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**MULTIMEDIA THEN AND NOW:
TODAY'S DIGITAL FORM AND PAST ARTISTIC CONCEPTS**

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in
The Department
of
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ABSTRACT

Multimedia Then and Now: Today's Digital Form and Past Artistic Concepts

Katherine Liberovskaya

Challenging the widely popular techno-centric and progress-oriented perspective which presents current New Media as the unprecedented model achievements of the Digital Revolution's scientific and engineering technological advances, this study argues that the new digital media are no less the continuity of a convergence of ideas evolving as much in the sciences as in the humanities and arts since the end of the Enlightenment. It proposes to re-think new media and their development via their interdependence with other fields of academic, scientific and artistic inquiry and through a media-archeological re-visitation of the past approach which emphasizes cyclical recurrence. Focusing on the intersection of the New Media with the world of (Western) Art, the study explores the reputedly new digital form referred to by "multimedia" today, as to its unprecedented nature in relation to artistic practice(s) and conceptions of Art as we are used to imagining them. The analysis is two-fold. The first part traces the origins of "multimedia" in avant-garde practices and visions of synthesis, from Western art history since Wagner, which resonate and dialogue with present ideas of synergy. The second part examines some recent art practices considered as "multimedia" -- projects on CD-ROM -- as to if and how they continue the aesthetic concepts outlined in the first section, as well as to the presence of any new dimensions specifically due to computerization. As it recontextualizes digital multimedia within a much broader frame of reference, this study presents new directions for alternative critical approaches to today's New Media that offer some balance by standing in contrast to the prevailing digital hype.

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"All the arts are brothers: each is a light unto the other"

Voltaire

Many assert that the New Media of the current Information Age are dramatically changing all but every imaginable facet of our lives. Over the past decade, these media have become an extremely hot topic. As they spread across the world, and as discussions about them multiply, the prevailing viewpoint presents these "value-free" technologies as humanity's greatest breakthrough since the invention of the printing press and as marking the planet's "global" "progress" into the second millennium. This widespread techno-centric angle seems to situate the origin and merit of the New Media in the isolation of the most advanced scientific and engineering technological research of recent times; and it contemplates their reach in terms of the virtues of computerization. There are, however, in my view, more interesting positions from which to consider the New Media, ones enabling us to grasp their diverse implications with greater complexity.

Indeed, while I do not in any way deny the impact these products of today's Digital Revolution have on our world as a whole, I would argue that the New Media are no less the incarnation of a general epistemological shift of Western human consciousness, of its "imaginary", as they are themselves the agents of transformation. From such a perspective they may be seen as the technical counter-part, the continuity, of a convergence of ideas and manifestations flourishing as much in the sciences as in the humanities and fine arts of the Western world since the end of the Enlightenment (not to

mention those of other cultures and periods). It would then make sense to maintain that every field of academic, scientific or artistic inquiry and its development can offer us a noteworthy viewpoint for understanding and analyzing today's New Media; and, at the same time, the analysis of the said media themselves and of their applications can bring new insight into the concepts and mutations of any given field. Media and ideas can thus be considered in relationships of complex interdependence. Focusing on this interdependence, on these relationships, can provide a valid alternative approach for thinking through and evaluating the extent of the influence of the Digital Revolution on our lives, and on how we imagine our reality.

Being, since the mid 1980s, an adept practitioner of electronic and digital media arts, I am especially interested by the said new forms of creative or artistic expression fostered by the fast-paced development of the realm of computer technology, and by their various implications for artistic practice. Thus, it is the particular relationship between the current "New Media" and the field of "Art" as defined by the Western cultural tradition that I propose to explore in this study. A location I find most interesting for the investigation of this intersection is today's "multimedia".

A recent fashionable buzzword in the present hype of digitization, "multimedia" is, in actuality, a nebulous term representing for some a type of media, for others a type of technology, for others still a form of expression. As I enter "multimedia" and "definition" into one of the search engines of my Internet browser, I find that "it is a new way to communicate. It involves creating synergy between sound, images and text" ([A Brief History of Multimedia](#), On-line). Such a definition leaves me considerably perplexed, for the term "multi-media" (with a hyphen), as well as variations such as intermedia and mixed-media, have been used, at least in the Western art

world, for several decades; and it can be argued that ideas of synergy between various art forms have been around since humans have walked the Earth.

Today "multimedia", which is often also called hypermedia, has generally come to mean the "unprecedented" multisensory convergence of visual, audio and textual material in an interactive computer-generated environment. This convergence can take the form of any combination of some or all of the following: ordinary text, hypertext, imported or computer-generated two-dimensional graphics, three-dimensional computer graphics, computer animation, "movies" (digitized video or film), music, voice, and sound effects. It is sometimes referred to in terms of container, sometimes in terms of content. For the moment, it includes works stored and distributed on CD-ROM disks - though DVD is expected to rapidly become the newer, "better" alternative - as well as projects distributed via, or made specifically for, the World Wide Web.

This current accepted understanding of multimedia leaves me intrigued about its connections to diverse anterior artistic practices and visions of multi-sensory synergy, or synthesis, notably those of the avant-gardes of the Industrial Revolution, and about whether computerization has brought any particular unprecedented dimensions to such practices and visions. Thus, the central question I propose to answer in the present study is: "does the current Digital Age understanding of *multimedia* present any "new" dimensions for artistic practice(s) and conceptions of Art?".

The particular aspect of multimedia that most interests me here, then, is its essence, not in the Heideggerian sense of mode of human existence, but essence in terms of the idea of synergy, as multisensory and multidimensional approach to understanding and expression, inscribing and inscribed by a worldview, and the deep structure of this idea. "Multimedia", is

thus understood not as a media form, digital tool or technological artifact, but rather as a contextualized practice and a site, a location, of interconnection, an articulation of a convergence of elements and properties coming from a variety of simultaneous sources -- technological, socio-political, historical, psychological, etc.. However, for the purposes of this study, I will focus on elements related to the field of Fine Arts.

