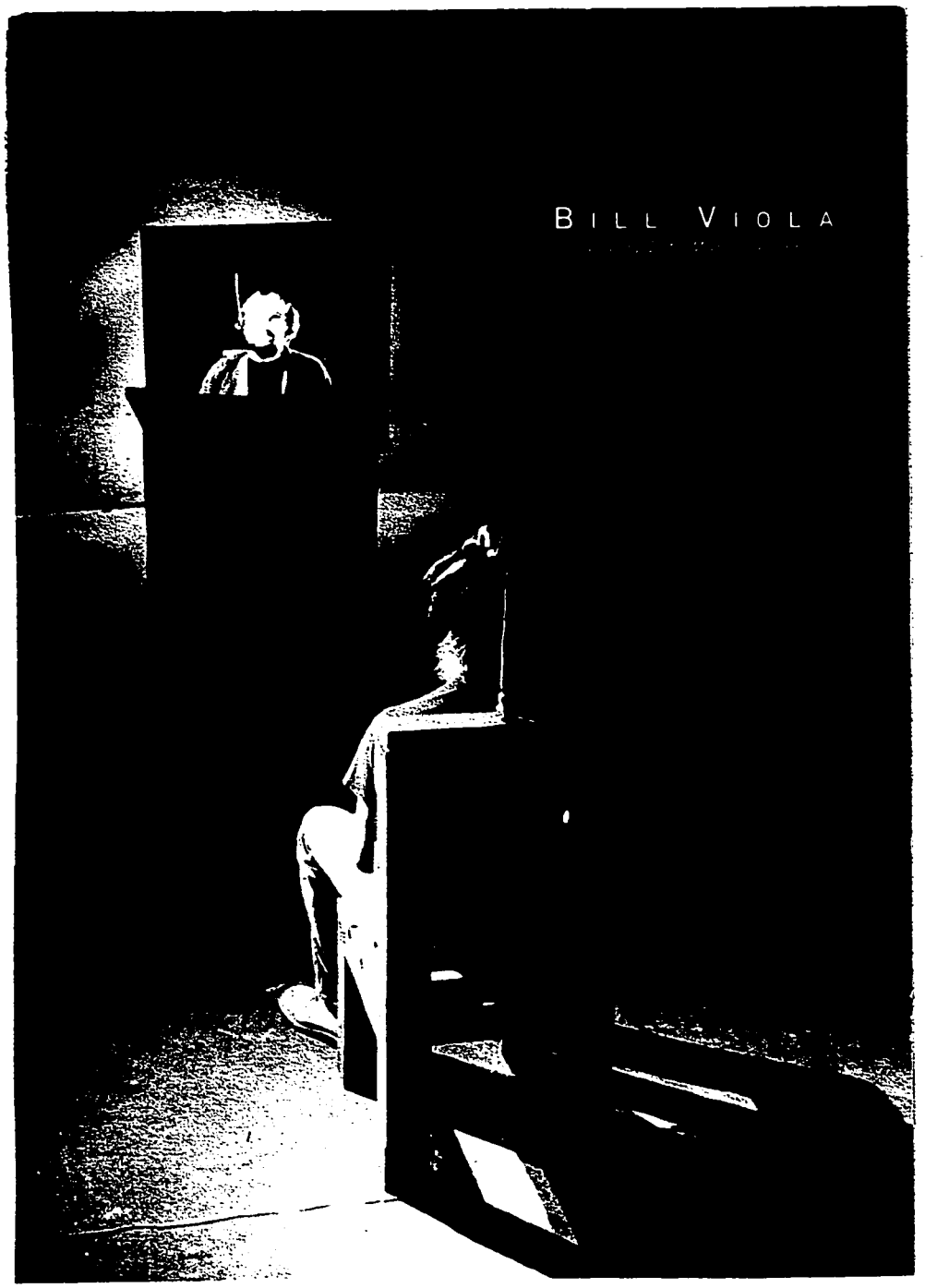
Illustration 2: Self Portrait (1988), Juan Geuer.[232]

This sculptural work was part of a 1989 exhibition in Oakville, Ontario, titled "Interactive Works." Its placement in this exhibition illustrates the state of confusion surrounding the term "interactive" since this work does *not* respond to the viewer; it is an inert sculpture. According to the definition used in this text, a repositioning of one's body to view of a work of art does not constitute "interaction".

[232] Source of illustration: Barrett, 2. For the remainder of this text, footnotes will be devoted to revealing the sources of the illustrations.

Illustration 3: Reasons for Knocking at an Empty House (1982), Bill Viola.[233]

Despite an inclusion of the viewer's body into this work, it is *not* considered an "interactive" piece.




[233] Bill Viola - January 21 to March 14, 1993 (Montreal: The Museum of Contemporary Art, Montreal, 1993), 1. Pamphlet.

Illustrations 4a and 4b: Two video stills from the The Erl King (1986), interactive videodisc installation, by Grahame Weinbren and Roberta Friedman.[234] Viewers are able to control the unfolding of a story through a computer keypad.

a

b

[234] Cornwell, "Interactive Storytelling," 43, 45.

Illustration 5: Artist and Model (unfinished engraving) (1639), Rembrandt.[235]

This work exemplifies the concept of *non-finito*.

[235] Robert, 12.

Illustration 6: Violin and Palette (1909-1910), oil on canvas, 36 1/4 x 16 7/8" by Georges Braque. Collection: The Solomon Guggenheim Museum, New York.[236]

[236] H. H. Arnason, History of Modern Art 3rd ed. (New York: Harry N. Abrams, 1986), 155.

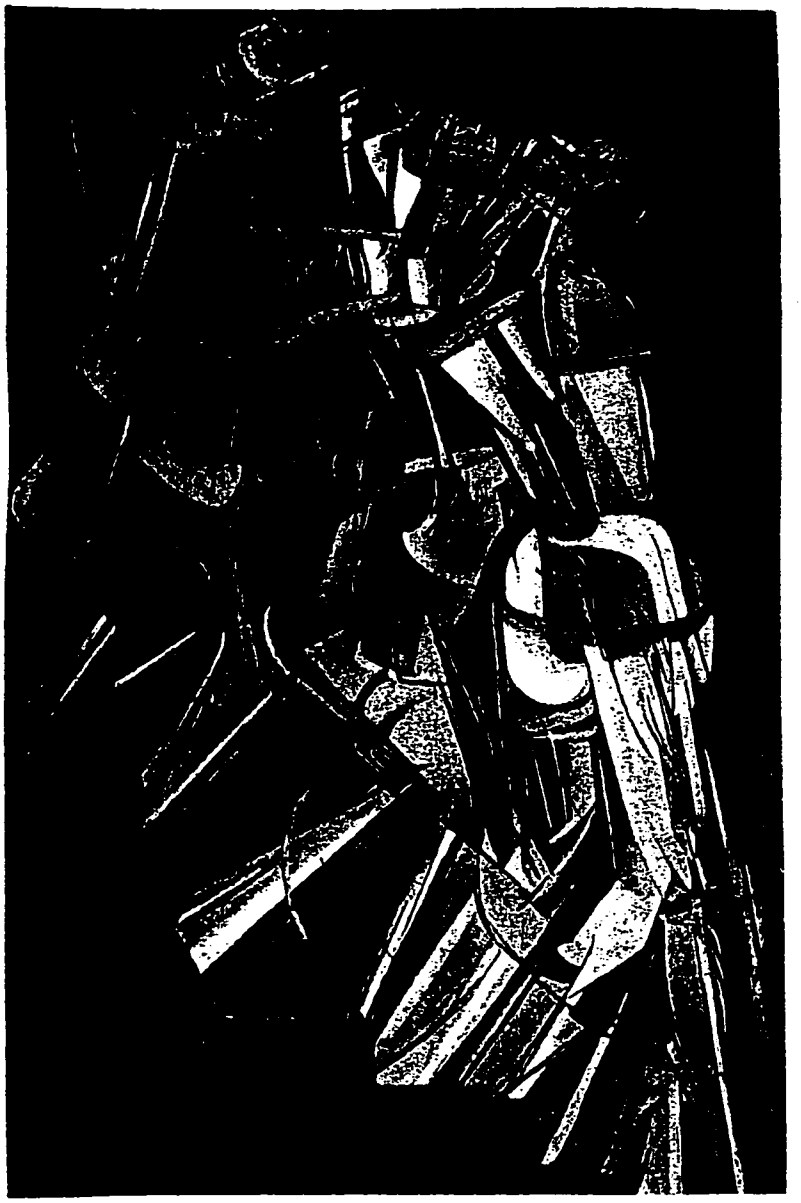
Illustration 7: Flight of the Swifts (1913), Giacomo Balla, watercolour on paper, 22 x 33". Collection: Mr. and Mrs. Joseph Slifka, New York.[237]

[237] Arnason, 195.

Illustration 8: Dynamism of a Dog on a Leash (Leash in Motion) (1912), Giacomo Balla, 35 x 45.5". Collection: George F. Goodyear and the Buffalo Fine Arts Academy, New York.[238]

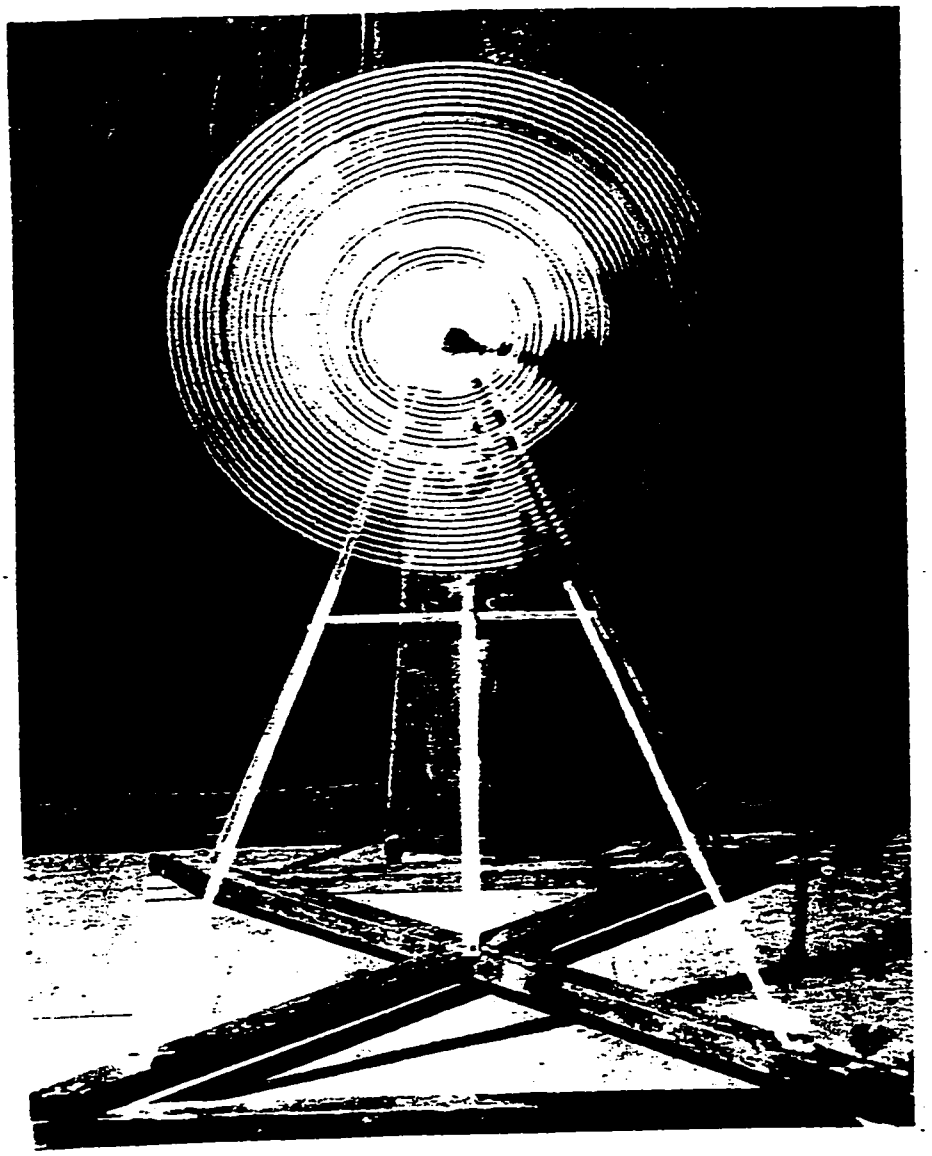
[238] Arnason, 182.

Illustration 9: Nude Descending a Staircase No. 2 (1912), oil on canvas, by Marcel Duchamp, 58 x 35". Collection: Philadelphia Museum of Art, Louise and Walter Arensberg.[239]



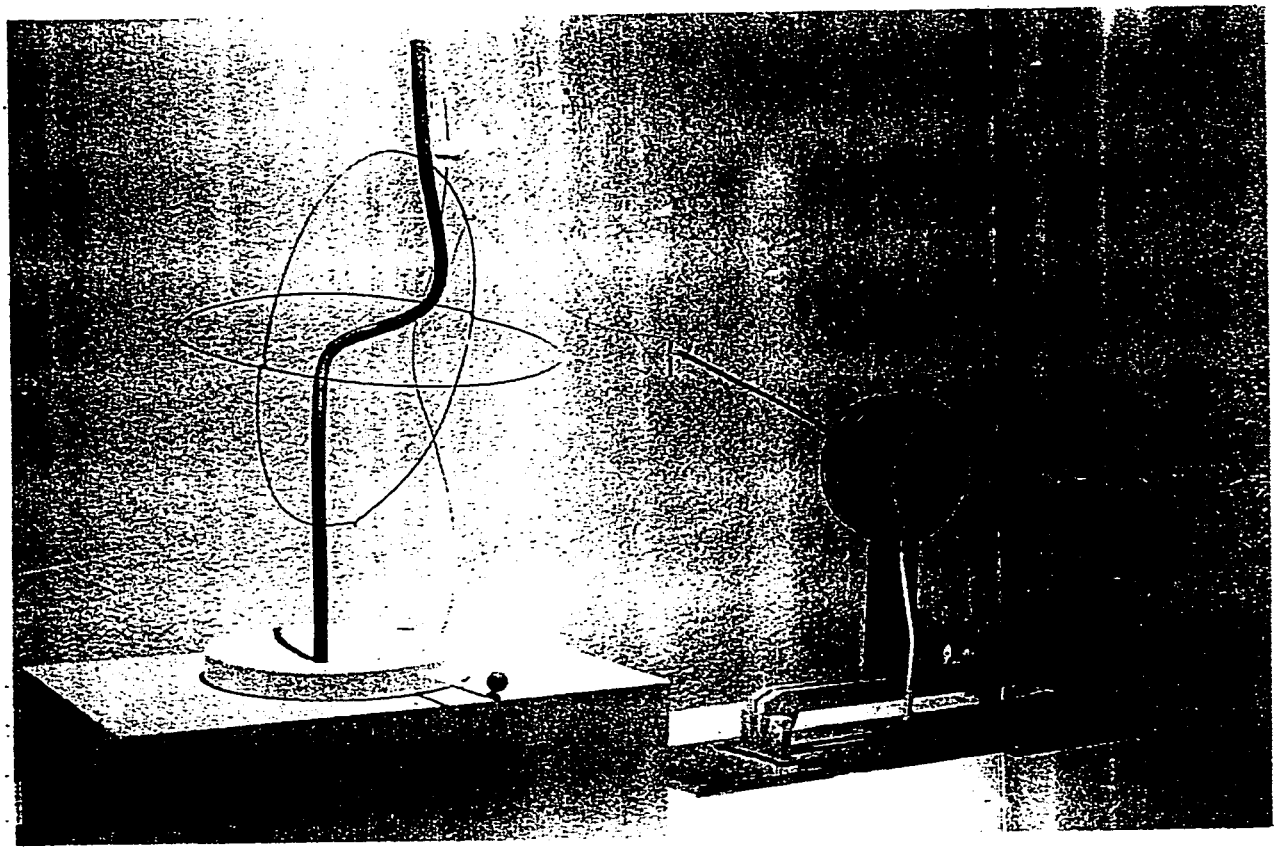
[239] Arnason, 193.

Illustration 10: Rotative Plaques (1920), glass, metal and wood, 73 x 48 x 40", by Marcel Duchamp. Collection: Yale University Art Gallery, New Haven.[240]



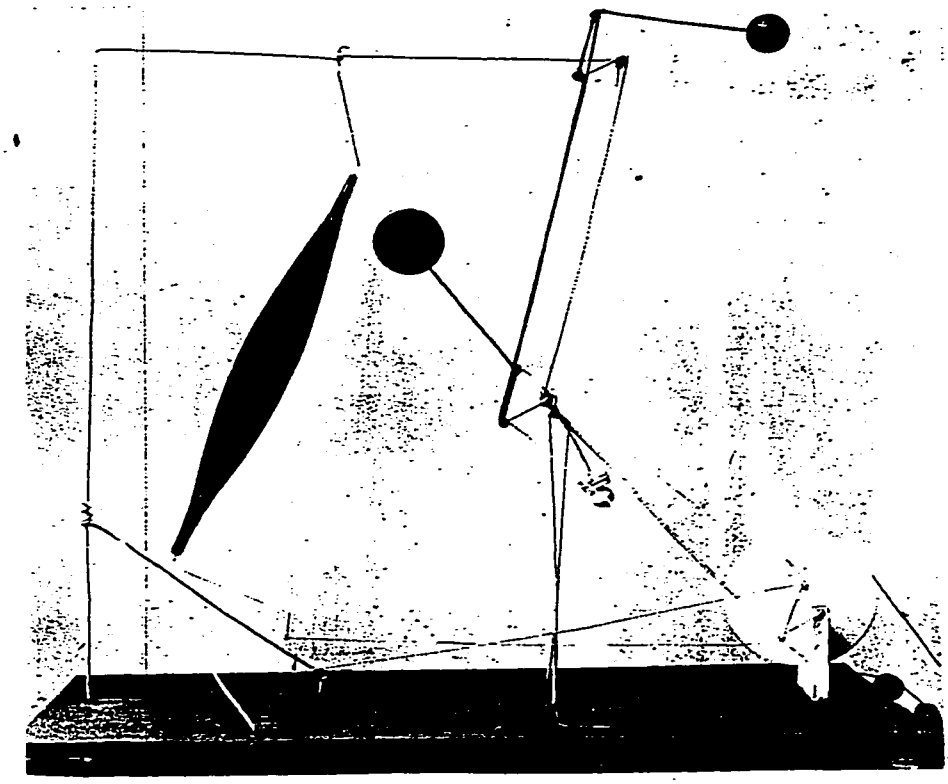
[240] Arnason, 228.

Illustration 11: A Universe, mobile with motorized mechanism shown to the right (1934), 40.5" in height, painted iron pipe, wire, and wood with string, by Alexander Calder. Collection: The Museum of Modern Art, New York.[241]



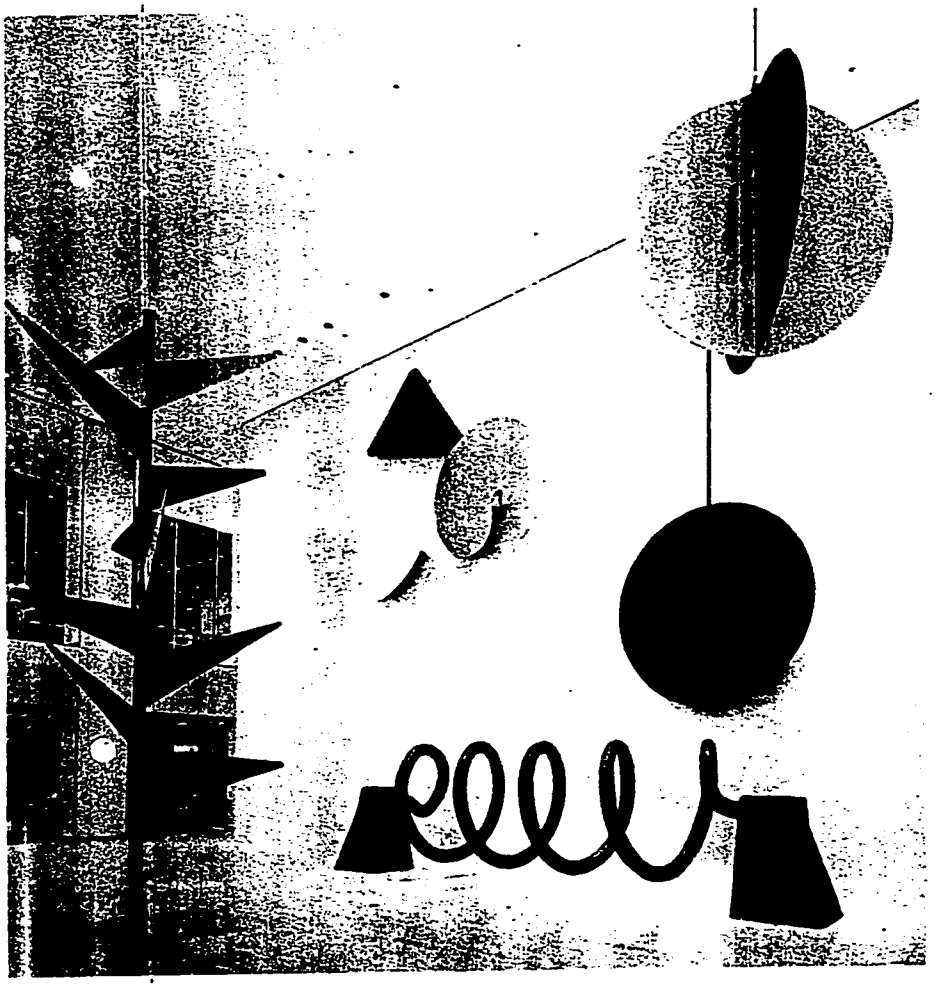
[241] Joan M. Marter, Alexander Calder (New York: Cambridge University Press, 1991), 147.

Illustrations 12: The Motorized Mobile That Duchamp Liked (1932), motor driven mobile by Alexander Calder. This work would later be modified into The Bicycle (1968) which was inspired by Marcel Duchamp's Bicycle Wheel of 1913.[242]



[242] Alexander Calder, Calder: An Autobiography With Pictures (New York: Pantheon Books, 1966), 127.