This view of media is derived from a general base of theoretical conceptions of media and technology within communication and media studies, a base which posits, as Carolyn Marvin (1988) explains, that "media are not fixed natural objects; they have no natural edges. They are constructed complexes of habits, beliefs, and procedures embedded in elaborate cultural codes of communication" (p. 8). As it opens up the boundaries of media and technological artifacts, such a view redefines them as identities articulated in interconnection such that context is also constitutive, as Jennifer Daryl Slack (1989) states. Slack thinks of technology in general as articulation. "What technology is - she says - its definition and identity, is a non-necessary set of specific connections formed in the conjuncture of other social forces, practices, identities, and ideologies" (p. 336). Such a conception seems to me particularly well-suited for the vague entity that today's "multimedia" appears to be, and it is most useful for the purposes of my study, even if it stems from preoccupations more socio-politically oriented than my own.

My approach to the subject is inspired by one suggested by Finnish independent media scholar Erkki Huhtamo, in an article entitled "From Kaleidoscomaniac to Cybernerd: Notes Toward an Archeology of Media" in the 1996 volume Electronic Culture edited by Timothy Druckrey. He refers to this approach as "media archeology". According to Huhtamo, who shares

Marvin's view of media as having no fixed edges, this approach has two main goals:

First, the study of the cyclically recurring elements and motives underlying and guiding the development of media culture. Second, the "excavation" of the ways in which these discursive traditions and formulations have been "imprinted" on specific media machines and systems in different historical contexts, contributing to their identity in terms of socially and ideologically specific webs of signification. This kind of approach emphasizes cyclical rather than chronological development, recurrence rather than unique innovation. In doing so it runs counter to the customary way of thinking about technology in terms of constant progress, proceeding from one technological breakthrough to another, and making earlier machines and applications obsolete along the way. The aim of the media archeological approach is not to negate the "reality" of technological development, but rather to offer some balance by placing it within a wider and more multifaceted social and cultural frame of reference. (p. 303)

This anti-teleological and anti-technological-determinist approach, proposes that we think of archeology as a way to examine not only the past, but also the present and even the future, as, in the words of Huhtamo, "a mediator and 'meaning processor' operating between the present and the past (and arguably, the future)" (1996, p. 299). Archeology thus becomes a way of uncovering, yet cross-associating at the same time, the different resonant layers of which given media or technologies are interdependently composed. Historical contexts and different "histories" then appear as merely some of many other meaningful layers that intersect with each other to form the

complex fabric of the occurrence of media and technological phenomena. This perspective has much in common with Carolyn Marvin's. Marvin (1988) asserts that:

New Media, broadly understood to include the use of new communications technology for old or new purposes, new ways of using old technologies, and, in principle, all other possibilities for the exchange of social meaning, are always introduced into a pattern of tension created by the coexistence of old and new, which is far richer than any single medium that becomes a focus of interest because it is novel. (p.8)

Both Marvin and Huhtamo share a preoccupation with a wider and more multifaceted frame of reference for the study of media where the old and the new could coexist simultaneously.

Drawing upon these theoretical frameworks, my intention here is to re-think today's understanding of multimedia. The latter is not considered as a media form or a technological artifact, but rather as a tangible technological manifestation (I would say material, but the materiality of all things digital is contestable) of ideas from a variety of fields and sources; as the location of their interconnection and convergence; as a site of articulation between the past, the present and anticipations of the future. I question the seemingly systematic claims to unprecedented innovation that surround thinking about multimedia, as well as the current prevailing view of technology as neutral and as deterministic of human evolution. Limiting my focus to multimedia's relationship with the field of Art (as defined by the Western tradition) for the purposes of this study, I will thus attempt to create a dynamic dialogue between past and present, connecting ideas with technological developments, resources and realities, in a discussion where the archeological component

will serve as one of the intersecting elements emphasizing recurrence, parallelism and correspondence rather than chronological progress. To do this, I will re-visit a number of Western avant-garde artistic concepts and visions that, in my view, could be considered as essential components of the intellectual heritage of today's digital multimedia; further, I will examine a series of recent artworks exploring the "new form" as to if and how they continue the previously explored aesthetic concepts, and/or any others, as well as to the presence of any innovative dimensions specifically brought on by computerization.

My study will be two-fold. In the first part, entitled "Multimedia of the Machine Age: an Archaeological Survey of Multimedia Through Avant Garde Movements in Western Art", I will seek to trace the artistic component of the intellectual heritage of the concept of multimedia – of the idea of synthesis, of creating synergy between sound, image and text – within the field of Western Art history. By piecing together a general panoramic overview examining the innovative techniques and devices developed by the predominantly European avant-garde movements of the Machine Age, from Wagner, Futurism, Cubism and Constructivism to Dada, Surrealism, the Bauhaus and John Cage, movements which I consider of importance for the idea of synthesis, I will try to show how multimedia can be seen as the digital embodiment of ideas which have been evolving in the (Western) fine arts for over a century, rather than as simply the product of the current Technological Revolution. For this section, I will use a variety of Art and Art History books and texts addressing the origins of the practices and visions elaborated by these movements, from the end of the nineteenth century to the present, with a preference given, when possible, to texts written by the artists themselves. Their accounts of intentions, events and developments remain

sources of first-hand information, compared to the often synthesized data of works by Art historians and critics.

The second part, entitled "Multimedia of the Digital Age: a Virtual Synthesis of the Old and the New", will focus on what is today referred to by "multimedia". Part Two will question the claims that this digital form represents "unprecedented innovation". Multimedia is reputed to be a new medium in its own right, a medium "that opens up such exciting possibilities for radically new ways to communicate ideas, information and entertainment" (Cotton & Olivier, 1993, p. 8). To question this conception of "unprecedented innovation", I will use case studies of five current multimedia works. These were selected among some of my favorite multimedia titles that were specifically meant as art projects. This choice has been made because I consider that such endeavors tend to explore digital multimedia as an emerging expressive form much more so than do many of the various consumer products currently out on the market. Though both web-based works and works stored on CD-ROM are considered to belong to the digital multimedia category, I have opted to concentrate exclusively on the latter because of the CD's vast storage capabilities that seem to enable and yield more elaborate and complex projects. The five particular works selected – Puppet Motel, Mauve Desert, Cyberflesh Girlmonster, Ceremony of Innocence and Immemory – were chosen, not only because of their interest and success as artworks, but also because of the diversity of the backgrounds of their makers. Through my exploration I will try to see if and how each of these pieces can be seen as a continuation, or recurrence, of ideas and approaches laid out in the first section of this study, or as belonging to still other aesthetic traditions. I will consider to what extent, if any, they exhibit

completely new tendencies made possible by some of the intrinsic properties of the digital and electronic technology they use.

Such an analysis, as it provides some answers to the central interrogation of this thesis – an interrogation as to the "newness" of the current digital era understanding of multimedia for artistic practice(s) and conceptions of Art – will suggest some of the many ways in which multimedia is "embedded in the complex discursive fabrics and patterns reigning in [our] culture" (Huhtamo, 1996, p. 299). The analysis can thus serve as an example of something which in my view is greatly needed – new directions for alternative critical approaches to the currently so popular and mystifying New Media which are ever more rapidly extending to nearly every corner of contemporary life.

PART ONE

MULTIMEDIA OF THE MACHINE AGE: AN ARCHEOLOGICAL SURVEY OF MULTIMEDIA THROUGH AVANT GARDE MOVEMENTS IN WESTERN ART

Emerging as a commonplace locution with the frenzy of excitement surrounding computerization's virtues and "ground-breaking innovation" possibilities of the 1990's, "multimedia" is currently regarded by general public and specialist opinion alike as a "new", "unprecedented", way of communicating. It is reputed to "finally begin to merge together into a medium that better approximates real-life experience": text, graphics, sound, motion, video/ film, animation, and interactivity -- in an integrated way, via the personal computer -- as someone wrote on the World Wide Web (A Brief History of Multimedia, On-line). This "new form" is rapidly becoming a must, as much in the corporate domain, as in the art world. Yet, all the hype surrounding it does not cease to surprise me, for, as an artist and art lover, I have known of the existence of the term multimedia, or more precisely multi-media with a hyphen, as well as of the idea of integration or synthesis of several media, at least in the Western Art World, ever since the beginning of my curiosity for the Fine Arts over thirty years ago. In fact, even the 1975 Revised Edition of the Random House College Dictionary, which I have owned since high-school, lists multi-media, defining it as "the simultaneous, combined use of several media at once, as films, slides, flashing lights, and

music", a form of happening I have had the opportunity of seeing on numerous occasions at contemporary art venues around the world in pre-digital times. Because of the striking similarity between this older connotation of multi-media and recent definitions of multimedia, I became particularly interested in the inspiration behind today's so-called new form, in its origins.

To my surprise, within the proliferation of recent literature on the New Media, multimedia comes across as a phenomenon born of the current Digital Revolution, a phenomena with no history outside of the realm of computer science and engineering. Indeed, while recent publications praising its virtues and predicting its future potential abound¹, and while some relate

¹ "[A]n expressive medium unlike any other we have experienced before: an expressive and ubiquitous medium giving sensory form and human meaning to the ever growing, invisible world of digital electronics which increasingly permeates every aspect of our lives."(Cotton & Olivier, 1993, p. 8)

"These combinations of digital sounds and images engage their audience in a revolutionary new way: viewers can make choices, react, experiment, ask questions, and invent solutions; they can interact and influence what they are watching." (Cotton & Olivier, 1993, inside front cover)

"Hypermedia marks the beginning of the adoption and exploitation of the computer as a medium, rather than simply as a tool. [...] The computer is no longer just a computer, it is a "hypermedium", generating a revolution in media that is happening at this minute. Hypermedia is likely to have profound implications affecting every aspect of our lives. For the interactions of people from all over the world, both a users and creators of hypermedia applications and networks, will be a major force in redefining our knowledge of ourselves and the world we live in." (Cotton & Olivier, 1993, p. 41)

"The impact of multimedia upon our conception of what can be achieved in the realm of of art cannot be underestimated. For the artist, working with multimedia is different from preceding forms of art-making. Computer multimedia platforms and software offer us a virtual set of media tools and what we produce with them and the way that we use them can become uniquely their own. [...] Artists, for the first time, can begin to bring together fragments of all things. The unique potential of multimedia is that it brings together a full orchestra of powerful communication instruments within one

in detail the technological development of its current basic components, such as hypertext or the graphical user interface, scarcely any texts seem to address the derivation of the concept of multimedia *per se* - the intellectual heritage of this idea of fusion of several different art forms into a single form. This trend made me turn my attention to the world of Western Art History, where I had first encountered the notion, in an attempt to trace its evolution. There - throughout various classical and contemporary texts - I found numerous possible theoretical and practical antecedents for the concept in tendencies and movements of different eras.

In this first part of my study, I will therefore examine what I consider to be key developments in the history of the Western arts, in an attempt to point out, if not their influence on the evolution of multimedia as we know it today, at least the parallelism of their ideas with the reputedly "revolutionary" technological concepts which are said to have shaped the form. Though the concept of multimedia can be traced back to antiquity with its very first models of fusion of different art forms (storytelling and music, music and dancing, and particularly the various amalgamations of theatrical models...), I have chosen to focus my attention on the extremely eventful period situated between the middle of the nineteenth and the middle of the twentieth centuries, a period marked by the technological discoveries of the Industrial Revolution. This pre-digital era, inclusive of pre-electronic and even pre-electric eras, comprising the end of the Enlightenment and the

platform (onto one stage). [...] Multimedia becomes an interdependent element of our thinking with no clearly identifiable barriers between any of its elements. [...] This omniana, where the user stops thinking about the range of media and starts to deal with the interrelated fragments of all things as one interdependent realm within which to work. Thus can multimedia software be used as a single instrument at the disposal of the artist to create meaning and communicate. This is what I call omniana." (Diggle, 1997, pp. 117-119)

beginning of Modernism, is often referred to as the Machine Age. Through a media archeological excavation process driven by my quest for the precursors of the present understanding of multimedia, I have selected, among numerous possible others, the particular moments, individuals and thematics from this period that seemed the most appropriate for the purposes of my analysis. I have thus opted to begin my overview in Europe with Richard Wagner's *Gesamtkunstwerk* as well as with the Symbolist movement, both still built on Renaissance traditions. My investigation continues with the radical shift in perspective of the Futurists, Cubists and Constructivists and of the unique approach of Wassily Kandinsky. I further proceed with the antiart tactics of the Dadaist and Surrealist movements as well as the singular ideas of Marcel Duchamp. I then move on to the Bauhaus experiment's ideal of a new Art/Technology unity. I conclude with the important influence of American composer John Cage on recent art and thought. By means of such an archeological survey, I hope to shed some light on the genesis of the concept of multimedia, and to show that the form we know today is, rather than being merely a product of the current Digital Revolution, no less the digital incarnation of ideas which have been evolving in the arts, among other fields, for over a century.