Illustration 13: Universe (1974), several kinetic sculptures by Alexander Calder (situated in the Sears Tower Lobby).[243]

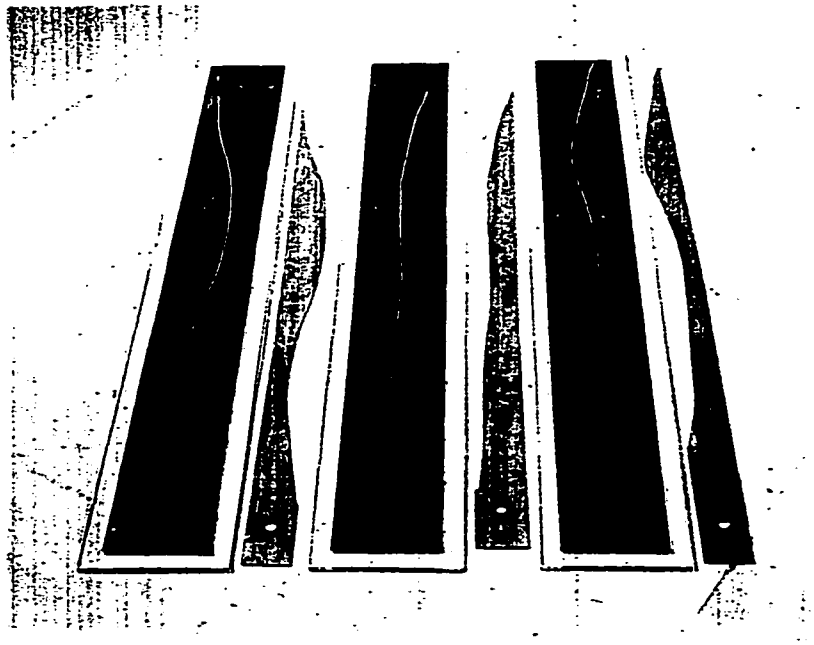


[243] Albert E. Elsen, Alexander Calder - A Retrospective Exhibition (Chicago: Museum of Contemporary Art, 1974), 25.

Illustration 14: Three Standard Stoppages (1913-14), 3 stoppages 49 5/8 x 7 1/8", 3 yardsticks 44 1/8", the whole enclosed in a croquet case, by Marcel Duchamp.[244]

Duchamp created this work by dropping three yard-long pieces of string; he made cut-outs of the patterns that where randonly created from the path of the strings.

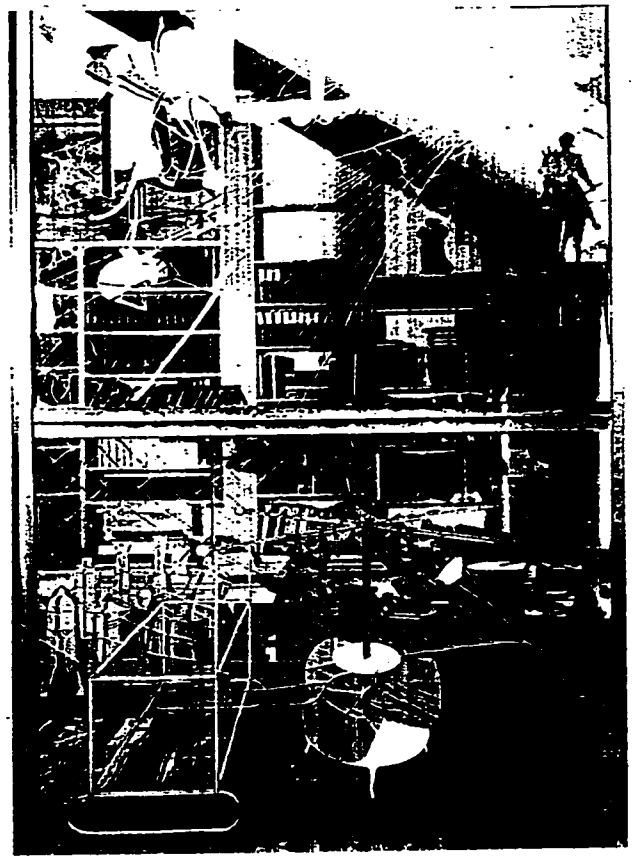
The element of unpredictability incorporated into the composition of this work, has become an important ingredient in many of the electronically interactive pieces in the late twentieth century.



[244] Arman, 33.

Illustration 15: The Large Glass (1915-1923), 109 1/4 x 69 1/4", Marcel Duchamp. Collection: Philadelphia Museum of Art.[245] (Behind the work is the library of Katherine S. Dreier, Redding, Connecticut.)

In the upper hand corner of The Large Glass, one can see tiny holes that have been drilled into the glass. The positioning of these holes was determined through a random, unpredictable process; Duchamp fired a toy gun from across the room at The Large Glass--where the pellets hit the work, Duchamp drilled holes.



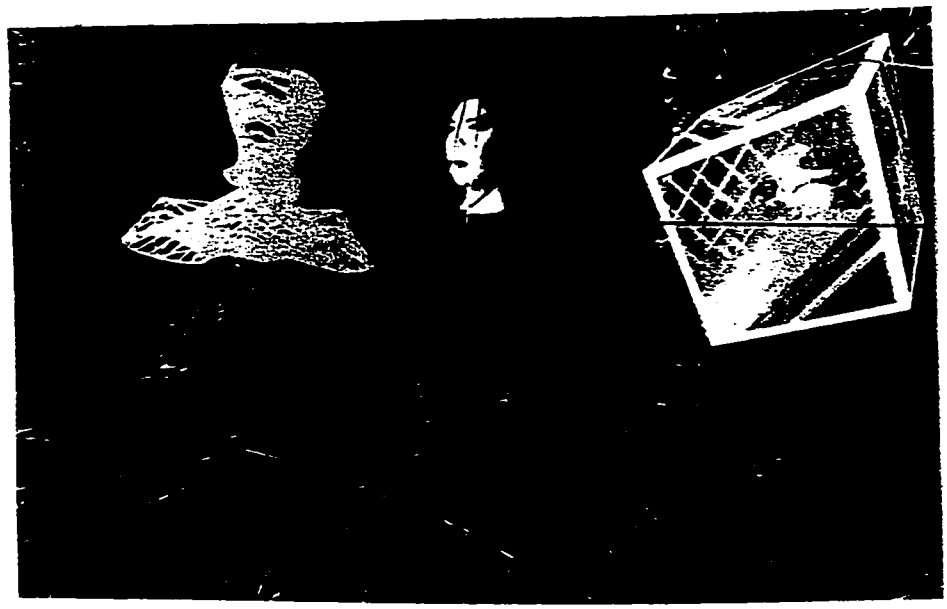
[245] Arman, 64-65.

Illustrations 16a and 16b: Archaeology of a Mother Tongue (1993), virtual reality installation, detail of interactive computer graphics, by Toni Dove and Michael Mackenzie. Produced at the Banff Centre for the Arts, Alberta, Canada.

16a: As the user "touches" each object [using virtual reality technologies], it grows and the user enters it.

16b: Animated figures guide the user down paths of various narratives and sounds.[246]

a



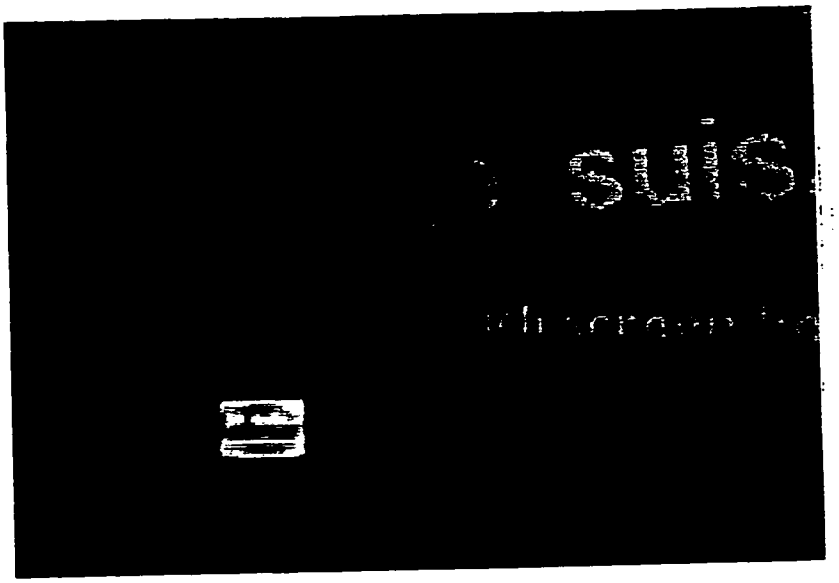
b

[246] Dove, 284, 285.

Illustrations 17a and 17b (of 17a to 17d): Je Suis (un readymade) (circa 1991-1992), touch screen interactive computer and video installation, Benjamin Jay Britton.[247]

Illustrations 17a and 17b show the viewer seated in front of a computer monitor whose image is projected onto the wall ahead. The opening screen introduces Je Suis and invites the viewer to explore the work by touching the monitor.

a



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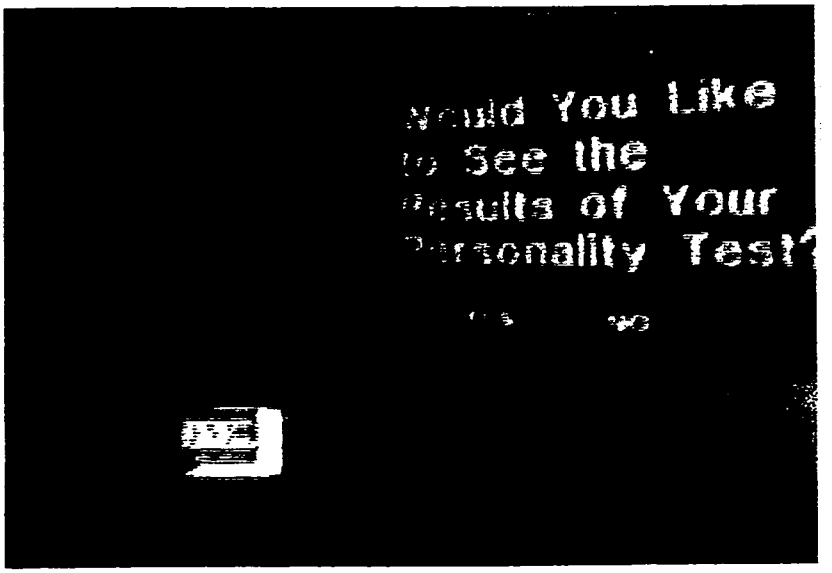
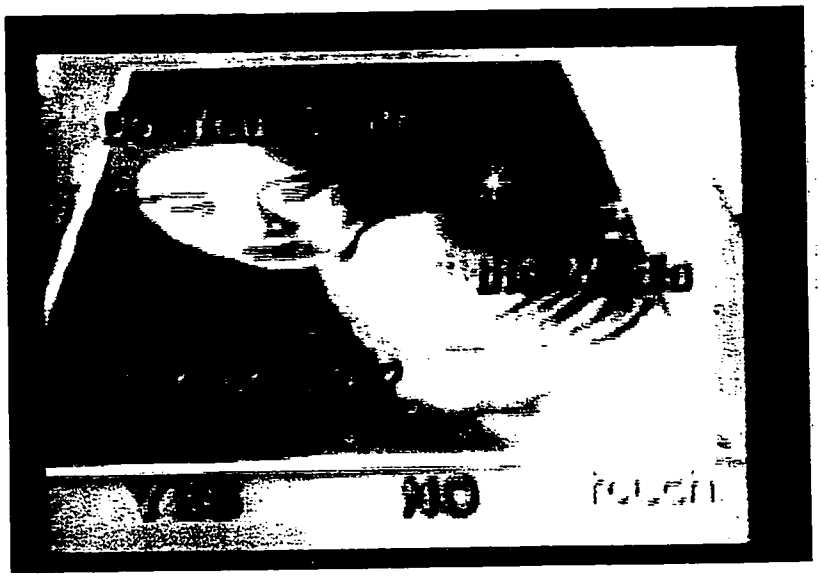



[247] Diamond, videocassette. Segment "Je Suis (un readymade) - Benjamin Jay Britton."

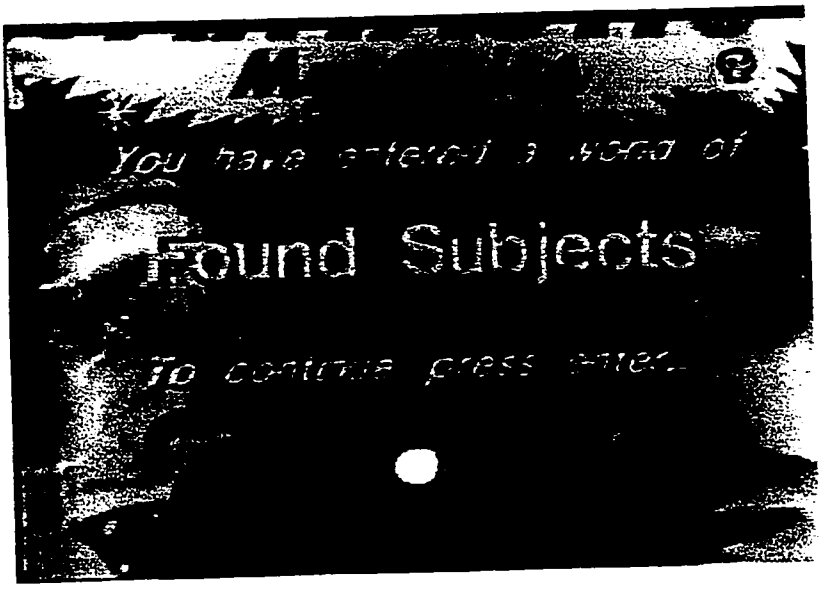
Illustrations 17c and 17d (of 17a to 17d): Je Suis (un readymade) (circa 1991-1992), touch screen interactive computer and video installation, Benjamin Jay Britton.[248]

Interacting with the work triggers the presentation of questions and imagery exemplified in the illustrations below.

c




d




[248] Diamond, videocassette. Segment "Je Suis (un readymade) - Benjamin Jay Britton."

Illustration 18: Desire Inc. (1989), interactive videodisc installation, Lynn Hershman.

This video still depicts a character who knocks on the screen of the video monitor, inviting the viewer to participate.[249]


[249] Jean Gagnon, Lynn Hershman: Virtually Yours 4 May to 3 July 1995 (Ottawa: National Gallery of Canada, 1995), 14.

Illustrations 19a and 19b: The Machine in the Garden (1993), interactive computer/video installation, Nancy Paterson.[250]

19a: Viewers approach a slot machine and three video monitors. Images on the monitors form one of nine configurations of the "See No Evil, Hear No Evil, Speak No Evil" Buddhist proverb. Viewers are invited to pull the handle of the slot machine to initiate the piece.

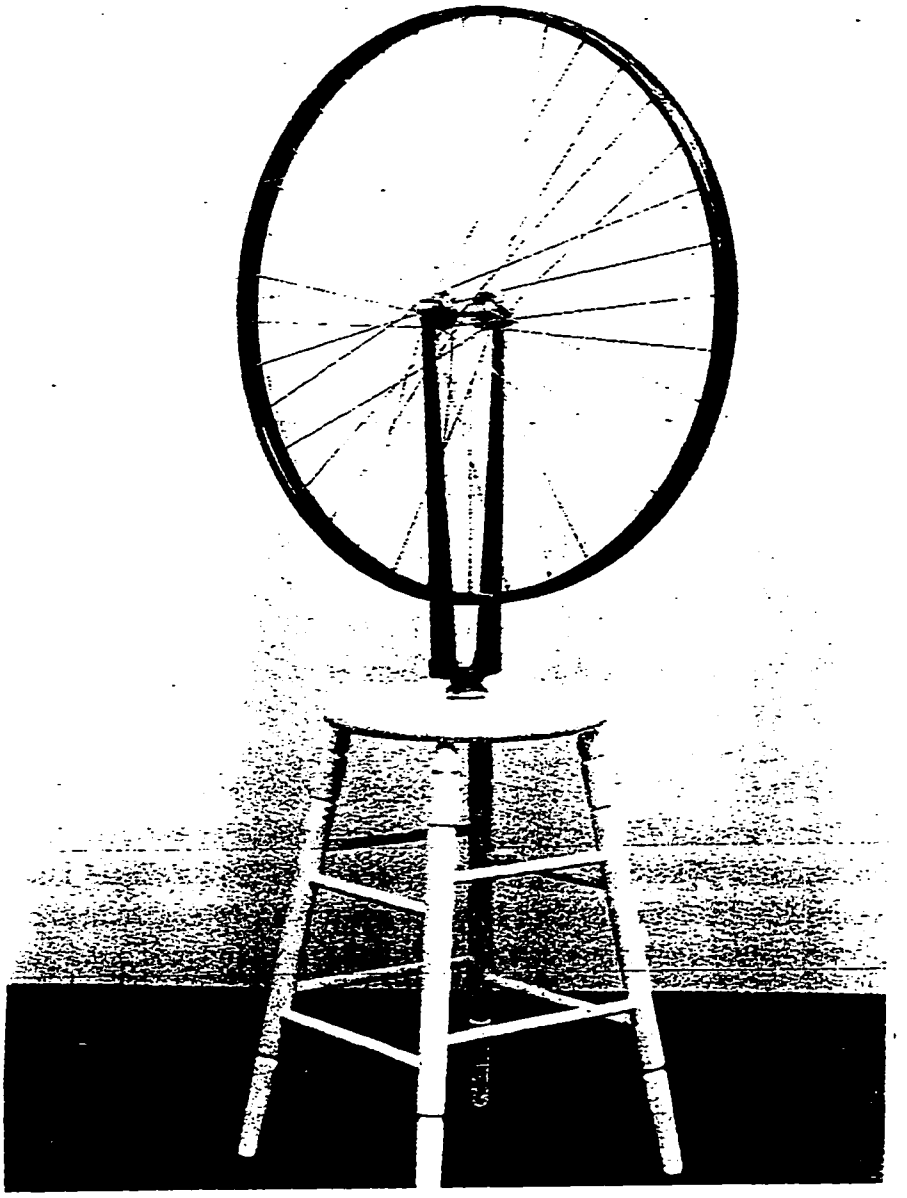
19b: Once the handle is pulled, video clips scroll by revealling themes of war, television evangelists, game shows and childrens programs. The resting stage of the work returns as the Buddhist composite appears on each monitor, one by one.

a

b

[250] Paterson, "The Machine in the Garden," Interactive Installations. Distributed by Nancy Paterson, 1995, videocassette.

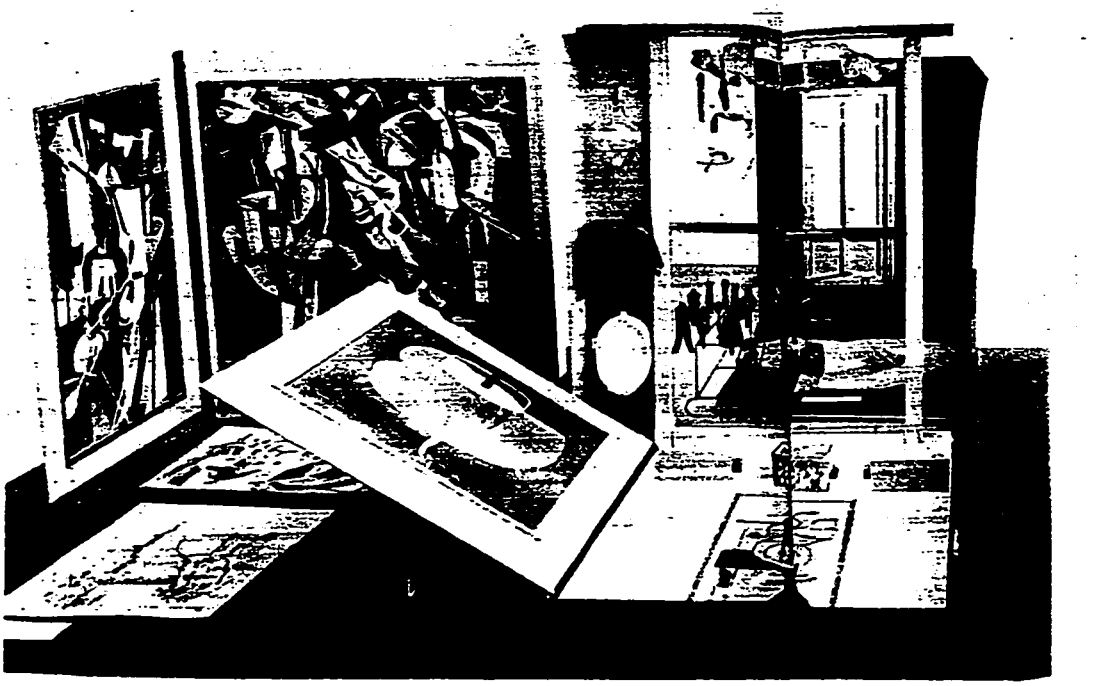
Illustration 20: Bicycle Wheel (1951: third version after lost original of 1913), Marcel Duchamp, assemblage, metal wheel, 25.5" diameter, mounted on painted wood stool, 23 3/4" high, overall 50.5" high. Collection: Museum of Modern Art, New York, the Sidney and Harriet Janis Collection.[251]



[251] Arnason, 228.