The Renaissance's Legacy

Since the Renaissance a certain idea of synthesis of the arts -- mostly associated with the stage and especially opera -- had developed through an attempt to revive the form of Greek tragedy. Its practitioners, however, all

composers, from Gluck to Mozart, and Beethoven to Weber, considered the balance of its juxtaposition of poetry, music and stage action from an interest heavily weighted toward music. Concomitantly, there was a desire for a genuine synthesis among writers and poets including Lessing, Herder, the Romantics Tieck, Wackenroder, Novalis, Brentano, Hoffman and Runge, as well as philosopher Schelling, all of whom theorized on various combinations of the arts -- with reference to their specific limitations -- without putting their ideas into practice. But it was Wagner who, being at the same time a composer, a poet (writing his own librettos) and a theorist (producing a large body of writing drawing freely from his predecessors including philosophers Feuerbach and Schopenhauer), channeled the two major streams of experimentation -- the musical- practical on the one hand, and the literary-theoretical on the other -- into one, thus proposing an operative model of synthesis.

Wagner's theoretical and practical philosophy of musical drama can be summarized by the concept of *Gesamtkunstwerk*, or universal, total, artwork. He felt that "[t]he error in the art-genre of opera consists herein: that a Means of Expression (Music) has been made the object, while the object of expression (the Drama) has been made the means" (Goldman & Sprinchorn, 1964); and he proposed, in his opera work and numerous theoretical texts (especially "The Art Work of the Future", 1849), a new relationship between music and drama where everything should be at the service of the drama rather than driven by purely musical reasons. According to Wagner, every art reached fulfillment in a union with the other arts, and while music was, in his view, the most powerful organ of expression, it was unable to specify the feelings expressed, whereas poetry addressed itself to understanding. Thus, he believed, the two had to be unified to serve the higher drama of feeling,

raising the potential of each in combination. The result would then be, not opera in the old sense, but a "complete drama" that the other arts should further complement by the added dimensions of sight and gesture. His views have earned him the reputation of being one of the most visionary and headstrong composers of the last two centuries; and they have had considerable influence on many who have adapted various aspects of his musical style, from his own son Siegfried, to Debussy, to Vincent d'Indy and Alban Berg, to Carl Orff, Hugo Wolf and Scriabin, as well as the composer/poet tandems of Claudel with Milhaud, Cocteau with Honegger, and von Hofmannsthal with Strauss. During the same period, however, visions of synthesis and fusion were evolving in other art fields as well.

A development parallel to Wagner's, also influenced by Western artistic intentions derived from the Renaissance's rediscovery of the Greek civilization, and by the Renaissance view of the latter as an integrated totality, was the European Symbolist movement that spanned the nineteenth century and continued into the twentieth. First applied in 1886, in France, to Mallarmé and his literary group, the designation "symbolist" refers to an aesthetic which can be related: to a variety of writers, such as Verlaine, Rimbaud, Baudelaire and Claudel; to painters like Moreau or Redon; and to theater personalities such as Maeterlinck, Craig and Appia. The dominant characteristic of this aesthetic was an acceptance of the correspondences between the arts and between the information of the various senses, a concept of synaesthesia. A classic example of these views is Baudelaire's poem "Correspondences", in which perfumes, sounds and colors interblend. The Symbolist movement is considered to be one of the precursors of Surrealism, especially, as well as of other schools of twentieth century art. Along with the Postimpressionist painting movements, such as Fauvism and Cubism, it

established art as illusion, interpretation, and conception rather than as the imitation of objective reality which the arts of the Renaissance sought.

While Wagner and the Symbolists seem to have maintained the artistic traditions of the Renaissance by continuing to explore its established forms -- without responding, in any evident way, to the already widespread technological innovations of the Industrial Era -- their novel approaches laid the groundwork for the important revolutionary practices of ensuing art movements. Thus, Wagner's *Gesamtkunstwerk* inspired the "total theater" and "total art" visions of the twentieth century which I consider to be at the root of the concept of "multimedia". The Symbolist idea of synaesthetic correspondence, for its part, has been a recurrent theme in Modernism and Postmodernism, and has been one of the most significant metaphors for the development of electronic and digital multimedia technology. Subsequent artistic endeavors would be radically different from these still romantic visions by virtue of their direct interaction with the new spirit of the mechanical age.

The Spirit of the Machine Age

Out of the context of Symbolism, and in opposition to its principles, emerged, again in France, the figure of Alfred Jarry, with his satirical, grotesque, crude and scatological Ubu theater trilogy, the first part of which -- Ubu Roi -- with its opening line "Merdre" (from the French "merde", "shit", with an added "r") premiered in 1896 in Paris to a shocked public. This production, which represented an unprecedented provocative overthrow of nineteenth-century

conventions and of the ideal of realism, was to have a decisive influence on subsequent avant-garde performance and on art in general. One of Jarry's most evident and direct descendants can be considered the Futurist movement. Indeed, its founder Filippo Tommaso Marinetti, a young Italian poet, had lived from 1893 to 1896 in Paris, where he frequented the circle around the literary magazine La Plume - of which Jarry was a member. This circle introduced him to the concept of "free verse", a concept he soon made his own. Futurism originated with Marinetti's "Futurist Manifesto" of 1909, which he published in Le Figaro in Paris, and soon attracted numerous young Italian artists including: Carrà, Boccioni, Russollo and Balla. "Once organized, the movement intended to create art representing qualities and activities as various as speed, simultaneity, kinetic continuity, interaction of visible and invisible forces, changes in the environment, leaps in point of view, etc." (Kostelanetz, 1968, p. 11). To do this, the artists of this movement experimented with an extraordinary variety of materials, techniques, art forms and media.

Futurism represents a decisive break from preceding art movements. Indeed, though the major technological innovations of the Industrial Era - from daguerreotype to chronophotography - were rapidly gaining widespread popularity, the Symbolists, Impressionists and different Post-Impressionists, had been either repressing, or reacting negatively to, their influence. They did so by continuing to embrace traditional materials, practices and forms. The Futurists were the first to give themselves up to the spirit of the new Machine Age. Thus, from manifesto to manifesto, they explored the unprecedented changes brought on by the Industrial Revolution in many ways. Their paintings glorified the machine as a tool and the machine aesthetic as part of a style; their poetry recorded in print the abstract sounds of

everyday life and exploited various sizes of typography to create picture-poems; and they envisioned nonharmonic music that would conquer the infinite variety of noise-sounds. In addition, they posited a conflation of the arts into a single theatrical whole that would simultaneously exploit the new twentieth-century devices of electricity and cinema as well as poetry, scenery and props. They saw in the then new expressive medium of cinema the ideal instrument for a "polyexpressive" "new art":

Today the *Futurist Cinema* creates precisely the POLYEXPRESSIVE SYMPHONY that just a year ago we announced in our manifesto "Weights, Measures, and Prices of Artistic Genius." The most varied elements will enter into the Futurist film as expressive means: from the slice of life to the streak of color, from the conventional line to words-in-freedom, from chromatic and plastic music to music of objects. In other words it will be painting, architecture, sculpture, words-in-freedom, music of colors, lines, and forms, a jumble of objects and reality thrown together at random. We shall offer new inspirations for the researches of painters, which will tend to break out of the limits of the frame. We shall set in motion the words-in-freedom that smash the boundaries of literature as they march toward painting, music, noise-art, and throw a marvelous bridge between the word and the real object. (Marinetti, et al., 1973, p. 208)

Further, arguing for the primacy of vision over print, they attacked the founding convention of a literate society by proclaiming that this *Futurist Cinema* would eventually kill the book.

The Futurist spirit of innovation and rebellion spanned the years between the First and Second World Wars, attacking and integrating all possible outlets of art and technological innovations of the time, including

radio which was then emerging. At the same time, however, the other primary art tendency, Cubism, originating in painting experiments which moved into abstraction in rebuttal to the influence of the machine, was no less consequentially transforming artistic visions in an attempt to create images consonant with the integrated relationship between "what one sees and what one feels about what one sees".

The accepted origin of Cubism is situated in the late nineteenth century in France, with Paul Cézanne's move away from the vanishing point perspective, and the singular vision of the world that this implied, to a simultaneously multiple point of view. By integrating into a single two-dimensional field several objects as they could only be seen from different viewpoints - some from the front, others from the back, top or sides - Cézanne instigated a pictorial revolution through which a multiplicity of moments-in-time and perspectives came to life in a still rectangle. Part of the inspiration for this approach were the serialized, broken up, fractured images suggested by Marey, Muybridge and cinematography. Soon Braque, Picasso and others would, through their diverse Cubist creations, push Cézanne's technique even further in a movement out from the painting's frame into the third dimension of space, and eventually into the fourth of time. Margot Lovejoy relates one of Picasso's comments of the time to photographer Brassai:

Photography has arrived at a point where it is capable of liberating painting from all literature, from the anecdote, and even from the subject. In any case, a certain aspect of the subject now belongs in the domain of photography. So, shouldn't painters profit from their newly acquired liberty... to do other things? (1997, p. 36)

Thus, in 1912, Picasso introduced a new device by pasting a fragment of oil cloth onto a Cubist composition, Still Life with Chair Caning, around which he wrapped a piece of hemp in lieu of a frame. This device, coined *collage*, integrated foreign elements directly into a painting with adhesive.

Collage has become the central compositional technique, not only of twentieth century visual art, but also of its theater, music and literature. Out of the collage technique came "the movement of the picture out into space and its eventual merging into action and/or forms in the space-time continuum" (Harriet Janis and Rudi Blesh quoted in Kostelanetz, 1968, p. 16). Interestingly, many have noted (e.g. Berger, 1972, and Bronowski, 1978) the similarities between Cubist ideas and the "phase shift" in physics - a shift away from the Newtonian single universal frame of reference towards a new conception of space-time as relative to the observer - which Plank and Einstein signaled between 1900 and 1905.

In the meantime, the European avant garde movements were also leaving traces and fostering new important developments in Russia. Indeed, following the 1909 publication of Marinetti's first manifesto in Russian, Futurism was reinterpreted in the period's context of reaction against the old order of both the Czarist regime and the imported painting styles of Impressionism and early Cubism. Like the Futurists, younger artists were embracing the spirit of the new Machine Age, believing that the future of society lay in the beneficial, liberating forces of science, technology, and industry. But, following in the footsteps of the Russian avant garde of the 1890s, they were asserting a commitment to developing an essentially Russian art. Groups of writers and artists formed throughout the major cultural centers of St.-Petersburg, Moscow, Odessa and Kiev, and soon began organizing events consisting of unconventional combinations of debates,

with exhibitions and various presentations of poetry, theater, dance, music, and "home-movies". Among the prominent figures of this era were Tatlin, Lissitsky, Rodchenko, Gabo, Malevitch, Pevsner, the poet Mayakovsky and the film director Vertov. They sought to fuse art and life through an expanded approach to mass culture, performance and production/technology. "Let us make the streets our brushes, the squares our palette" proclaimed Mayakovsky (Goldberg, 1988, p. 41). They also devised their own version of collage, *photomontage*, to produce large posters and graphic works which could be reproduced and distributed with the means and speed of daily newspapers. From this period also stem Sergei Eisenstein's theories of film *montage* as an essential element of the grammar of the moving image. Eisenstein proposed that, via editing, new meanings could be created through juxtapositions of isolations, extensions, interruptions, enlargements and reductions.