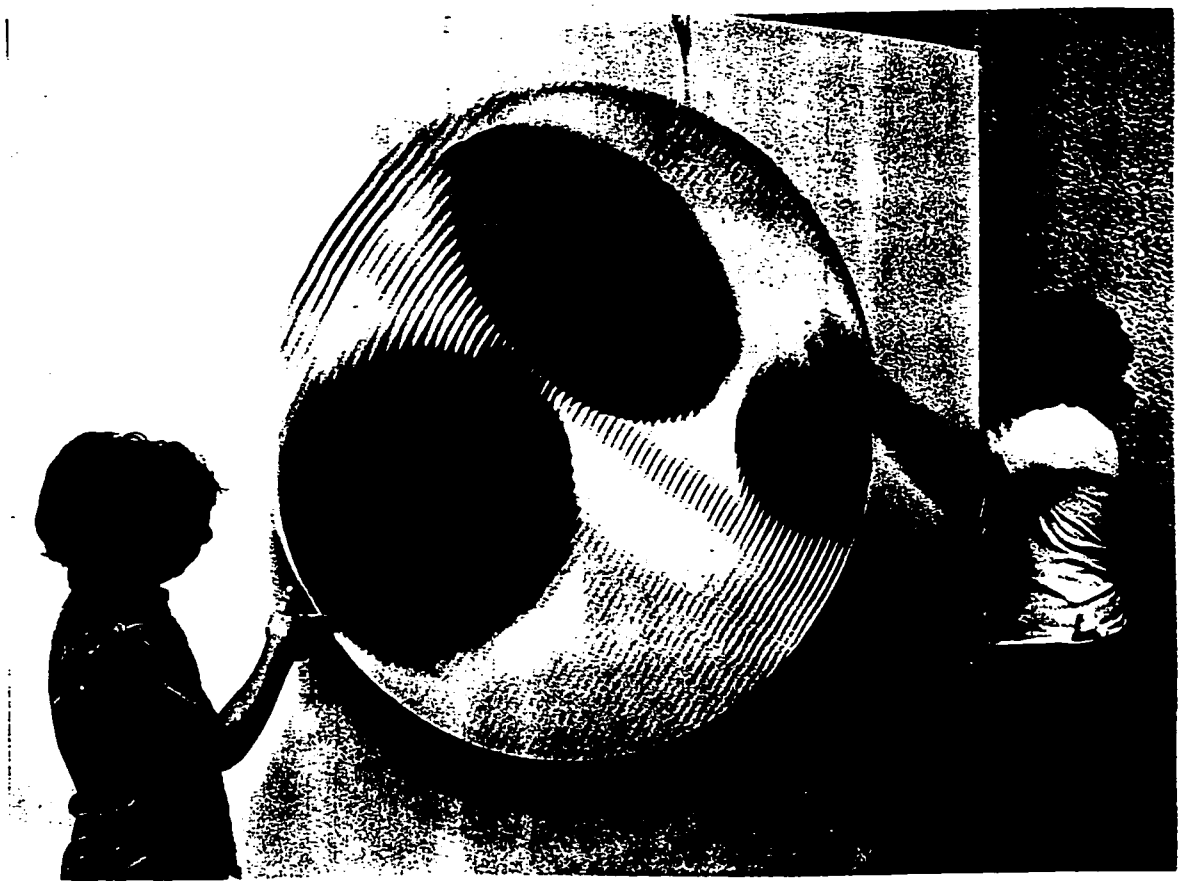
Illustration 21: Detail of The Box in a Valise (1941), 16 1/8 x 14 7/8 x 4 1/8", Marcel Duchamp.[252]

Containing miniatures of many of Duchamp's previous works, Valise necessitated that it be physically manipulated (opened) in order for viewers to examine the pieces inside; today, the act of touching is implied by a reference to a "suit-case" or "portfolio" format.



[252] Arman, 96-97.

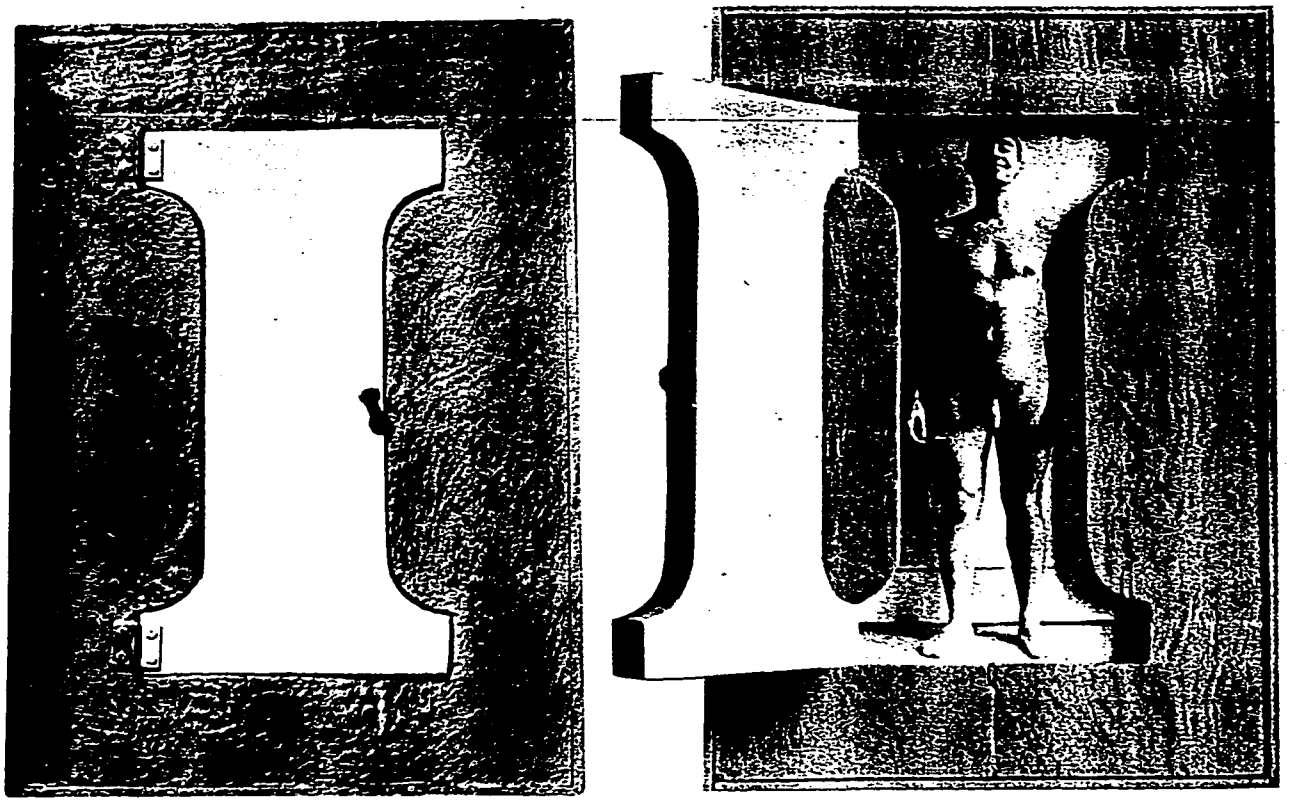
Illustration 22: Metamorphosis (1957), Yaacov Agam. Viewers spin the work and create an optical illusion.[253]



[253] Popper, 6.

Illustration 23: I-Box (1963), mixed media sculpture by Robert Morris. Collection: Hanford Yang.[254]

This sculpture requires the viewer's physical contact and therefore draws upon the notion of touch indicated in works like Duchamp's Valise.

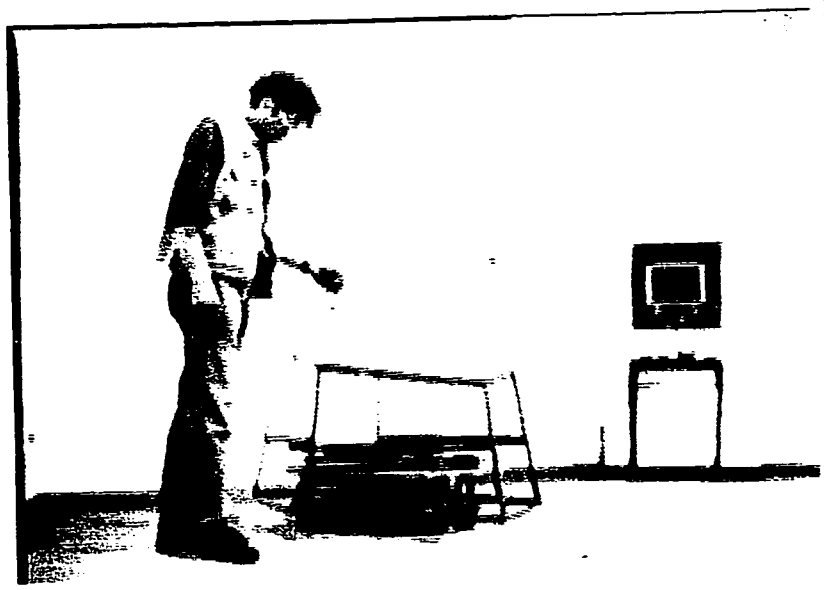


[254] Wayne Andersen, American Sculpture in Process: 1930/1970 (Boston: New York Graphic Society, 1975), 211.

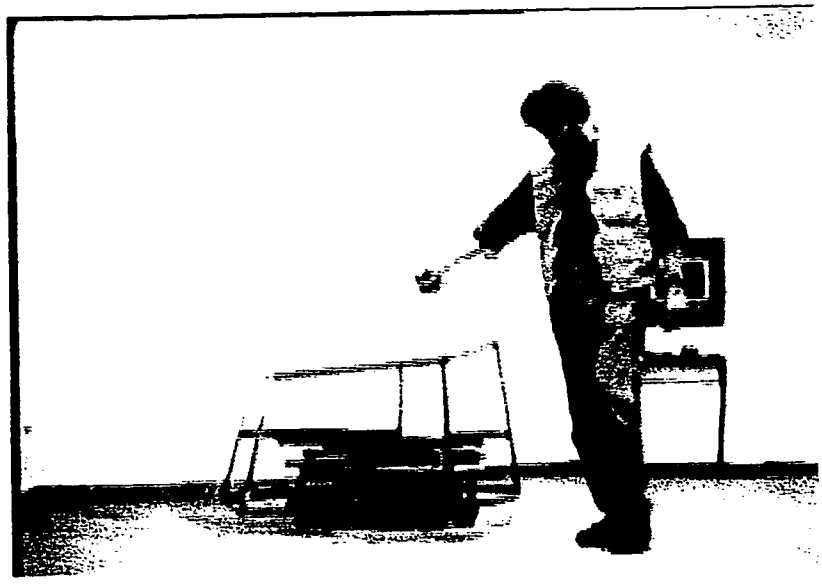
Illustrations 24a and 24b: Helpless Robot (1989-1993), interactive sculpture, Norman White.[255]

24a and 24b: As the sculpture detects the presence of people in the area, it politely asks them to rotate it left and right; the more the viewer appeases the sculpture's wishes, the more demanding and hostile it becomes.

a



b



[255] Norman White, Helpless Robot, distributed by Norman White, 1995, videocassette.

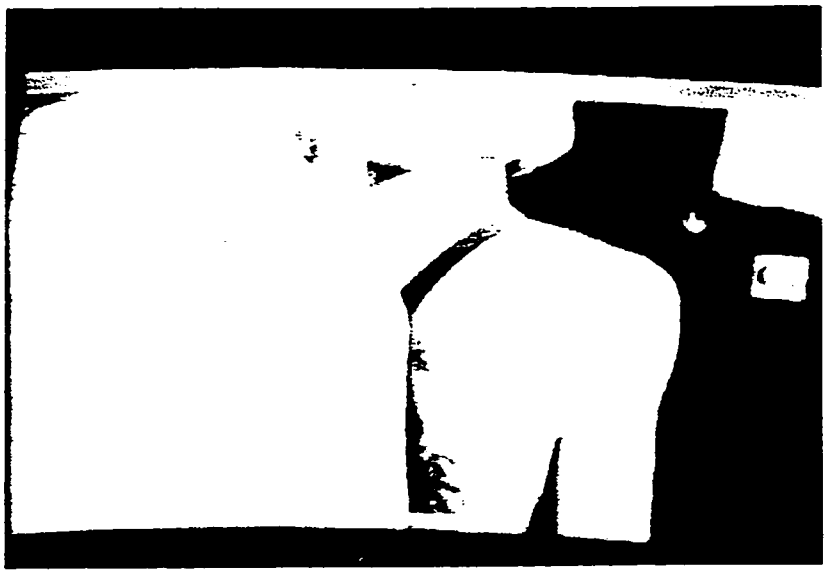
Illustrations 25a and 25b (of 25a to 25f): Deep Contact (1986-1989), interactive videodisc installation, Lynn Hershman and Sara Roberts.

25a: This video still shows a character--Marion--seemingly knocking from within the video monitor and inviting the viewer to touch the video screen and initate the exploration of the interactive piece.

25b: This video still shows three characters, each of which can be explored by touching A, B, or C.[256]

a

b

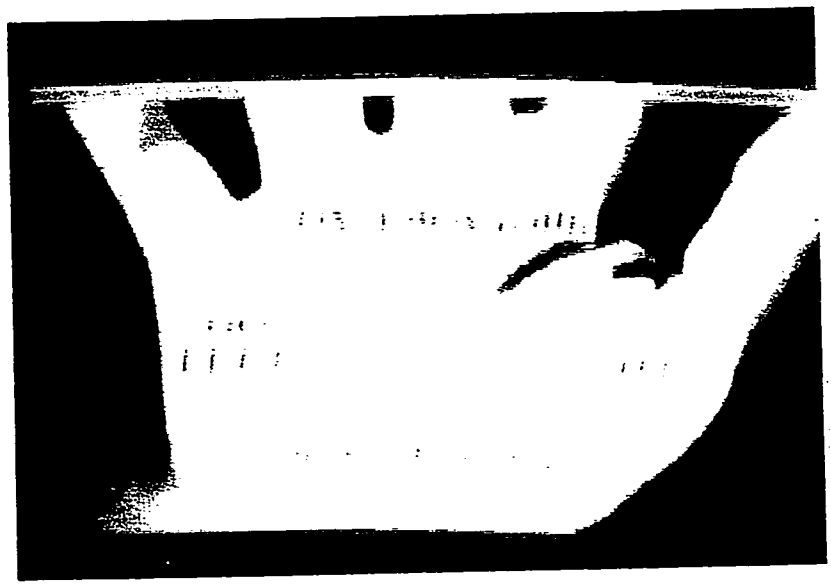


[256] Diamond, videocassette. Segment "Deep Contact - Lynn Hershman and Sara Roberts."

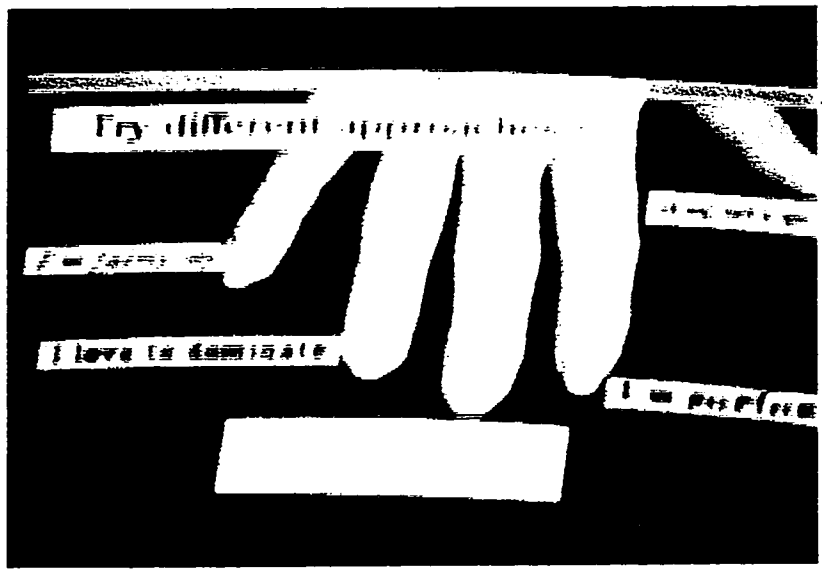
Illustrations 25c and 25d (of 25a to 25f): Deep Contact.

25c and 25d: These video stills show options available to the viewer.[257]

c



d



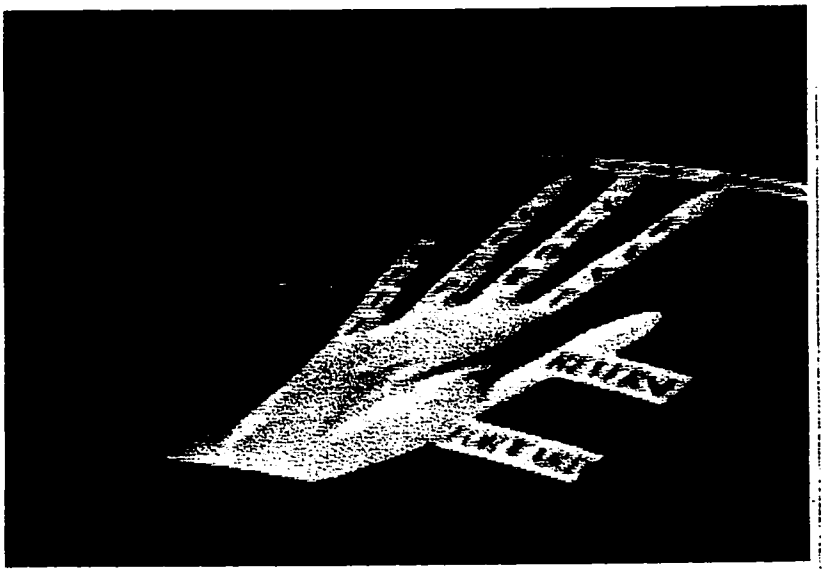
[257] Diamond, videocassette. Segment "Deep Contact - Lynn Hershman and Sara Roberts."

Illustrations 25e and 25f (of 25a to 25f): Deep Contact.

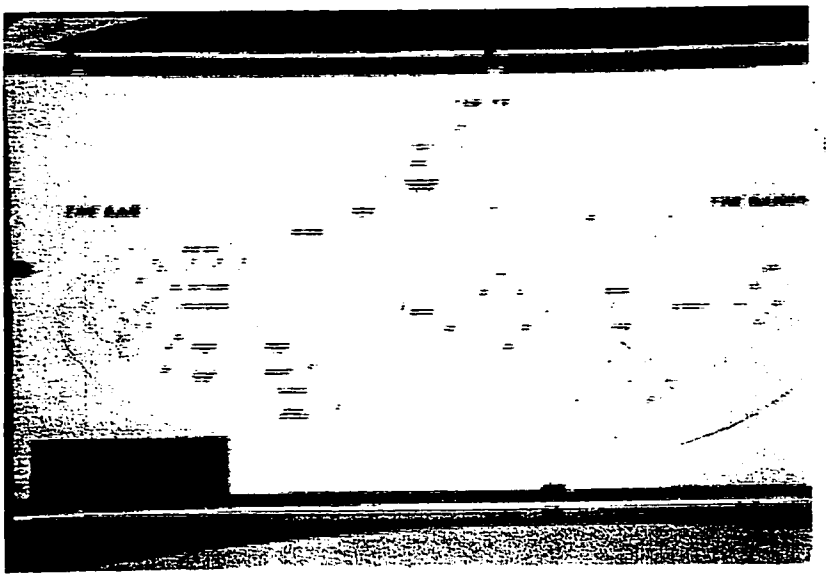
25e: A viewer 's hand makes choices through a touch sensitive screen.

25f: A schematic of the pathways to be explored by the viewer demonstrate the composition of the interactive work.[258]

e

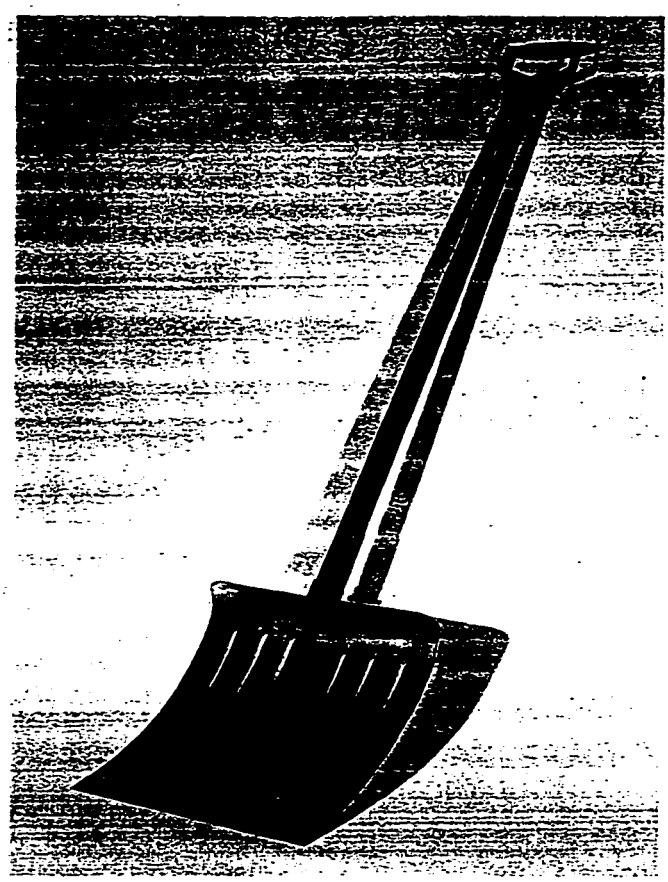


f



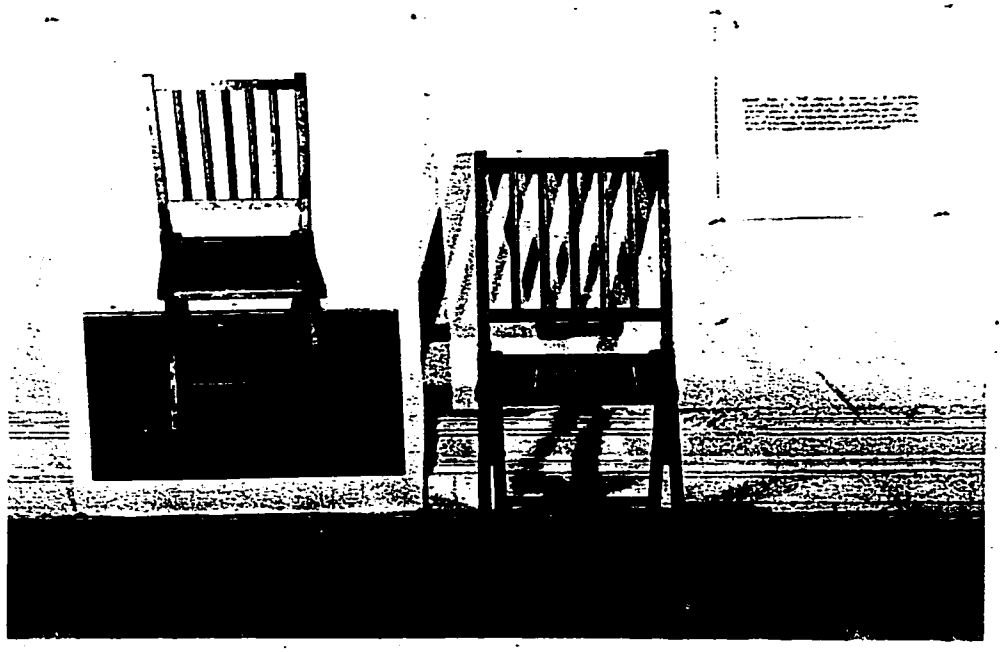
[258] Diamond, videocassette. Segment "Deep Contact - Lynn Hershman and Sara Roberts."