The Constructivist dream for a fusion of the arts led to experimental explorations of the connections between theater, architecture, film and poetry in elaborate Agitprop public spectacles. Thus, by the 1920s, the momentum of innovation "[...] had brought just about every possible technique and style of painting, theater, circus and film into play. As such the limits of performance were endless: nowhere was there an attempt to classify or restrict the different disciplines. Constructivist artists committed to production art worked continuously on developing their notions of an art in real space, announcing the death of painting" (Goldberg, 1988, p. 44). Though Stalin's rise to power was to bring a rapid end to this intense experimentation in the arts, its spirit would live on and develop elsewhere, notably in Germany with the Bauhaus.

These first positive or negative artistic reactions to the new reality of the Machine Age introduced concepts and techniques that remain highly

influential for all forms of creative production to this day. The ideas of the Futurists have turned out to be extremely prophetic, notably their declaration of the death of the book, which strikingly announces the discourse of current fervent multimedia advocates. The Cubist technique of *collage* has been diversely re-thought and appropriated by a large part of the Western art tendencies of the twentieth century, and serves as perhaps the most important guiding principle for the aesthetic of mixing means and techniques of today's digital tools and products. Also important for current multimedia is the Constructivist example of layering different media for Agitprop propaganda, and the Constructivist theory of *montage*, as which replaces sequence by fragmentation, and which permits a fusion of space, time and illusion with reality. While all these new ideas were evolving and inspiring artists across Europe, Wassily Kandinsky was developing his own particular direction of artistic experimentation.

Wassily Kandinsky

Wassily Kandinsky elaborated his own vision of a fusion of the arts. Kandinsky was Russian, but studied painting in Germany, where he lived from 1896 to 1914 and returned to in 1921, and was thus linked as much to German Expressionism as to the Constructivists. While he developed a form of abstract painting based on musical principles of composition and harmony, and on the correspondence between music and color, he devoted considerable energy to theory. Kandinsky also had a significant interest in modern music, and was a friend and admirer of Arnold Schoenberg, who developed

atonality, serialism and his unique twelve tone method. Kandinsky imagined a total art form completely different from Wagner's *Gesamtkunstwerk*, and even composed some of his own stage pieces, which he termed "monumental art" -- pieces such as the 1909 Sonority in Yellow which he published in script form in the German art publication Blaue Reiter in 1912.

In Homage to Wassily Kandinsky, H. H. Stuckenschmidt explains that in his introduction to Sonority in Yellow, entitled "On Stage Composition", Kandinsky points out that "although the means of expression - sound, color, and language - are completely different in external nature, their inner deeper resemblances are recreated by the psyche as it apprehends them" (1975, p. 28). In this way, the piece "consists of three elements: the movement of musical sound, the movements of people and objects, which may be called physical-moral movements, and the movement of colors, the most scenic of all" (1975, p. 28). Kandinsky, he says, "insists on the fact that the three elements are subordinated to a common goal", and thus, "the music grows softer when it might overshadow one of the other kinds of movement, and language is used only to create an atmosphere, not for its semantic possibilities" (1975, p. 28). In his theoretical treatise, Concerning the Spiritual in Art and Painting in Particular (1912), Kandinsky describes the potential of "monumental art":

Shades of color, like those of sound, are of a much finer texture and awaken in the soul emotions too fine to be expressed in prose.

Certainly each tone will find some probable expression in words, but there will always be something left over, which the word fails to express and which yet is not supererogatory but the very kernel of its existence. For this reason words are, and will always remain, hints, mere suggestions of colors. In this impossibility of expressing color in words, with the consequent need for some other mode of expression,

lies the possibility of a monumental art. In this art, among innumerable rich and varied combinations, at least one is based on firm fact and is as follows: the same internal tone may be achieved by the different arts; each art will bring to this general tone its own special characteristics, thereby adding to it a richness and a power which no one art form could achieve. The immense possibilities of profundity and strength to be gained by combination or by discord between the various arts may be easily realized. (1947, pp. 63-64)

Thus, in his concern for the creation of a synthesis of all the arts, Kandinsky concentrated on the idea of a theater of "abstract scenic synthesis". Today, his visions seem to be digitally materialized by numerous abstract creative experiments, notably experiments in 2D and 3D computer animation, and in certain Virtual Reality "worlds". His theories on "monumental art" greatly resemble the discourse of current multimedia promoters. In his own time, however, Kandinsky was to have an indirect influence on a most unexpected approach to art: Dada.

Anti-Art

Around the time of the publication of "On Stage Composition" and Concerning the Spiritual in Art, Hugo Ball, a young man deeply involved in theater, and fascinated by Wagner's *Gesamtkunstwerk* concept, with his own ideas of a total artwork, briefly frequented Kandinsky's circle in Munich before establishing himself with his partner Emmy Hennings in Zurich. There, in 1916, the two opened a café-cabaret: the now legendary Cabaret

Voltaire. Through its artistic stage evenings made up of collaborative contributions, by, among others, the young Tzara, Janco, Huelsenbeck, Jean Arp and wife Sophie Taeuber, productions including live reading, dance, song, costumes, and masks – the Dada movement evolved. First through publications, and then through the Galerie Dada in Zurich, the movement established itself as a "tendency in art", centered on scandal, that was ready to question the very structure of art itself as well as its relationship to the art world and society as a whole. Via their outrageous performances, where they played their own "noise music" with "instruments" such as baby rattles and jangled keys or tin cans, and read and recited simultaneous poems and manifestos, the Dadaists, like the Futurists before them, wanted to incorporate the realities of modern life into art because they believed these could speak more loudly than any painting. Thus, in addition to their multi-dimensional stage productions, they elaborated a singular approach to typography inspired by the Futurist picture-poems, and they developed an entirely new kind of found-image composition through their experimentation with mechanical publication techniques. Dada *photomontage* consisted of collaged images taken directly from printed newspaper and magazine materials, a practice meant to outrage the public and destroy the aura or market value of their work by revealing it as appropriated reproductions. It was the first time that artists used collaged photoimagery and photo-mechanical methods as part of an artistic style. This technique - through which the awkward seams and joints from the collage procedure could be made invisible when the image was printed photomechanically - subsequently became a most common imaging process for the pre-digital press industry.