Illustration 26: In Advance of the Broken Arm (1915) 39 3/8" high, Ready-made (snow shovel) by Marcel Duchamp (New York).[259]



[259] Arman, plate III.

Illustrations 27 and 28: One and Three Chairs (1965) and Art as Idea as Idea (1967) by Joseph Kosuth.[260]



27

1. *Idea*, adopted from L, itself borrowed from Gr *idea* (ἰδέᾱ), a concept, derives from Gr *idein* (s *id-*), to see, for **widein*. L *idea* has derivative LL adj *ideālis*, archetypal, ideal, whence EF-F *idéal* and E *ideal*, whence resp F *idéalisme* and E *idealism*, also resp *idéaliste* and *idealist*, and, further, *idéaliser* and *idealize*. L *idea* becomes MF-F *idée*, with cpd *idée fixe*, a fixed idea, adopted by E Francophiles; it also has ML derivative **ideāre*, pp **ideātus*, whence the Phil n *ideātum*, a thing that, in the fact, answers to the idea of it, whence 'to *ideate*', to form in, or as an, idea.

28

[260] Meyer, 152, 154.

Illustration 29: Virtual Reality Mandela System (1986), interactive installation, 25 sq. m., Vincent John Vincent and the Vivid Group.[261]

Images of viewers in the installation are captured onto video and combined (in real time) with computer graphics so that viewers' movements affect the movements of objects in the imagery and the sounds that they produce.

[261] Major and Fischer, Images du Futur 1993, 54. The first public art installation of the Mandela System was in 1986 at the CITY TV Broadcasting Station, Queen Street, Toronto.

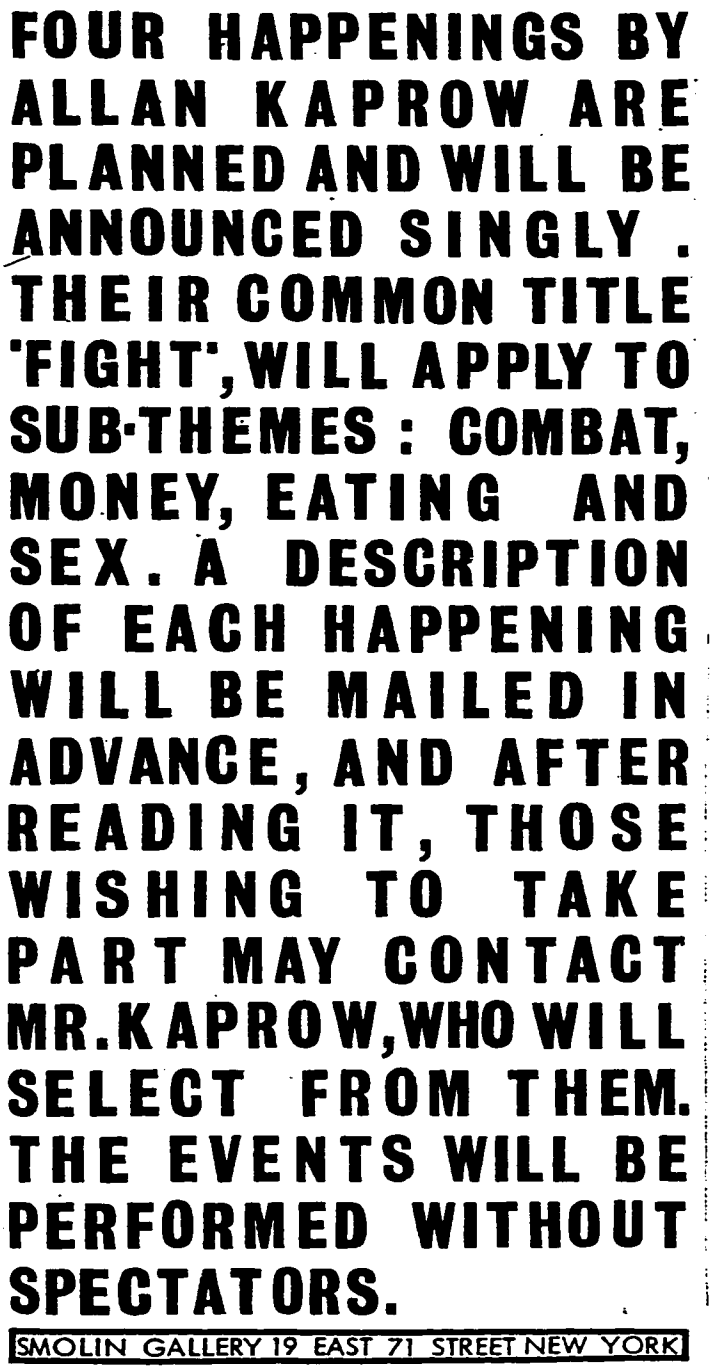
Illustration 30: Electronic Café, interactive telematic arts project (July-September, 1984), Kit Galloway and Sherrie Rabinowitz.[262]

This image shows the computer system set up at "Ana Maria's Restaurant" -- one of five selected locations of various ethnicities within Los Angeles. These five centres were interactively linked through satellite, so that video images, drawn images and text could be exchanged between the participants. (Electronic Café ran for seven weeks, six days a week.)

[262] Durland, 58.

Illustration 31: *Fight*: Four Happenings by Allan Kaprow, poster for Fluxus event (October 1963).[263]

This advertisement claims a happening that will transform viewers into participants.




[263] Happening & Fluxus: Materialien, non-paginated.

Illustration 32: "You" a Décollage Happening, poster for Fluxus event (1964), by Wolf Vostell.[264]

This advertisment describes a happening that includes audience participation.


[264] Happening & Fluxus: Materialien, non-paginated.

Illustration 33: "New Happenings at the Reuben Gallery", poster (1960-1961).[265]

This poster shows the intention of the Reuben Gallery (New York) to increase patronage by advertising happenings that include audience participation.

# new happenings

at the

# Reuben Gallery

The Reuben Gallery will devote its 1960 - 1961 season exclusively to a series of evening exhibitions of art in a new dimension. A workshop for 'happenings' has been created by the artists who last year began to explore this new form.

| | | |
|---|---|---|
| Jim Dine | CAR CRASH | Nov. 1 thru 6 |
| Robert Whitman | THE AMERICAN MOON | Nov. 29 - Dec. 4 |
| "VARIETIES" | (short pieces by members) | Dec. 16 - 18 |

- Dates to be announced -

Allan Kaprow
Red Grooms
Claes Oldenburg
George Brecht

Oldenburg -- "Off-beat... thoroughly enjoyed..." TIME

Whitman -- "Daring... witty...." Tallmer, Village Voice

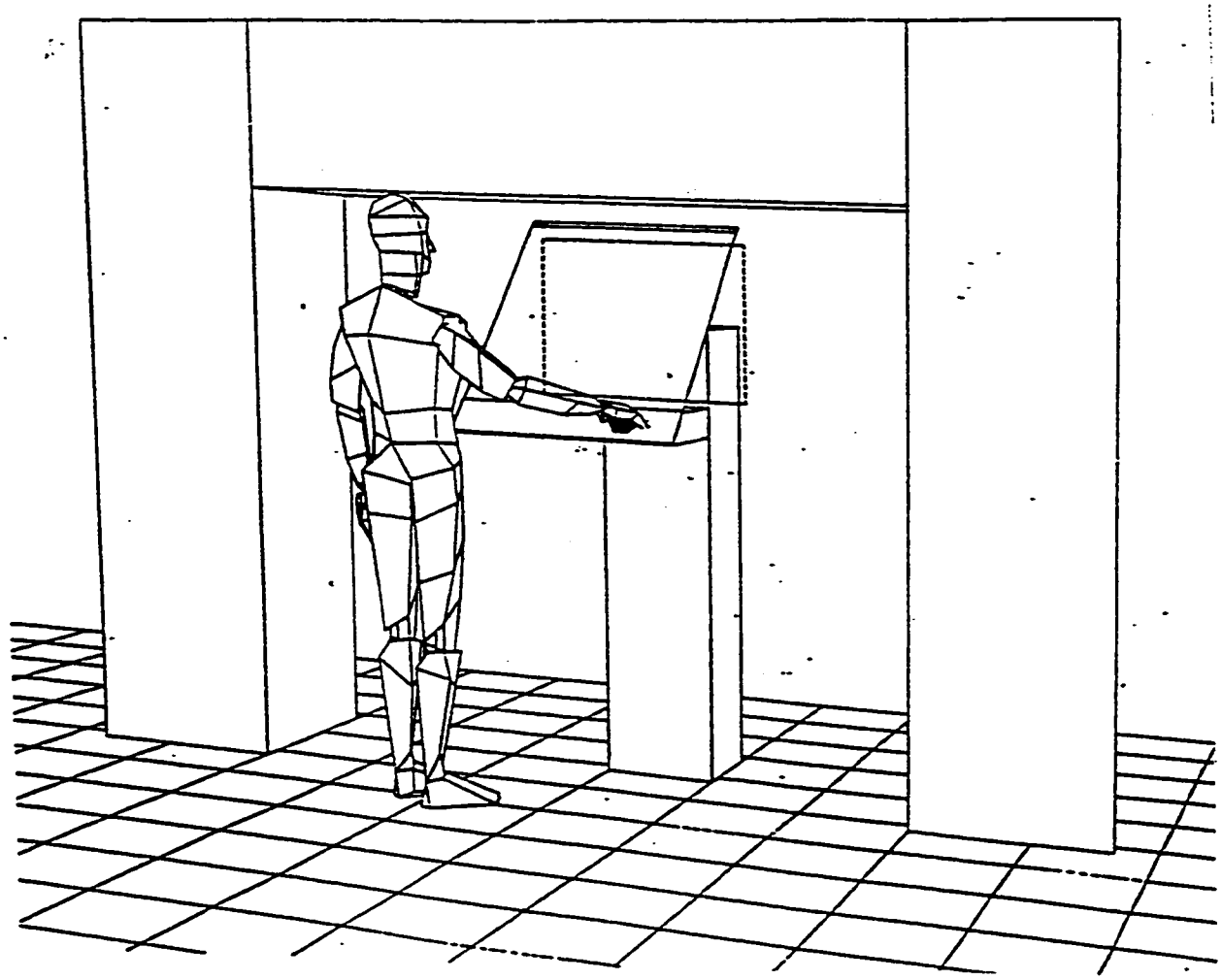

You are invited to become a patron -- and participant -- in these exhibitions, which we of the Reuben Gallery feel will be among the most exciting evenings of the New York season. Your tax-deductible contribution will not only make these 'happenings' happen financially, but will assure you of seating on your choice of evenings. Each performance will run for one week, except Monday. Last year many had to be turned away because of capacity audiences. So don't be disappointed: send your contribution today in the attached envelope.

---

[265] Happening & Fluxus: Materialien, non-paginated.

Illustration 34: Portrait One (1990), line drawing, Luc Courchesne.

Viewers interacted with a virtual person through a computer keyboard. This work would later evolve into Family Portrait, Encounter of a Virtual Society (1993) in which there were four "stations" for viewer interaction.[266]



[266] Courchesne provides the exhibition history of Family Portrait: "Family Portrait was premiered in Marseille in July 1993, travelled to SIGGRAPH in Anaheim, Ca, in early August 93 and then was shown in The National Gallery [Ottawa, Canada]. It has since been shown at the Museum of Modern Art in New York of last summer June to August, and the Power Plant in Toronto." (Courchesne, electronic mail.) (Image provided by the artist.)

Illustration 35: Satellite Arts Project: A Space With No Boundaries (1977), Kit Galloway and Sherrie Rabinowitz.[267]

Video images of dancers located 3000 miles apart (NASA Goddard Flight Center, Maryland and the Educational TV Center, Menlo Park, California) were combined in a virtual space. Monitors showing the composite image were present at both sites.

[267] Durland, 54.

Illustration 36: Hole in Space: A Public Communication Sculpture, interactive telematic arts project (1980), Kit Galloway and Sherrie Rabinowitz.[268]

This image depicts two interacting groups of people (one is silhouetted). Video cameras set up at the Lincoln Center for the Performance Arts in New York and the Broadway department store, Century City, Los Angeles, recorded the actions of passers-by on the street and sent these images in real time to video screens on opposite coasts. This event lasted for three days.

[268] Durland, 56.

Illustration 37: Poster for telematic performance by David Rokeby, Don Ritter, John Oswald and Jocelyn Robert. On April 3, 1993, as part of the "Le Corps Amplifée" series, Toronto and Quebec city audiences witnessed the linkage of two interactive performance systems via sophisticated telephone lines.

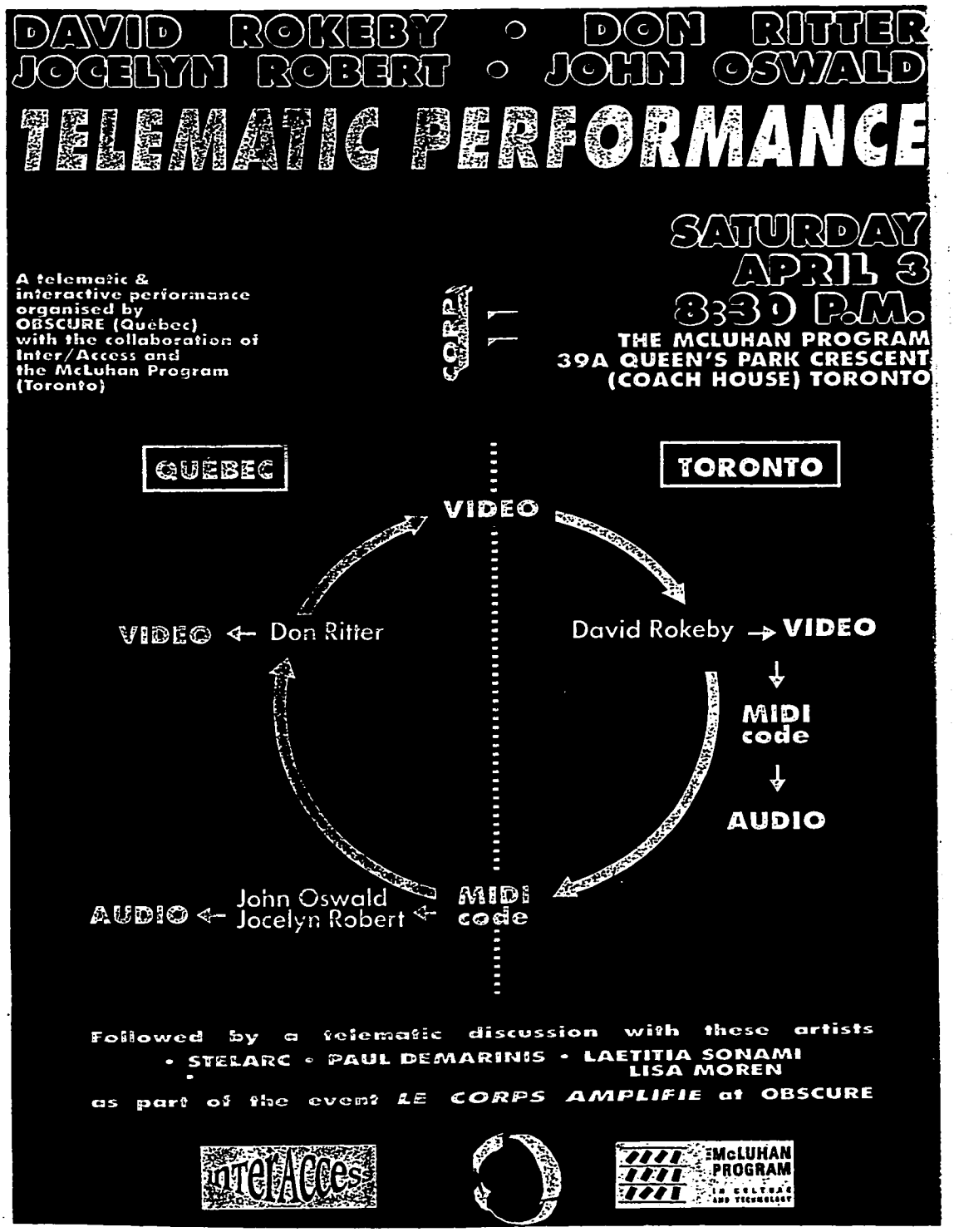
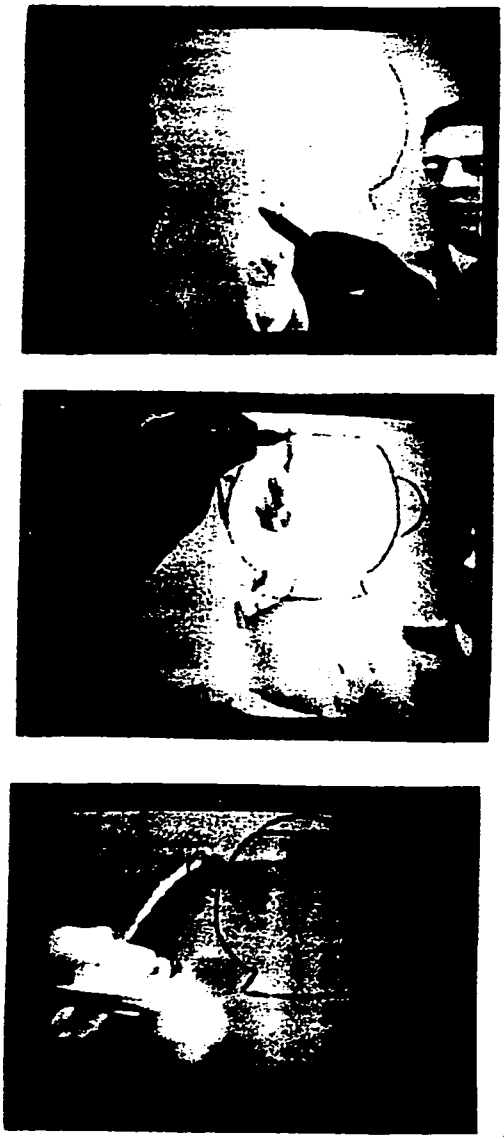


Illustration 38: Three video stills from one episode of Winky Dink and You (1950s).[269]

Using special markers and a plastic screen overlayed on their television sets, children were invited to draw on the screens of their televisions in order to complete the images narrated in stories. These images show that a drawn tea kettle soon pours liquid.



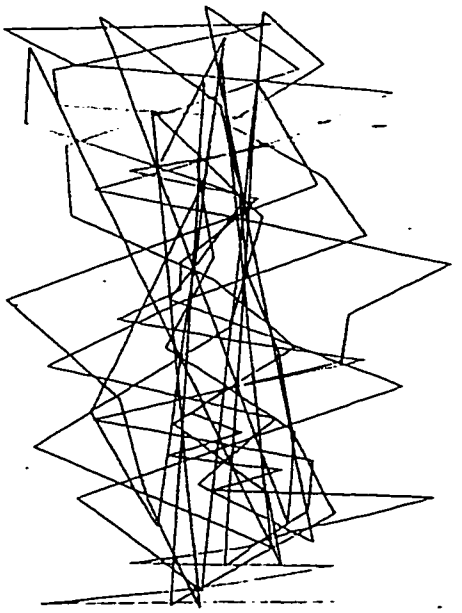
[269] Hershman, "Bodyheat," 46.

Illustrations 39, 40 and 41: Computer graphic creations by A. Michael Noll created in the 1960s while Noll was at Bell Laboratories in Murray Hill, New Jersey.

39: Gaussian Quadratic, computer graphic (1962). This was the author's first serious piece of computer art, which he found suggestive of Cubism.

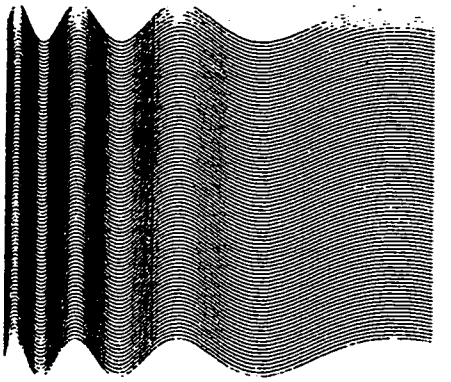
40: Computer Composition with Lines, computer graphic (1964). This work closely approximates a painting by Piet Mondrian.