From Zurich, the movement spread to Berlin by way of Richard Huelsenbeck's relocation in the German capital. There, new forces joined the "Rebellion" -- figures including Kurt Schwitters who was famous for his all-encompassing multi-dimensional MERZ Theater. Through cross-country and European tours, local groups were formed across Germany as well as in Czechoslovakia, Rumania, and Holland. In the meantime, having remained in Zurich, Tzara made the acquaintance of the Parisian-born Cuban artist Francis Picabia. Picabia circulated Dada's ideas to Paris and New York, where he was, with his friend and colleague Marcel Duchamp, at the forefront of avant-garde activities. He also introduced these ideas in Barcelona. Soon, in 1919, Tzara was to join Picabia in Paris where, he would meet up with a group of young writers who founded the literary magazine Littérature.

The group in question included André Breton, Paul Eluard, Philippe Soupault, Louis Aragon, Pierre Reverdy, Jean Cocteau and many others. Cocteau had by then been active in avant-garde theater for several years. Together with Guillaume Apollinaire, and the enigmatic Erik Satie, Cocteau was part of a "New Spirit" exemplified by collective productions, such as Parade with Picasso, inspired by the irrationality of Alfred Jarry's pataphysics. He envisioned a new mixed-media genre for French performance, a "revolution which flings doors wide open [and which would allow] the new generation to continue its experiments in which the fantastic, the dance, acrobatics, mime, drama, satire, music and the spoken word combine" (Goldberg, 1988, p. 81). Supporters of both this "New Spirit" and Jarry-style scandal, the Littérature group members welcomed Tzara with enthusiasm, and eagerly participated in the organization of Paris's first outrageous Dada soirées. As these soirées evolved into large-scale events and festivals involving more and more people, the relations between Picabia, Tzara and

Breton grew strained and antagonistic, with each gradually moving in his own direction. Picabia produced the memorable ballet Relâche in 1924 with Satie, Duchamp, Man Ray and others, as well as the film Entr'acte, shot by René Clair showing during the interval. There "the author, the dancer, the acrobat, the screen, the stage, all the means of 'presenting a performance' [were] integrated and organized to achieve a total effect..." observed painter Fernand Léger (Goldberg, 1988, p. 95). Breton, for his part, published the Surrealist Manifesto in 1924, and formed with, among others, Eluard, Aragon, Péret and Soupault, the Bureau of Surrealist Research.

Already "obsessed with Freud" and with the examination of the subconscious by 1919, Breton attested in his manifesto to the project of "the future resolution of these two states, in appearance so contradictory, which are dream and reality, in a kind of absolute reality, *surreality* ..." (Kirby, 1969, p. XXIV). Believing in a "higher reality of certain hitherto neglected forms of association, in the omnipotence of the dream, in the disinterested play of thought" (Goldberg, 1988, p. 89), the Surrealists' early work consisted in the search for a "pure psychic automatism", through "automatic writing" which took the form of poems and "plays for reading". They also constructed texts from randomly assembled words and sentences cut out of newspapers, a technique meant to break down the conventions of linear organization. The painter Max Ernst, for his part, a former Dadaist, elaborated *frottage*, a non-collage system for incorporating found material, by placing a sheet of paper over randomly chosen objects and rubbing a pencil over them. The Surrealists, soon joined by more and more painters, such as Dali and Magritte, and film makers like Buñuel, further developed a compositional device for joining disparate images in non-logical juxtapositions in order to create a new reality (reminiscent of Comte de Lautréamont's famous

'possibility of a sewing machine and an umbrella meeting on a dissecting table' as well as some of Eisenstein's *montage* principles), and a distinctly new aesthetic syntax based on a "logic of simultaneous vision". This Surrealist form of collage introduced psychological studies into art, and permitted vast realms of the mind to become material for new visual and performance explorations.

From the Surrealist movement emerged Antonin Artaud, who, in The Theater and Its Double (published in 1938), invoked a nonrepresentational and nonliterary total theater which would reject the supremacy of speech and employ all the means of expression utilizable on the stage - dance, sounds, lighting, etc. - to create the informational context for a "very difficult and complex poetry" of the stage itself. Artaud considered each mode, each form of expression, as a language in itself, and his project of a total theater aimed "to create stages and perspectives from one language to the other" (Kirby, 1969, p. XXV).

In the meantime, a figure claimed by both the Dadaists and the Surrealists, the enigmatic Marcel Duchamp, who began as a Cubist, developed a philosophic domain of his own, beyond the confines of any movement. Feeling that the machine had formed modern consciousness, he questioned every assumption ever made about the function of art. Thus, he experimented with new manufactured materials and the iconography of the machine itself, with references to popular culture overlaid with allusions to Freudian thought. In 1913 he introduced his own version of "found" element composition, a bicycle wheel mounted on a stool, which he coined *ready made*. This work and subsequent ready made consisting of manufactured objects - such as a urinal or a coat rack - were widening the question the Dadaists raised by their photomontage practice as to reproducibility in relation

to the uniqueness of a work of art and as to the necessity of hand skills. Duchamp's appropriation of mass-produced machine-made objects and materials, as well as his use of various techniques of industrial manufacture, suggested the possibility for art-making to move away from its own identity as a form and to place the most important emphasis on the conceptual process.

While Dada stood for negation, "to destroy in order to build on the ruins", and Surrealism for an order of disorder which would exploit the resources of the unconscious, both questioned the very meaning of art in the face of what they saw as the alienating influence of industrialization, particularly mechanical reproduction. Through their antiart tactics they developed techniques that have become pivotal for postmodern art aesthetics, several of which can also be considered as the basis for many digital media general principles. Thus, the Dada and Surrealist found image photomontage techniques, as well as Duchamp's ready mades, are not only precursors for "quotation" - a dominant theme in contemporary art - but can also be seen as the central idea behind most present-day multimedia and imaging software, such as Director or Photoshop, where work is produced by processing infinitely reproducible material "imported", or appropriated, from foreign sources. By eliminating the necessity of hand skills, these tools systematize the essentially conceptual, process oriented approach which Duchamp called for. Concurrently, the Surrealist device for randomly creating prose from words and sentences cut out of newspapers can surely be viewed as an important inspiration for the "cut and paste" principle of electronic and digital word processing. In addition, the concept of simultaneous amalgamation of unrelated but coexisting events and/or levels of meaning that the Surrealists explored appears very similar, in essence, to the

intertextual idea of hypertext and hypermedia. At the same time, the project of the Web, a project that weaves verbal texts with those of non-verbal media tightly together into a series of networks and links that is never closed, seems to echo Artaud's proposition of a total theater creating stages and perspectives from one language to another. From this period would also emerge, in Germany, a very different perspective on total theater and art, with a no less noteworthy bearing on digital multimedia.