41: Ninety Parallel Sinusoids With Linearly Increasing Period, computer graphic (early 1960s). This work was strongly influenced by Bridget Riley's Current and is an example of the application of computers to Op-art.[270]



39

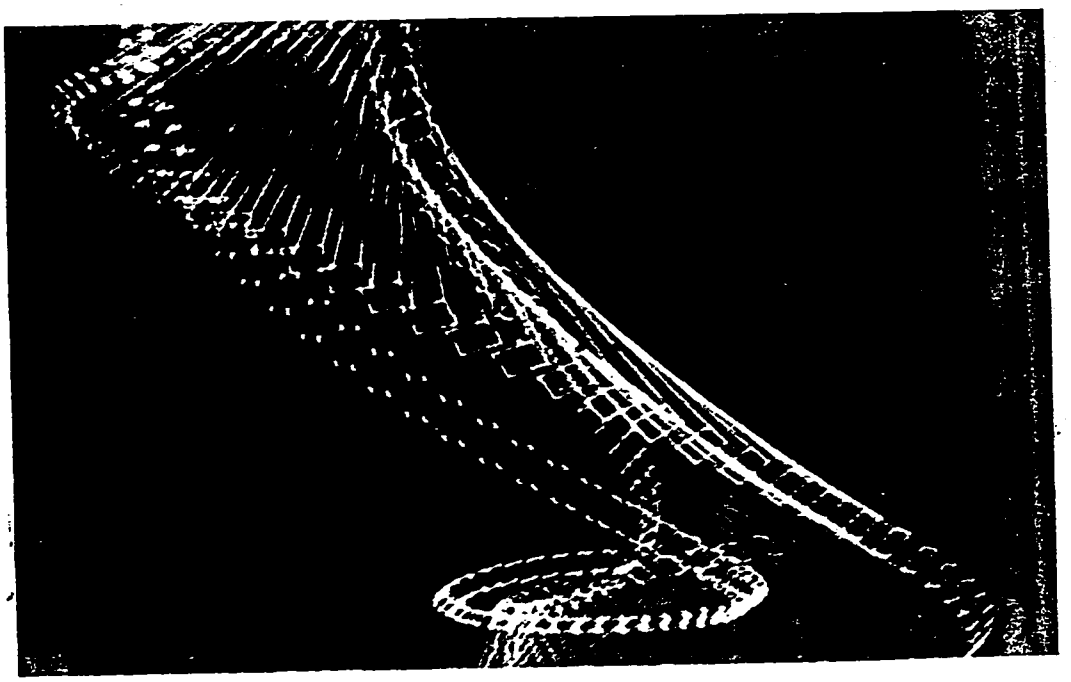
40



41

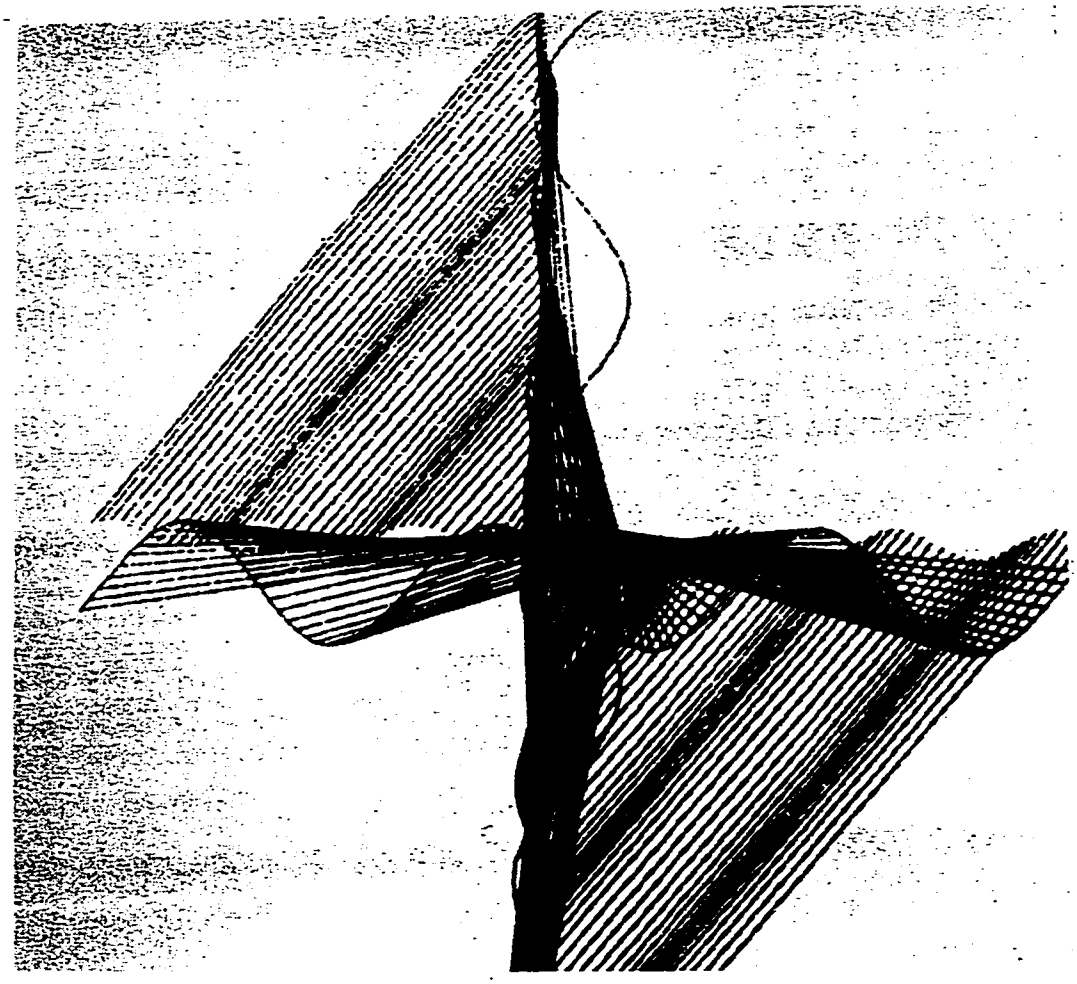
[270] Noll, 40.

Illustration 42: Computer art by Vichy Chaet (1968).[271]



[271] Wilson, "Computer Art," 15.

Illustration 43: Computer art by Stephen Wilson (1980).[272]



[272] Wilson, "Computer Art," 18.

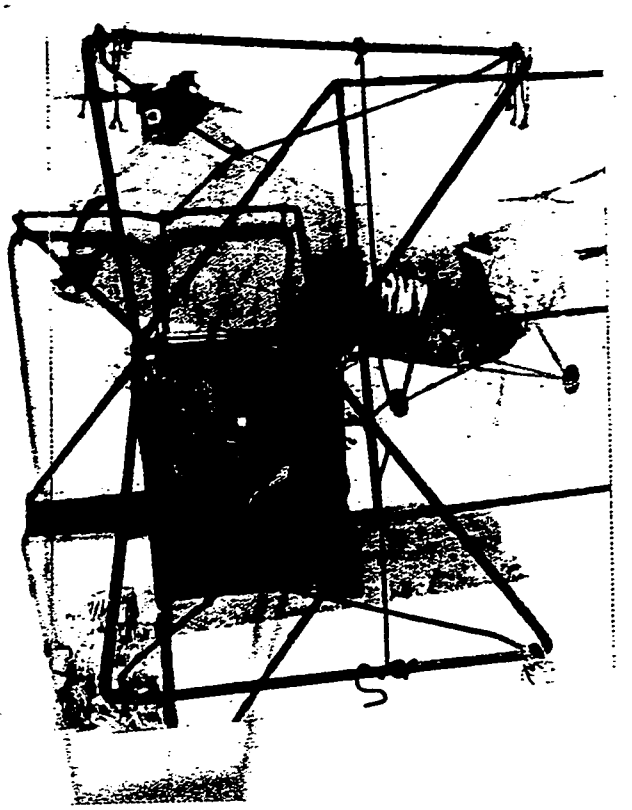
Illustration 44: Black Market, (1961) 49 x 59", Robert Rauschenberg. The work consists of oil, paper, wood, metal, rope, four metal clipboards, valise with rubber stamps and various objects. Collection: Ludwig Museum, Cologne, West Germany.

Lawrence Alloway writes: "Four metal clipboards with blank paper are attached to the canvas. In the open case on the floor below are directions, an assortment of objects, and four numbered rubber stamps corresponding to the numbers on the clipboards. (The stamps also bear the name of the piece and the artist's name.) Each object in the case has been stamped with a number and a signed drawing of the object appears on the matching clipboard. The gallery visitor is invited to remove an object from the case in exchange for an object to replace it. The person making the exchange then stamps the new object and makes a drawing of it on the paper of the appropriate clipboard."[273]


[273] Lawrence Alloway, Robert Rauschenberg (Washington: Smithsonian Institution, 1976), 114.

Illustration 45: Dry Cell, (1963) 15 x 12 x 15", Robert Rauschenberg. The work consists of silkscreen ink and paint on plexiglass, metal, string, sound transmitter, wire, circuit board, a motor and batteries. Artist's collection.[274]

Sounds spoken by gallery visitors into a microphone on the face of the work activate a toy motor to spin a propeller-like piece of metal. Dry Cell is one of the earliest electronically interactive pieces.



[274] Alloway, 121.

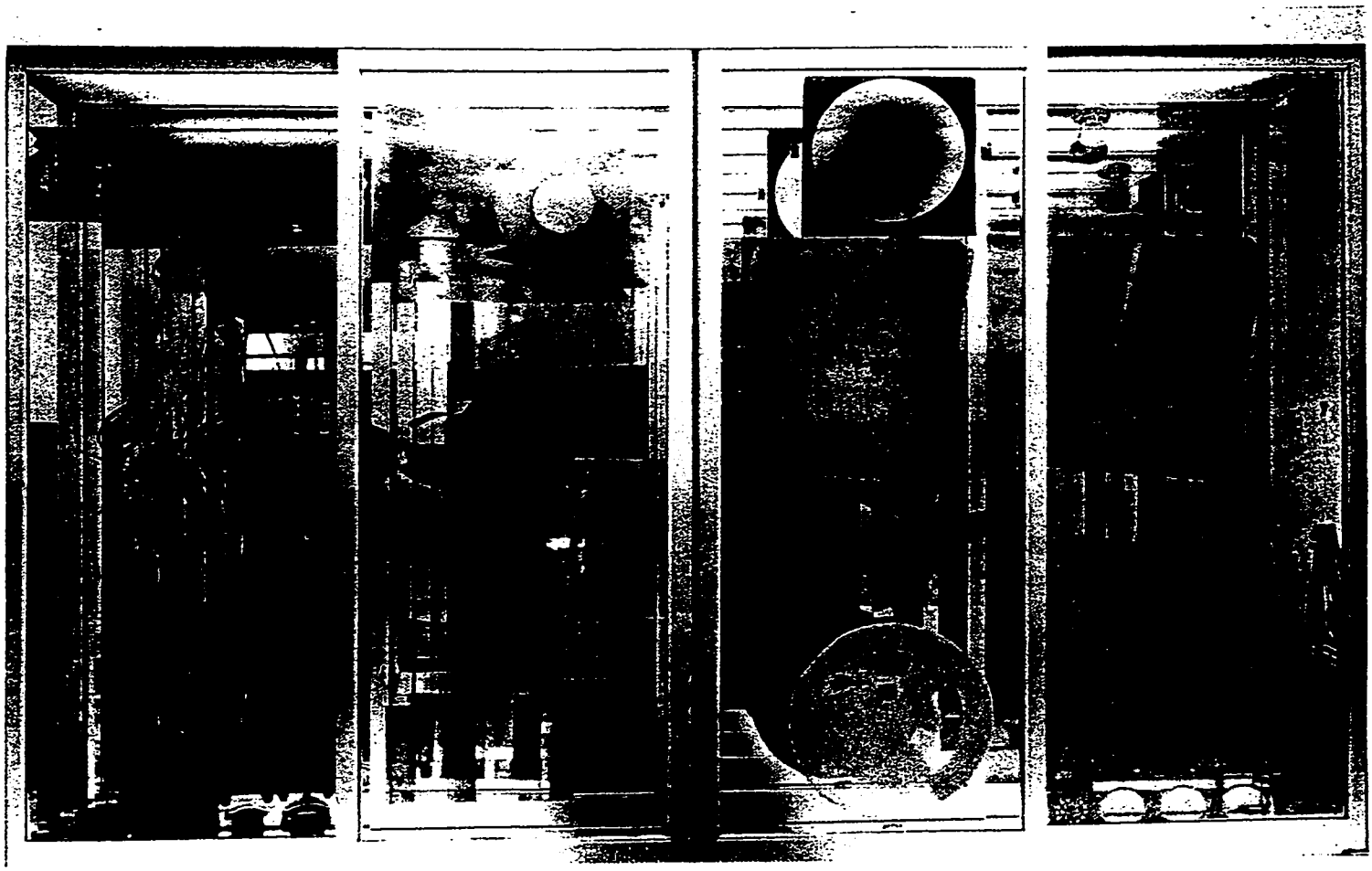
Illustration 46: Oracle, (1965) Robert Rauschenberg. This work contains sheet metal with iron, rubber tires, glass fragments, batteries, wire and electronic components. Collection: Musée national d'art moderne: Centre national d'art et culture Georges Pompidou, Paris.[275]

Five mobile pieces of sculpture contain motors that continuously alter the dials of AM radios contained within each piece. Gallery visitors control the overall playing of the radios by playing with the knobs on the top of the step sculpture (shown on the left).

[275] Alloway, 124.

Illustration 47: Solstice, (1968) Robert Rauschenberg. The work consists of silkscreened ink on plexiglass and metal, and electrical light fixtures. Dimensions: 192 x 192 x 144 (four rows, each with four sliding panels). Collection: Automation House, New York City.[276]

Viewers trigger, and can walk through, four sets of automatic sliding doors in order to explore the silkscreened ink images.



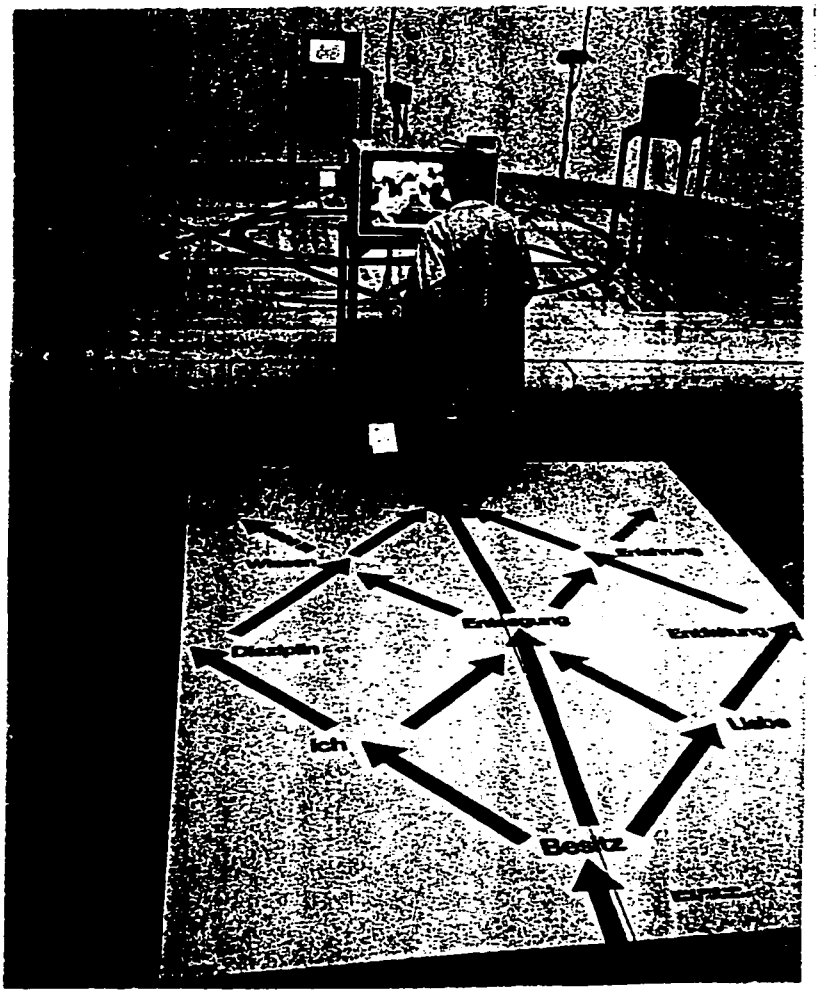
[276] Alloway, 128.

Illustration 48: Soundings, (1968) Robert Rauschenberg.[277]

Noises made by viewers trigger the lighting of silk-screened images of chairs placed behind partially mirrorized panels, so that different parts of the work could be lit at different times.

[277] Alloway, 129.

Illustration 49: Autohypnose, Valie Export (1973)[278]



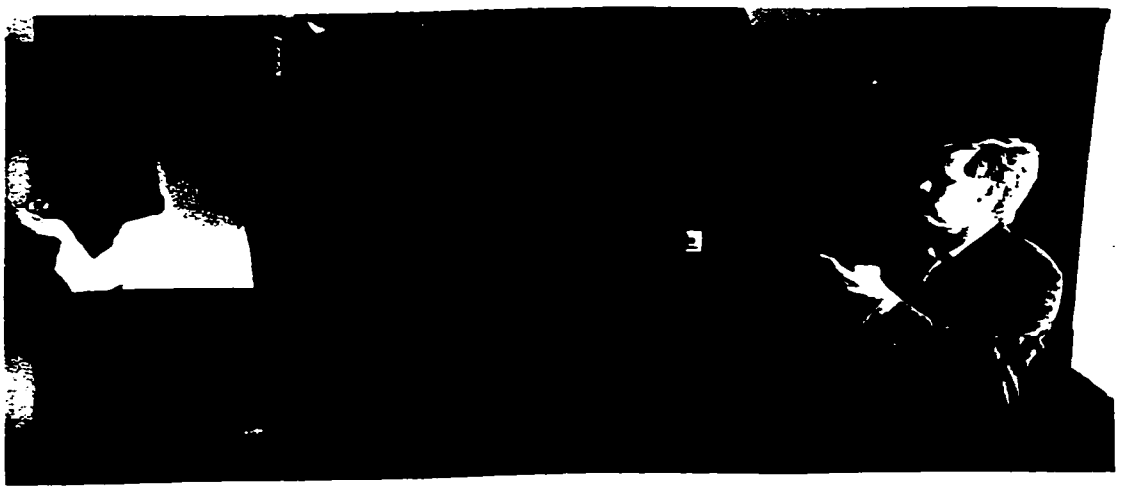

[278] Cornwell, "Interactive Art," 208.

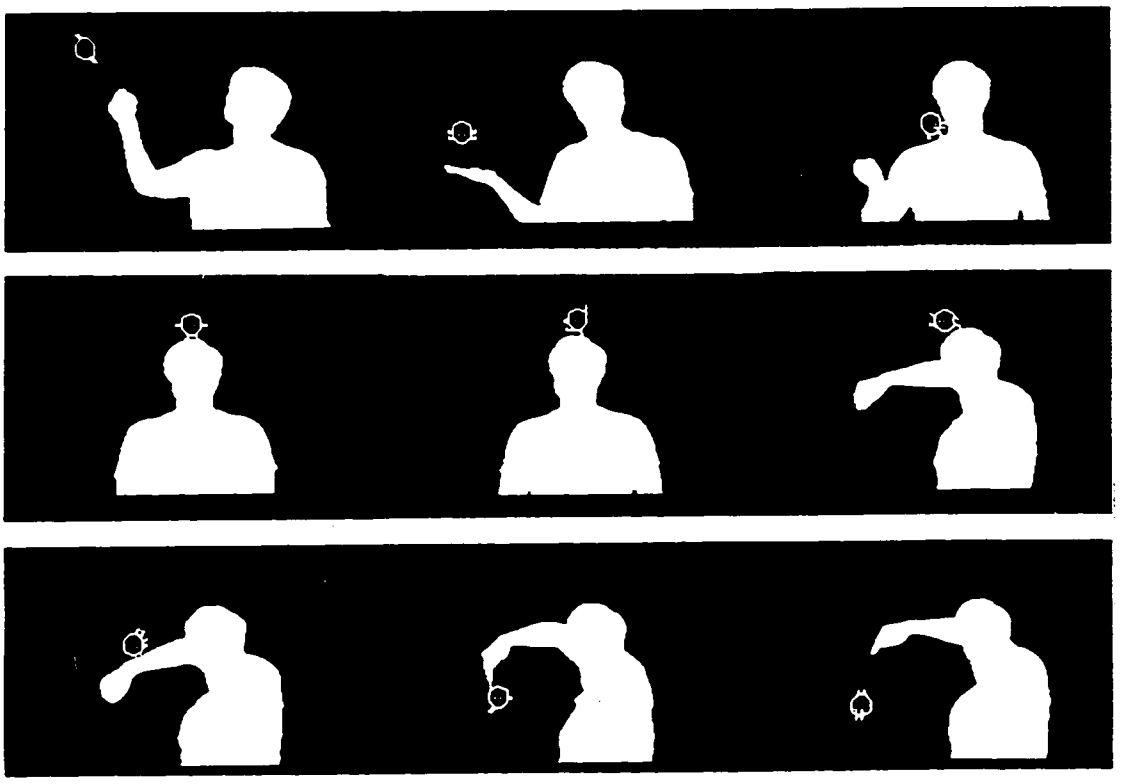
Illustrations 50a and 50b (of 50a to 50d): Videoplace (1969-1985), an interactive medium, being developed in the artificial reality laboratory or Myron Kreuger.[279]

50a: An outline of the participant is seen on the video screen (on the left) interacting with a computer graphic symbol; the participant controls the actions of the symbol.

50b: An interaction sequence is depicted.

a





b

[279] Krueger, 146.

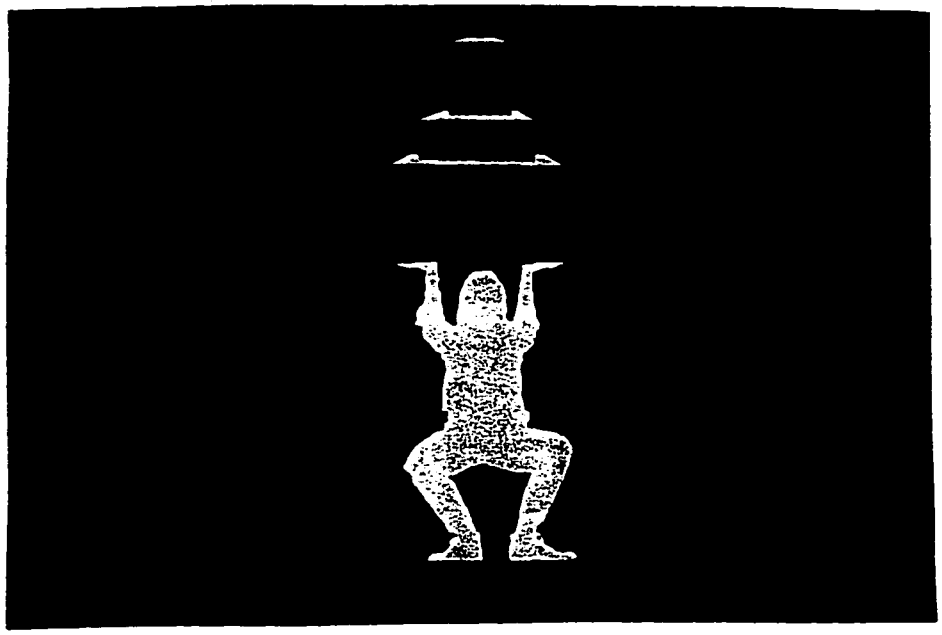
Illustrations 50c and 50d (of 50a to 50d): Videoplace, Myron Kreuger.[280]

50c: The camera (left) positioned below the video projection screen, picks up the image of the participant.

50d: The participant's image is depicted on the video screen lifting a graphic object.

c

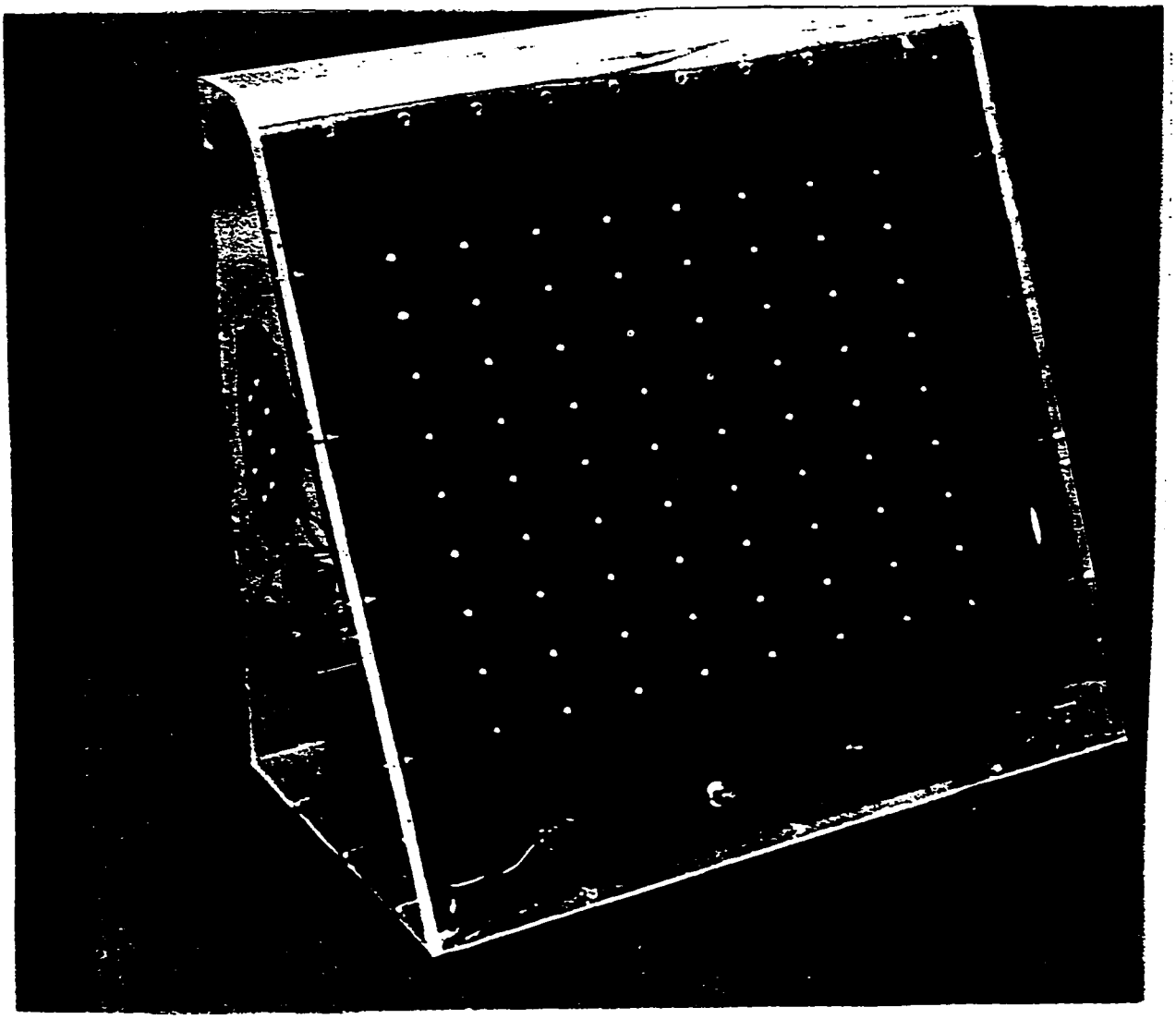
d



[280] Krueger, 146, 147.

Illustration 51: State of the Art (1974), "participatory" work by Norman White.

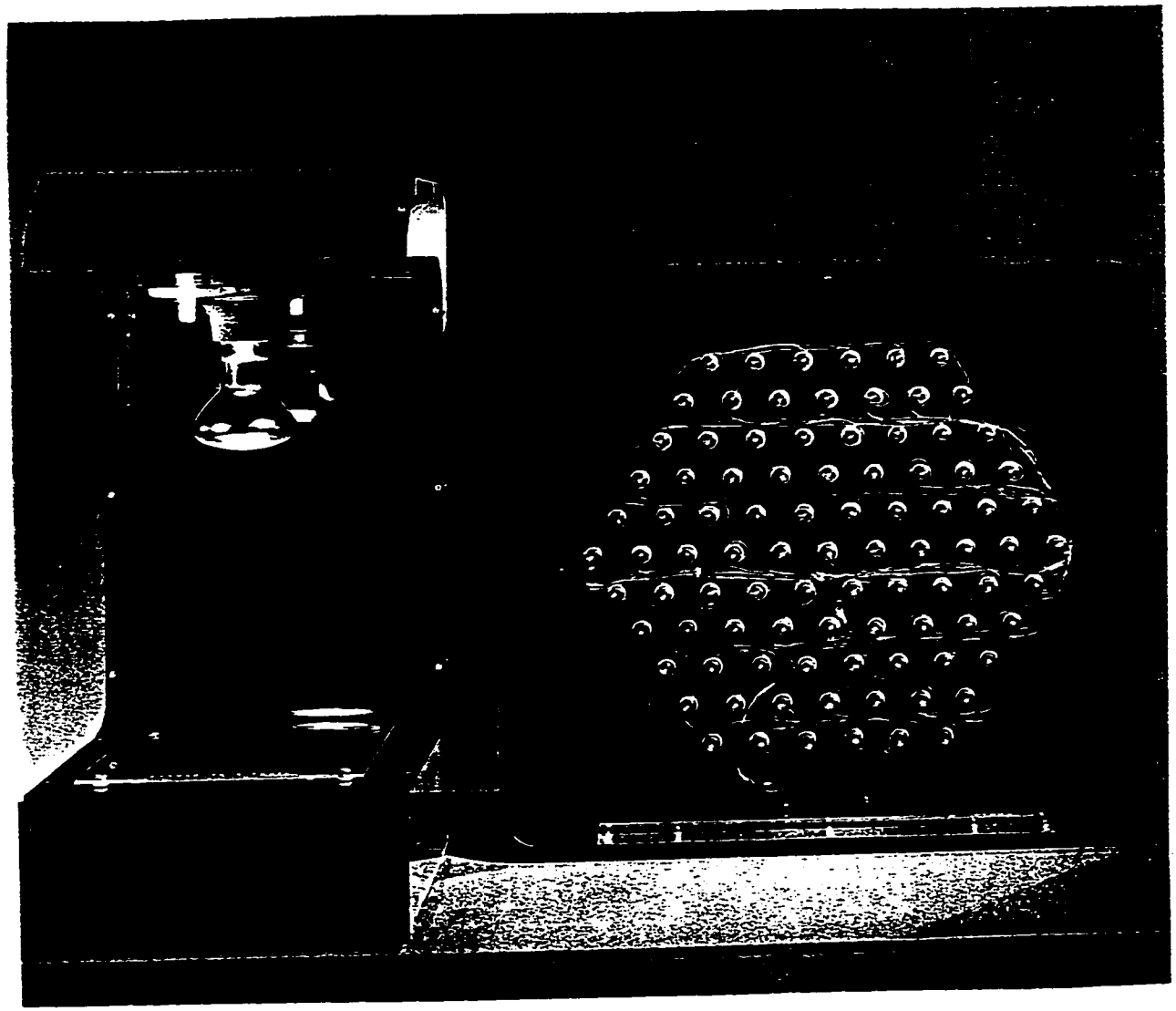
The viewer participates by "pressing the reset button which places the lights at the 'start position', and the speaker tones at base frequencies, the latter changing according to the movement of the lights."[281]



[281] White, 26.

Illustration 52: Gestalte Fish (1974), "participatory" work by Norman White.

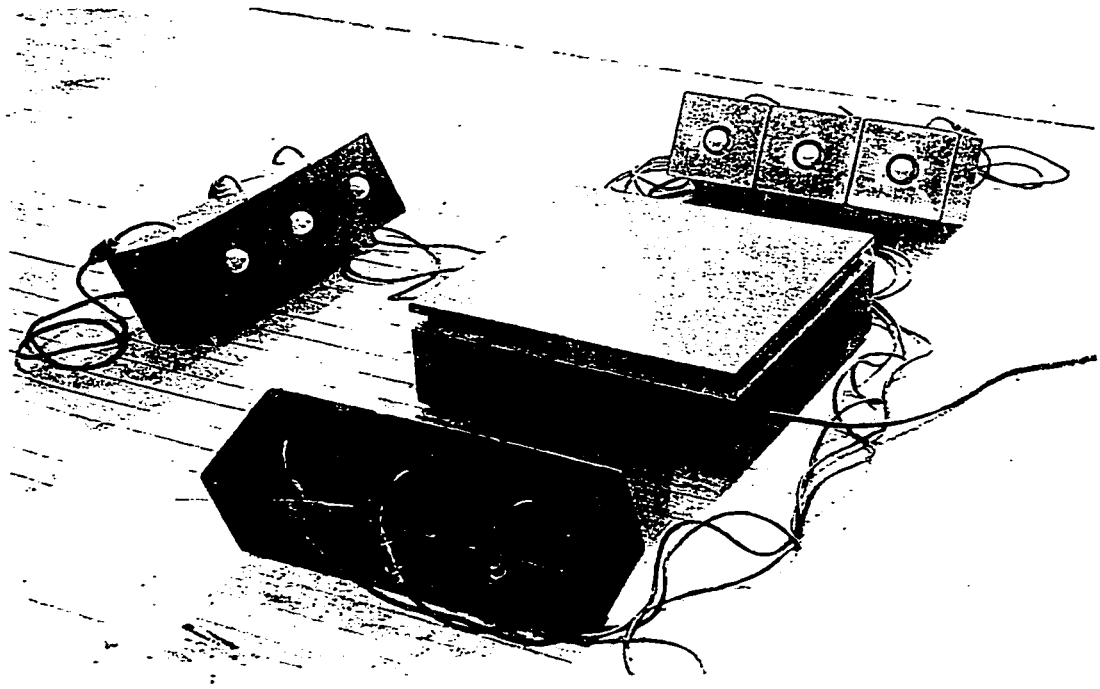
The viewer's shadow cast over photosensitive cells on the sensor module (left) is translated into various light patterns on the read-out module (right).[282]



[282] White, 21.

Illustration 53: On Stage (1970), Ian Carr Harris.[283] (This work has since been destroyed.)

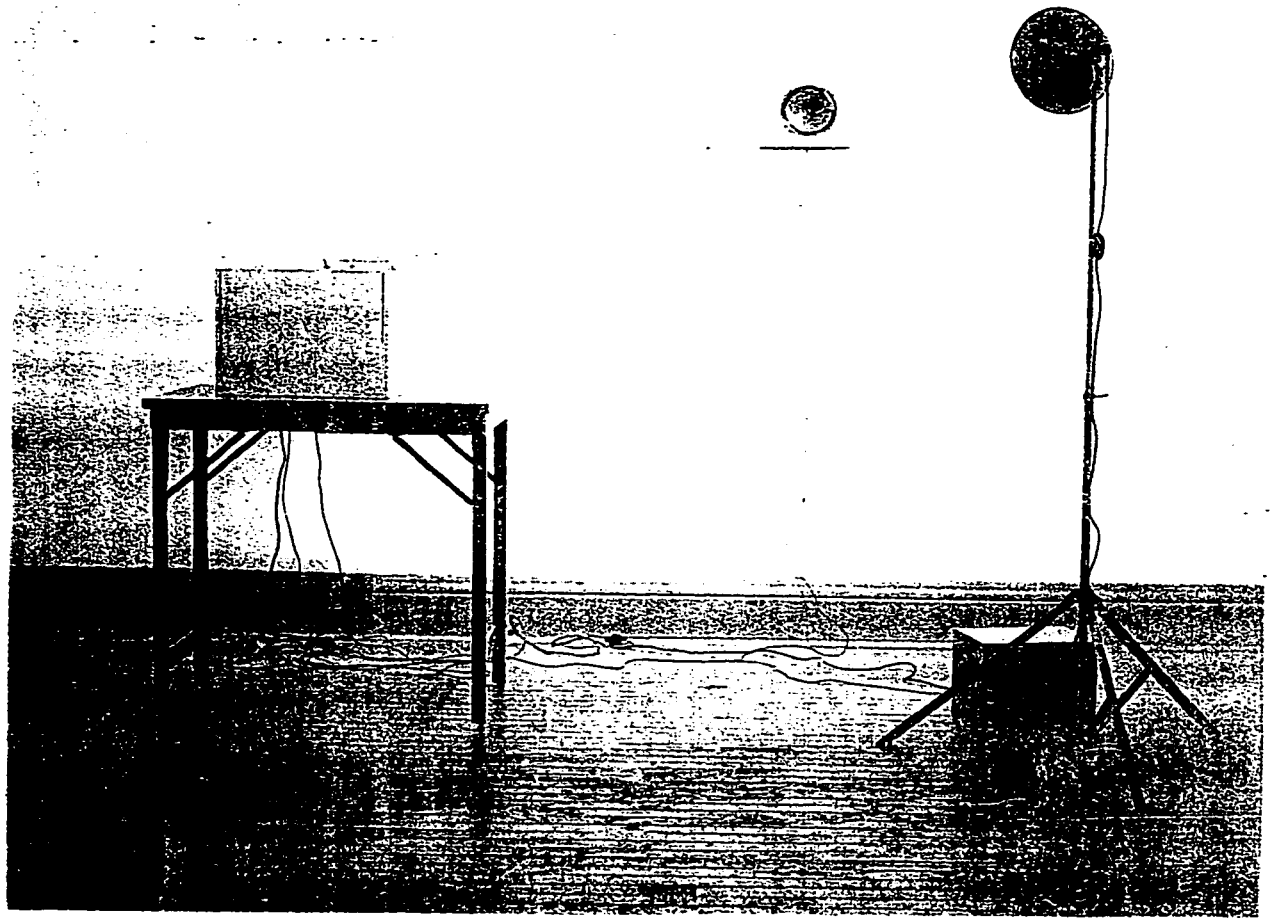
When viewers step onto the platform, lights are activated.



[283] Jessica Bradley, Ian Carr-Harris, Liz Magor: Canada XLI Biennale di Venezia 1984 (Ottawa: The National Gallery of Canada, 1984), 8.

Illustration 54: In German (1982), by Ian Carr Harris.[284] Collection: Carmen Lamana Gallery, Toronto.

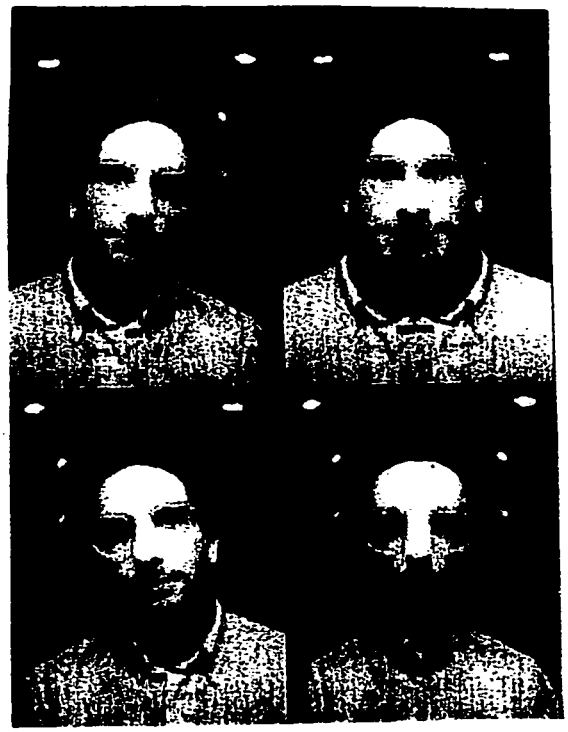
When a button is pressed (located on top of the box on the left), a light switches on that floods a speaker with light; the speaker then emits sounds of a man nervously clearing his throat.



[284] Bradley, 10.

Illustration 55: SYM-ulations (1986), interactive installation by Ed Tannenbaum.

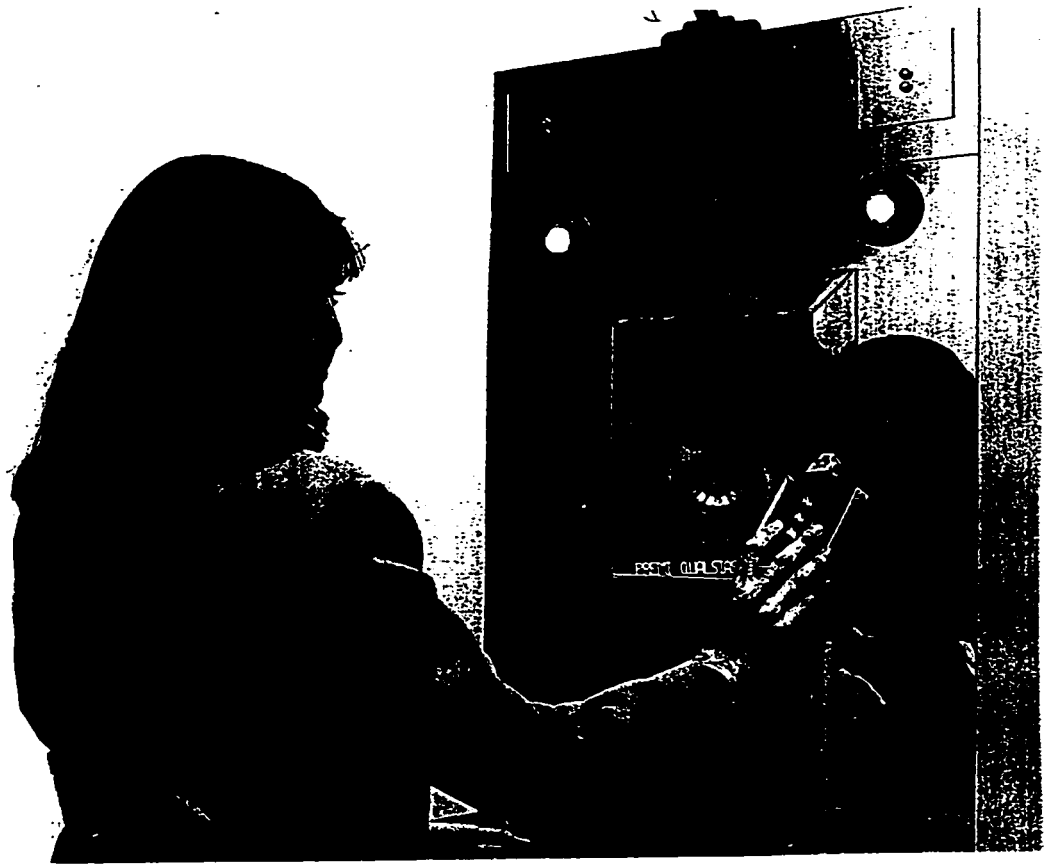
The viewer's portrait is transformed by computer to produce the following effects: *upper left* - normal; *lower left* - mirrored; *upper right* - both lefts; *lower right* - both rights.[285]



[285] Pomeroy, 282.

Illustration 56: Telespecchio (1992) interactive installation by Sabine Reiff and Flavia Alman.

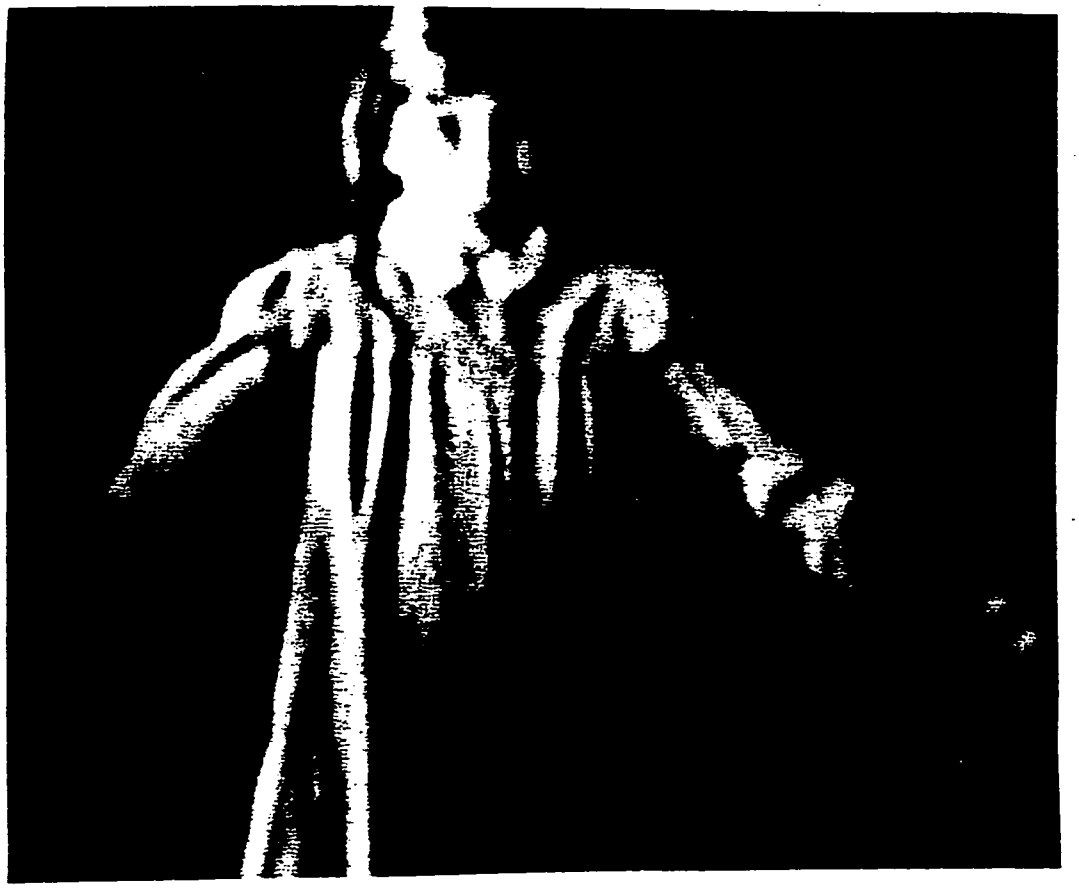
The viewer's portrait is transformed by computer according to "symmetry", "caricature" or "Dorian Gray" effects.[286]



[286] Major and Fischer, Images du Futur 1995, 24.

Illustration 57: Tall Ships, interactive video installation (1992), Gary Hill.[287]

Exhibited at the Ydessa Hendeles Foundation in Toronto in the summer of 1993, Tall Ships created non-verbal dialogues between viewers and moving video personages. As one enters a darkened room, one views approximately one dozen video projections of people (males and females of varying ethnic heritages and ages) on the walls of the room. These virtual beings ("Anastasia" shown below) seem pre-occupied until motion detectors detect the movements of participants and these video projected people are triggered to respond.[288] On cue, the "phantoms" appear to walk towards viewers and acknowledge their presence with various body gestures.



[287] Richard Rhodes, "The Narrator," Canadian Art, 10, no. 3 (1993): 41.

[288] To illuminate the manner in which the piece was set up, motion detectors trigger video imagery of virtual people to move on very small television sets which hang from the ceiling. Small mirrors are placed close to these televisions in order to reflect the video imagery onto surrounding walls. The magnification of these images produced very grainy figures that, as a result, create both ghost-like figures and a phantom atmosphere.

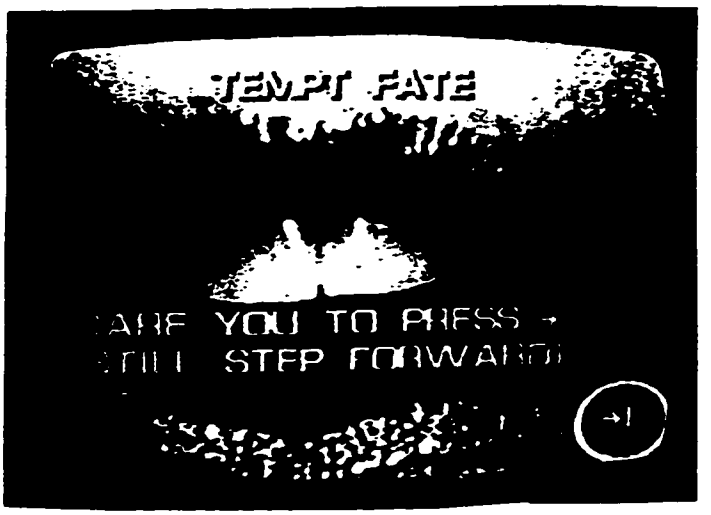
Illustration 58: Echoing Narcissus (1987), interactive sculpture by David Rokeby.[289]

Viewers speaking into a well-like sculpture hear their own voices, electronically altered, as echoes.

[289] Barrett, 6.

Illustrations 59a and 59b (of 59a to 59d): Two video stills of Lorna (1983-1984), an interactive videodisc installation by Lynn Herhsman.[290]

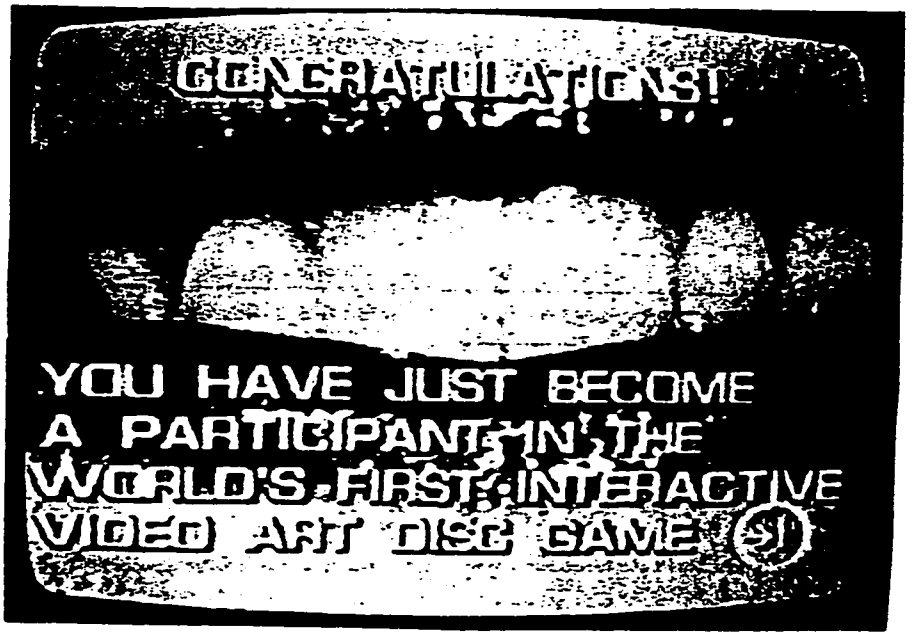
a




b

[290] Loeffler, 53.

Illustrations 59c and 59d (of 59a to 59d): Two video stills of Loma by Lynn Hershman.[291]


d

[291] Hershman, "Touch-Sensitivity," 433.

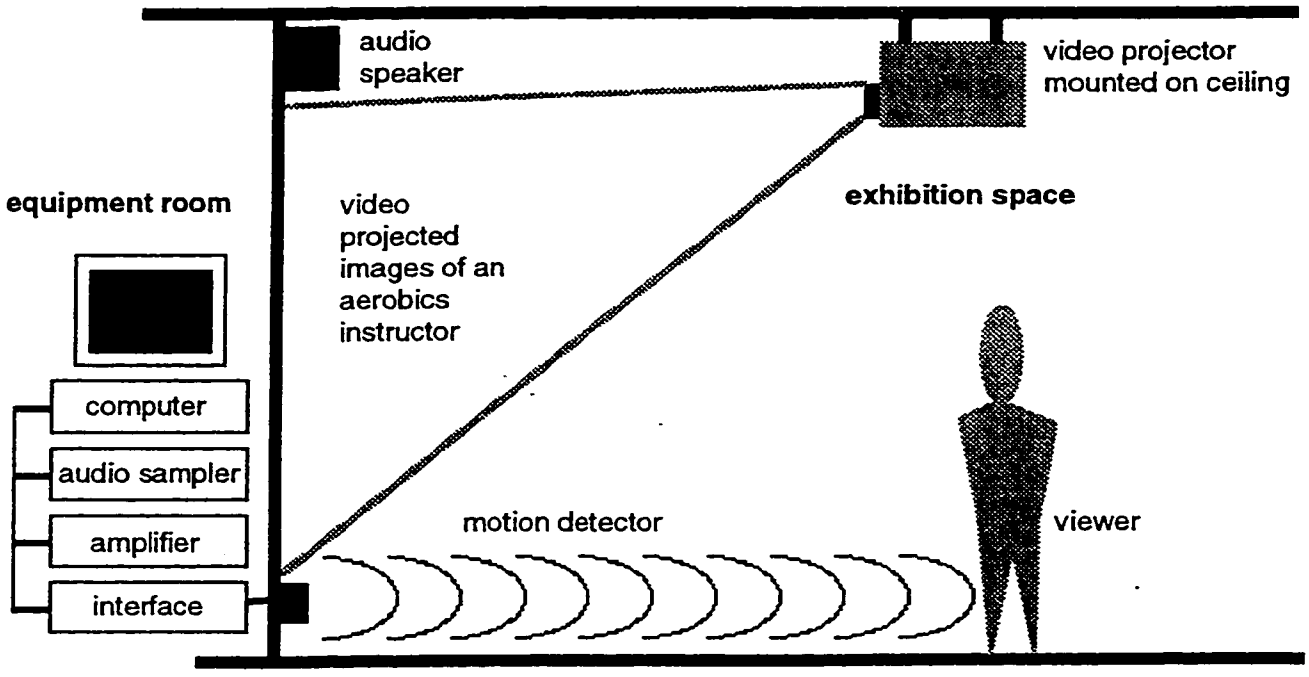
Illustration 60: Faraday's Garden (1993), viewer-activated "symphonic appliance installation", floor sensors, appliances, projectors, 20 x 30 m, Perry Hoberman.[292]

As viewers walk along a pressure sensitive floor path, a plethora of electronic appliances whir on and off.

[292] Major and Fischer, Images du Futur 1993, 19.

Illustration 61: Fit (1993), interactive video and sound installation, Don Ritter.[293]

When a viewer moves within the installation, motion detectors trigger a video-projected aerobics instructor to respond and music to play. The viewer's rate of exercise is mimicked by the video instructor and the tempo of the music. (Forty potential exercises are represented in the work.)




[293] Images courtesy of the artist.

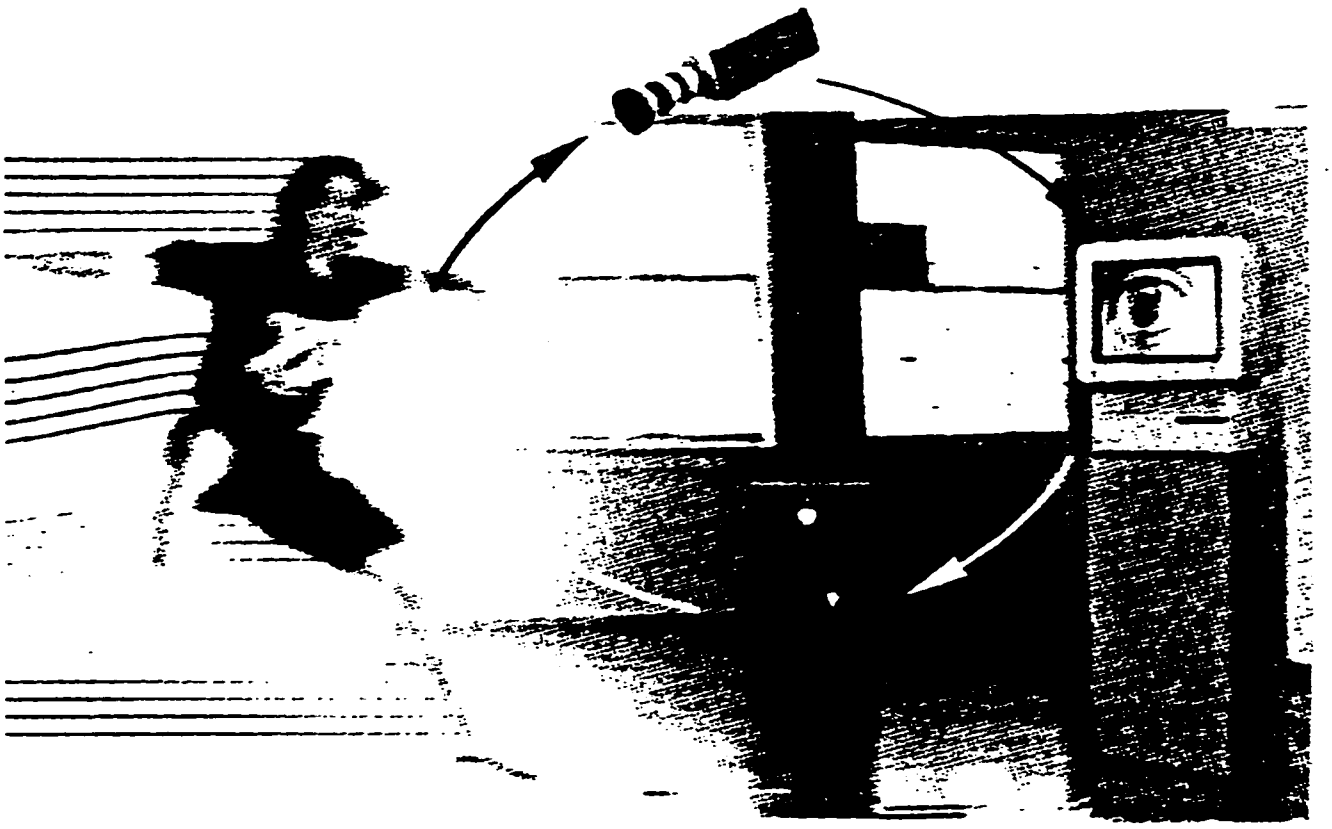
Illustration 62: The Automatic Confession Machine: a Catholic Teering Test (1993), interactive computerised confessional by Greg Garvey.[294]

Viewers offer confession electronically by responding to questions and statements prompted by computer. Viewers can get print-outs of their responses.

[294] Major and Fischer, Images du Futur 1994, 36.

Illustration 63: Very Nervous System (1983-1986) by David Rokeby.[295]

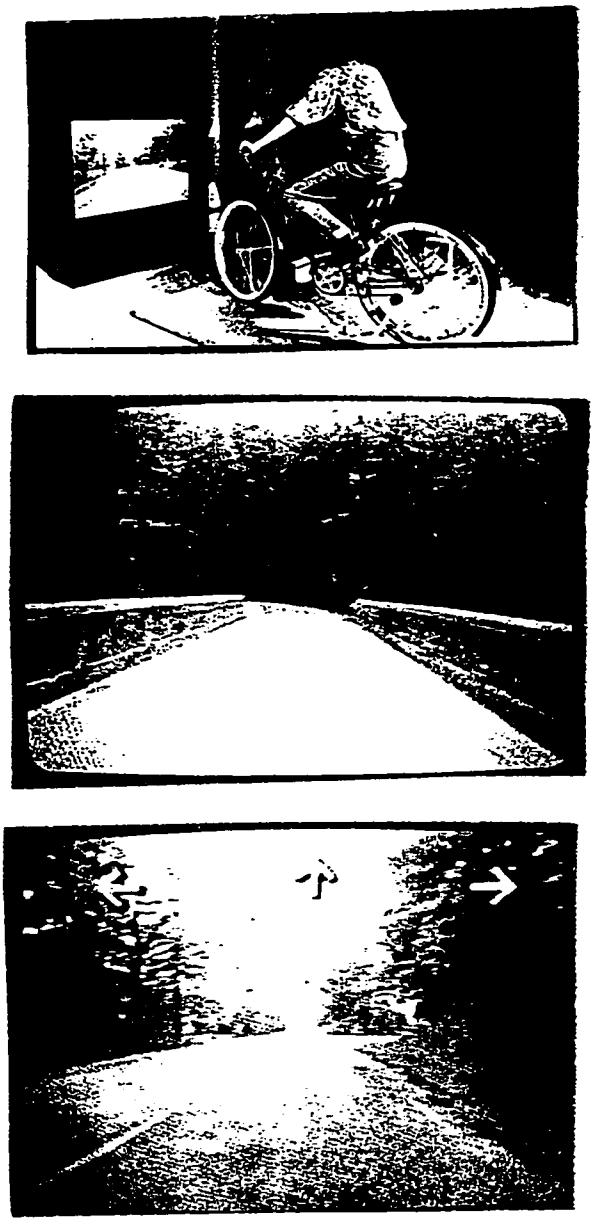
Images of participants' bodies are picked up by camera and sent to Rokeby's "Very Nervous" computer system. The program translates frame by frame differences into an audio output.



[295] Rokeby lists the history of VNS's development: "Initial concept development was in 1981. First working (sort of) installation was spring of 1982. First actual public exhibit was spring of 1983 at Open House at the Ontario College of Art. First professional exhibition [was at] Digicon '83 at the Robson Square Media Center in Vancouver, B.C. (August 1983) (Digicon was a conference of Digital Arts). First Gallery exhibit: ArtCulture Resource Center, September 1983. At this time, the system was called Reflexions. The name Very Nervous System was first used in 1986 at the McDonald-Stewart Art Center at Guelph University as the name of a program running on the system which was at that point called Body Language. The first time Very Nervous System was used as the title of the complete installation was at the Venice Biennale in June/July/August 1986." (Rokeby, electronic mail.) Source of image: Farah, "Machines in the Garden", 49.

Illustration 64: Bicycle TV: Some Interactive Exercise (1989), Nancy Paterson.[296]

Viewers ride a 1950s' bicycle in order to explore a video landscape. Viewers can alter the direction and speed as part of their interactive experience.



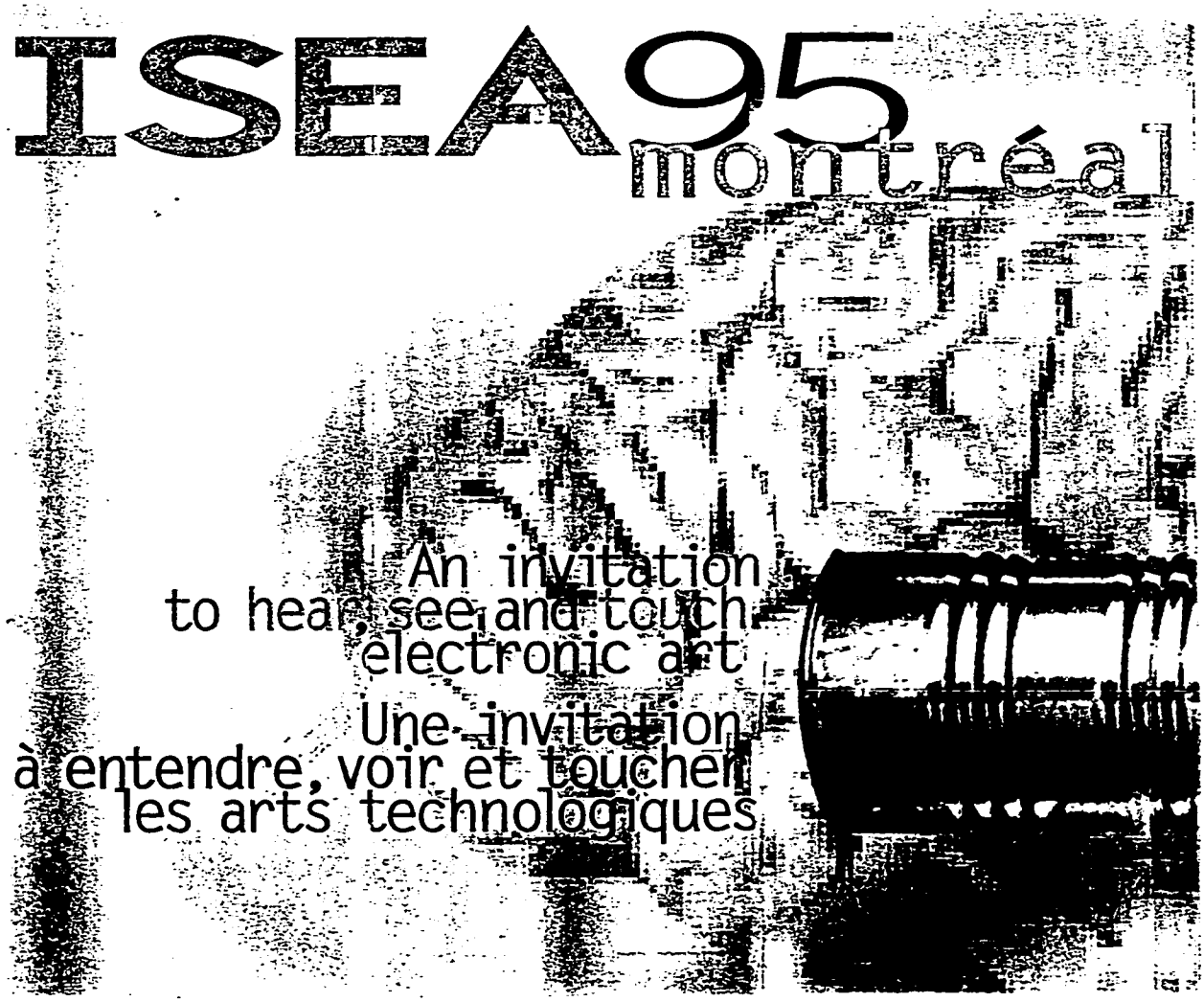
[296] Marchessault, 27.

Illustration 65: Nose Against Glass (1988), interactive performance by George Lewis and Don Ritter.[297]

George Lewis improvised on the saxophone while Ritter's interactive software system--"Orpheus"--used the characteristics of these sounds to affect qualities in the video imagery presented. (A specific musical sequence created the burst of hands in the image below.) Interactive control was in the hands of Lewis (not the average "viewer") and was witnessed by a seated audience.

[297] Farah, "Machines in the Garden," 50.

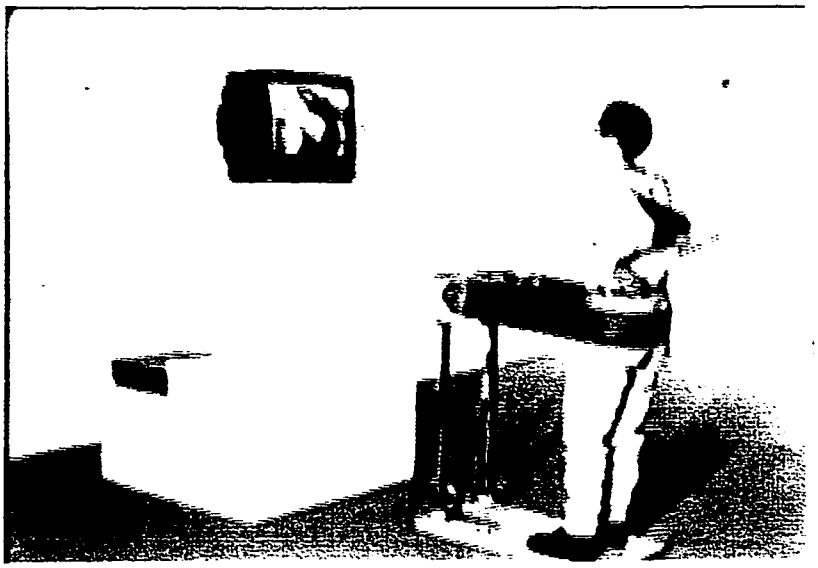
Illustration 66: Detail of poster design for ISEA 1995 (the sixth International Symposium on Electronic Art). The symposium was held in Montreal between Sept 17 and 24.[298]




[298] Poster courtesy of ISEA administration: 307 St. Catherine Sreet West, #310, Montreal, Canada.

Illustration 67: Ex(or)cisor (1993-1994), by Nancy Paterson.[299]

This is an example of the rudimentary "on/off" electronically interactive classification. Viewers stand within the Ex(or)cisor, turn on the machine and have their hips shaken while they watch video imagery of exercise classes.

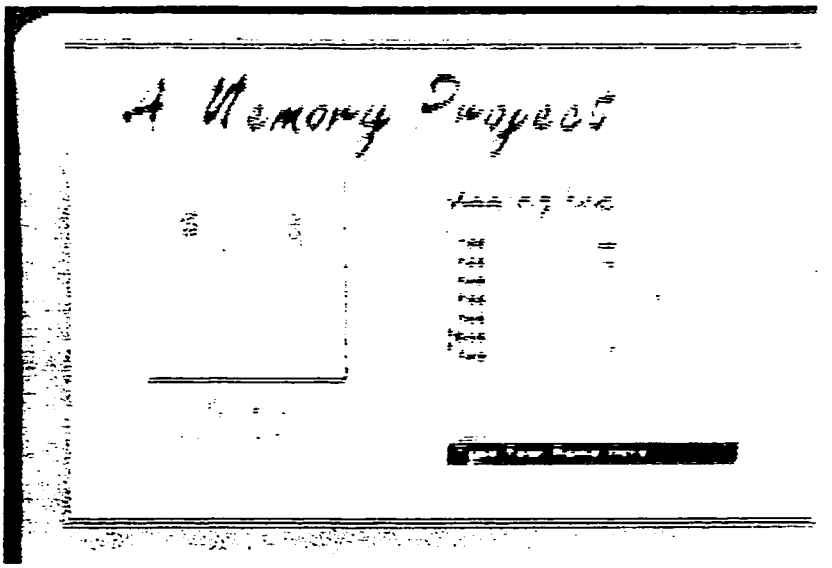


[299] Paterson, Interactive Installations, 1995, videocassette. Segment "Ex(or)cisor."

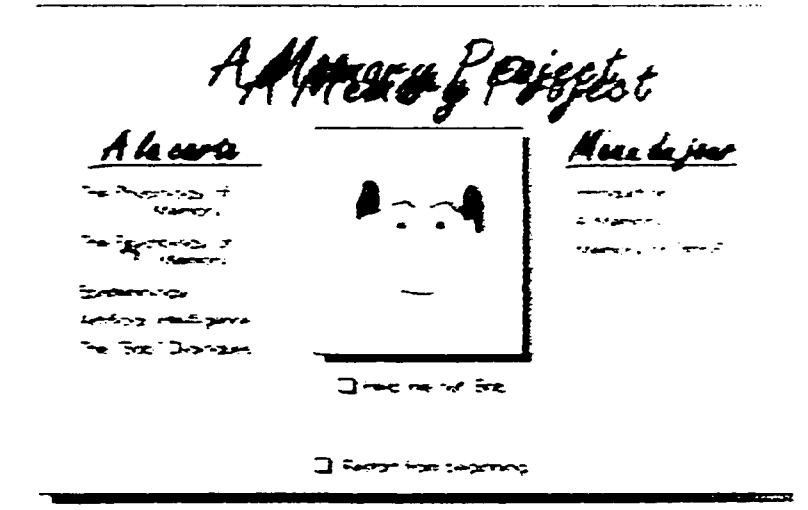
Illustrations 68a and 68b (of 68a to 68d): A Memory Project (1991), Henry See.

From the menus presented, a viewer, seated in front of a computer, uses a pointer "mouse" to explore the concept of memory.[300]

a



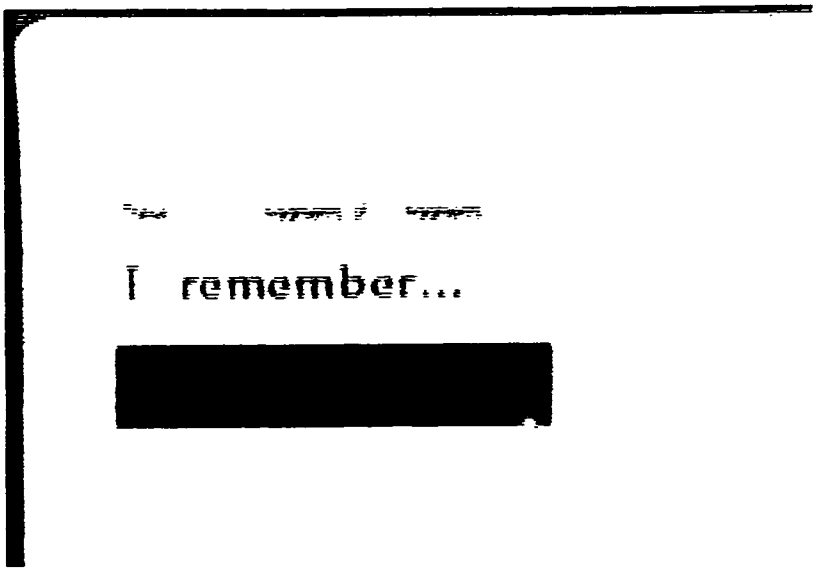
b



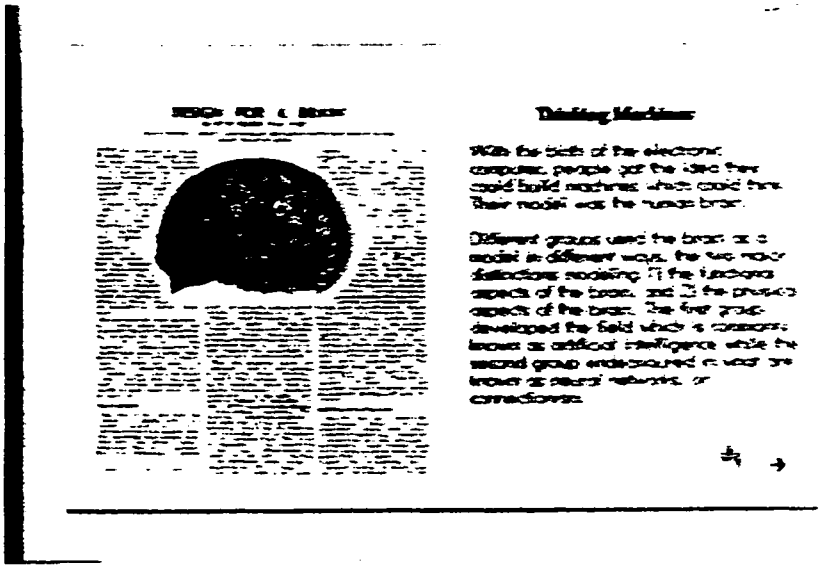
[300] Diamond, videocassette. Segment "A Memory Project - Henry See." A Memory Project was first shown at Printemps in Montreal in May 1991, then SIGGRAPH in 1992 and at TISEA (Third International Symposium of Electronic Art) at the Art Gallery of New South Wales, Sydney, Australia, in November 1992. (See, electronic mail.)

Illustrations 68c and 68d (of 68a to 68d): A Memory Project (1991), Henry See.[301]

c




d



[301] Diamond, videocassette. Segment "A Memory Project - Henry See."

Illustration 69: Kaferlein (Little Beetle) (1992), interactive installation, Mona Sarkis.[302]

When viewers push buttons on a mirrorized panel, they trigger the sounding of various German phrases. Between the buttons are graphed representations of the corresponding spoken words.

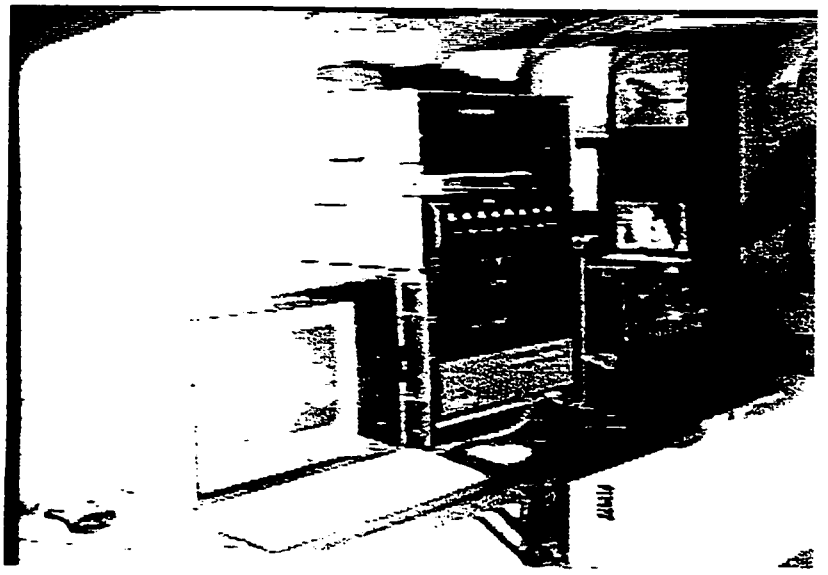
[302] Diamond, videocassette. Segment "Kaferlein (Little Beetle) - Mona Sarkis."

Illustrations 70a and 70b (of 70a to 70g): Sky Harp (circa 1990), Kristi Allik and Robert Mulder.[303]

70a and 70b: A video camera records the movements of a nearby tree which is analysed by Mulder and Allik's computer system.

a

b

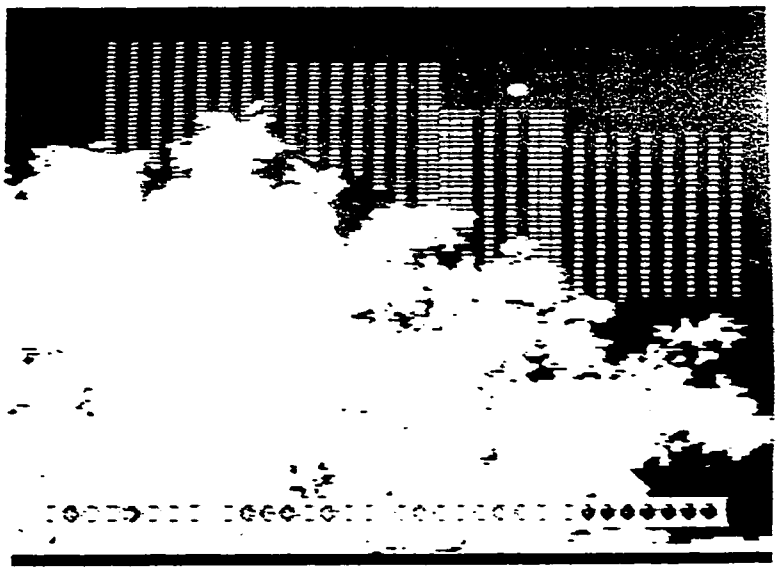


[303] Allik and Mulder, videocassette.

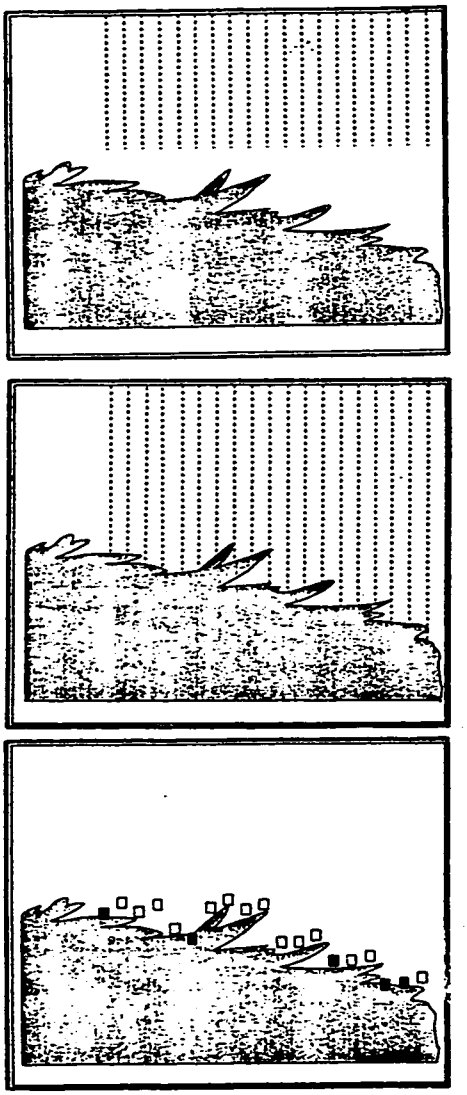
Illustrations 70c and 70d (of 70a to 70g): Sky Harp.

70c: Sensors use the outline of the tree to generate information that will be sent to the sound-generating site.[304]

70d: This tryptich schematically shows how the information is generated from the tree's outline. Allik and Mulder report: (a) "The system scouts for possible objects that are currently within the field of vision of the camera. (b) The sensors have detected the outline of the tree and have stopped their downward path. (c) The sensors have depositied 'keys' on the boundary outline of the tree. Black 'keys' indicate a note ON command. White 'keys' (currently inactive) are sending a note OFF command."[305]



c



d

[304] Allik and Mulder, "Sky Harp - Eulogy for an Elm Tree", videocassette.

[305] Kristi A. Allik and Robert C.F. Mulder, "*Skyharp*: An Interactive Electroacoustic Instrument", Leonardo Music Journal, 3 (1993): 5.

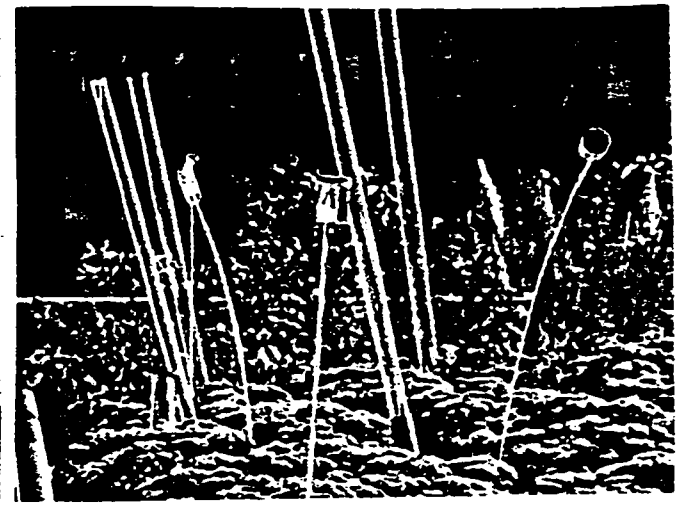
Illustrations 70e, 70f and 70g (of 70a to 70g): Sky Harp has been used in sound installations such as Eulogy for an Elm Tree and Skyline Variations.

70e: In the sound installation Eulogy for an Elm Tree, computer data was sent to speakers in hollow plastic tubes located in a meadow. Sounds emitted by speakers within, were altered according to the material, width and length of these tubes.[306]

70f and 70g: In the work Skyline Variations, the Skyharp system created a melody of bell-like sounds within a metropolitan Toronto park as part of the Glen Gould Conference in September 1992.[307]

e

f



g

[306] Allik and Mulder, "Sky Harp - Eulogy for an Elm Tree", videocassette.

[307] Allik and Mulder, "*Skyharp*: An Interactive Electroacoustic Instrument", 7.

Illustration 71: Responsive Linking Piece No. 1 (1980), an "interactive artificial intelligence installation" by Stephen Wilson.

Wilson states that the "participant converses with computer via a computer terminal. Each element of the video image [on the left] reflects the sense of the participant's answer to personal questions."[308]

[308] Wilson, "Artificial Intelligence and the Arts", figure 8.

Illustrations 72 and 73: Reflection holograms.

72: Vers la Flamme (87 exposures), 12 x 16" (1991), Shu-Min Lin.

73: Rudie, 20 x 24" (1989), Ana Maria Nicholson.[309]

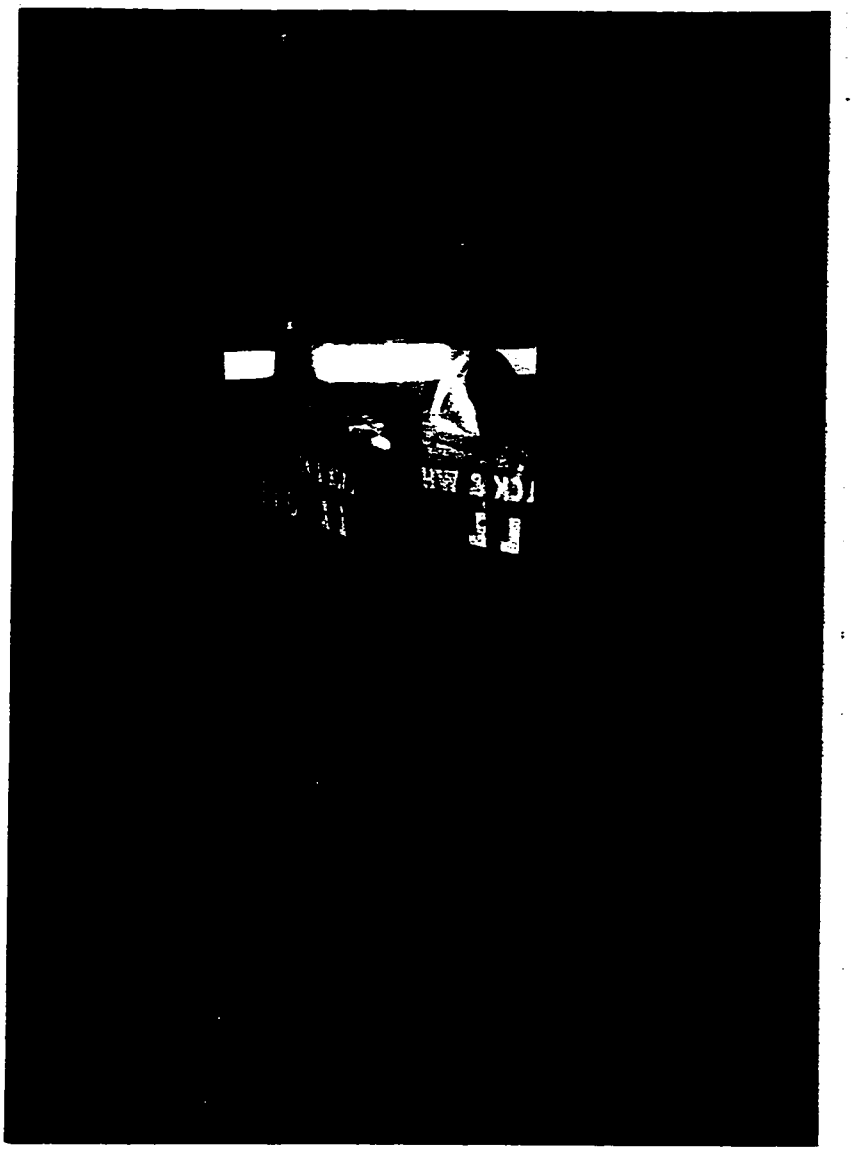
72

73

[309] Major and Fischer, Images du Futur 1993, 24 and 31.

Illustration 74: Bad Trick (1989), Roland Brener (Johannesburg, South Africa). Components: plastic, copper, bronze, ceramic, motion detector, electronic components, wiring, audio cassette, light bulbs.[310]

Bad Trick is an example of the "on/off" sub-category. As viewers approach the work, a motion detector triggers the piece to operate; a small skeletal face made of plastic parts starts to move in time with dialogue about the overdue status of the viewer's bills.



[310] Photographed at the National Gallery of Canada, May 13, 1995, by the author.

Illustration 75a (of 75a to 75d): Interactive Plant Growing (1993), Laurent Mignonneau and Christa Sommerer.

This is an example of the cocreator classification system; as viewers make contact with plants in the installation, virtual plants on the video screen ahead grow in real time.

75a: Plants are arranged on pedestals in front of a video projection screen.[311]

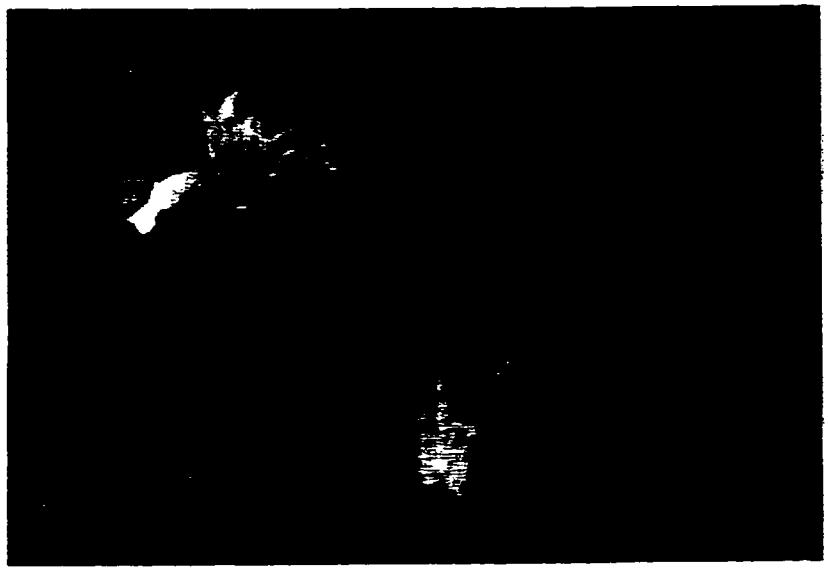
a

[311] Major and Fischer, Images du Futur 1995, 30.

Illustrations 75b and 75c (of 75a to 75d): Interactive Plant Growing (1993), Laurent Mignonneau and Christa Sommerer.

75b and 75c: Depending on how visitors touch different plants (shown in the upper-left), unique virtual plants are created in real time and are combined in the video projection.

b

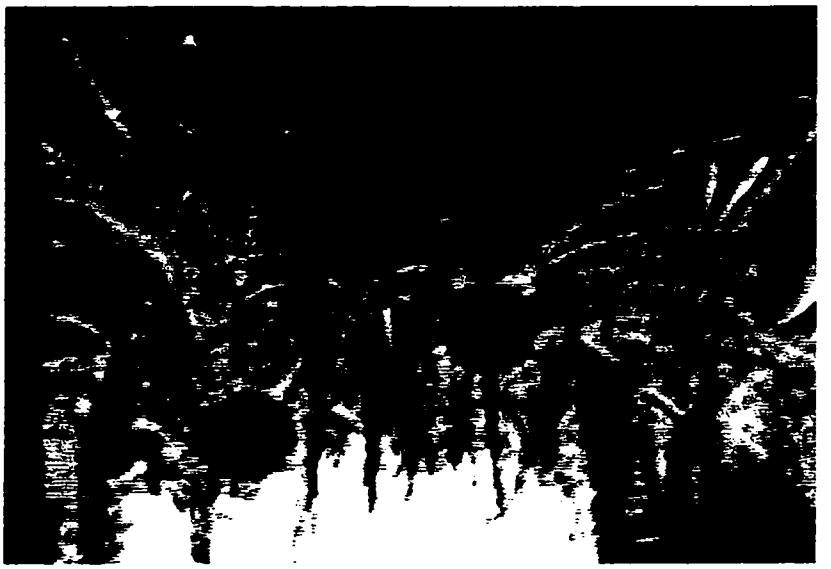


c

Illustration 75d (of 75a to 75d): Interactive Plant Growing (1993), Laurent Mignonneau and Christa Sommerer.

75d: Touching a cactus plant initiates a clearing of the screen; small black circles slowly grow in size erasing the viewer-made compositions.[312]

d



[312] Diamond, videocassette. Segment "Interactive Plant Growing - Laurent Mignonneau and Christa Sommerer."

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