A Total Convergence of Art and Technology

While Breton and his colleagues were exploring Freud's theories and the subconscious, in Germany a unique teaching institution for the arts opened its doors in 1919: the Bauhaus. Unlike the rebellious Futurist and Dada provocations (considering these approaches to be structurally and stylistically arbitrary), in the climate of the divided and impoverished postwar Germany, Walter Gropius's Bauhaus Manifesto romantically called for the unification of all the arts in a "cathedral of Socialism" celebrating technology. This vision was much like the Russian Constructivist politico-artistic fusion ideal. Gropius was convinced of the need to create an art practice where the unity between artist, architect and craftsman could be achieved, by training such practitioners, as well as engineers, designers and theater people, to believe in a synthesis of the arts and in the beauty of progress. Thus, the school's first public exhibition, the 1923 Bauhaus Week, was mounted under the title Art and Technology - A New Unity. It declared the machine to be the most significant factor of the age. Involved with actual and theoretical work in

every field of artistic practice, the Bauhaus, located in the provincial town of Weimar, became a center for the development and propagation of a new European experiment in the arts. Attracting one of the most remarkable faculties in history, the institution assembled, among numerous others: Wassily Kandinsky, Paul Klee, Josef Albers, Johannes Itten, Herbert Bayer, Marcel Breuer, Oskar Schlemmer and Laszlo Moholy-Nagy. Their utopian dream was "to resolve the contradictions between an immediate, sensory experience of life and the hazy figure of the 'perfect technician' at the control panel of a future automated world-machine" (Forgàcs, 1995, p. 142). They called this "perfect technician" *the whole man*. The microcosm of the stage was the most suitable experimental field for their utopias, for it enabled at least the symbolic realization of ideas that could not be carried out in reality.

Gropius envisioned a "Total Theater" with "a great light-and-space keyboard, so impersonal and variable that it confines [the universal producer] nowhere and remains flexible to all visions of his imagination" (Kostelanetz, 1968, p. 13). Thus, the stage workshop, integrated into the sculpture workshop, led by Oskar Schlemmer, was considered a fundamental aspect of the interdisciplinary curriculum of the institution. The Bauhaus theater was essentially a dance theater in which Schlemmer's concept of Man as Dancer (*Tänzer Mensch*) was the focus for the transition to the absolute visual stage (*Schaubühne*). Through the school's basic principles of abstraction and mechanization, human performers tended to be dehumanized, hidden under the elaborate costumes and masks which they manipulated. These tendencies led, on the one hand, to marionette plays with wooden "actors" matrixed by character and place, and, on the other, to productions where physical effects dominated the action or took over completely, productions such as "light

plays" which combined human forms, shadow effects, and projection, or, such as Heinz Loew's model for a totally mechanical stage.

Concurrently, Moholy-Nagy, one of the institution's most influential and innovative faculty members, not only schooled his students in the use of photography, which he embraced as the foundation for a "new vision", but also focused their attention on optical experiments, and on the time/motion aspects of film as means for making art that would create a new "optical culture" born of a changed visual awareness. Thus, he called for "drawing with light" and "light in place of pigment". He rejected all hand-produced textures, arguing that they limited the artist in their emphasis on skill and genius which took away from the concept. In 1922, he even produced a series of *telephone pictures* which he had a factory execute by specifying the dimensions, positions and hues of individual pictorial elements on a grid over the telephone. He too prescribed a "theater of totality" as an extension of the Bauhaus principle of a "total art work", a "great dynamic-rhythmic process, which can compress the greatest clashing masses or accumulations of media - as qualitative and quantitative tensions - into elemental form" (Goldberg, 1988, p. 116.):

Nothing - quotes RoseLee Goldberg from his 1924 essay "Theater, Circus, Variety" in her Performance Art from Futurism to the Present - stands in the way of making use of complex APPARATUS such as film, automobile, lift, aeroplane, and other machinery, as well as optical instruments, reflecting equipment, and so on. (1988, pp. 116-17)

For such a process to be realized, Moholy-Nagy concluded that a "thousand-eyed NEW DIRECTOR, equipped with all the modern means of understanding and communication" was needed. His workshop's projects included a "score" for a "Mechanized Eccentric", a "synthesis of form, motion,

sound, light (color) and odor", where three stages arranged one above the other were to be used simultaneously for the appearance of moving arrows, spinning discs, "gigantic apparatus" and "mechanized men" against a rear projection of film and moving colored lights, to the accompaniment of mechanical instruments, sound effects and noisemakers (Kostelanetz, 1968, p. 13).

In 1932, the Bauhaus, which had moved from Weimar to Dessau in 1925, closed its doors due to internal problems as well as to censorship imposed by the new Prussian government. However, with the onset of the Second World War, many of its significant members were to emigrate to the United States, where their ideas would be instrumental in fostering new directions in the arts and would contribute to the pendulum shift of the international art world from Paris to New York.

While the Bauhaus experiment was a return to an aesthetic of pure form compared to the concerns of the anti-art movements, its idea of the artist's involvement in the technological innovations of mechanization and mass production was extremely progressive. In direct contradiction to the emphasis on traditional materials and hand-skills of the European art establishment of the twenties, it advocated the exploration of the various latest forms of technology, not as provocation like the Futurists, but as creative media. Thus, the Bauhaus provided a model for subsequent artistic research in new technologies, notably the postmodern experiments with electronics, video, holography and computers. Its ethic of collaboration between practitioners of various fields still prevails for numerous technological art projects. The Bauhaus total theater pre-figures current research in multimedia which, like the former in a pre-digital age, stands out as the most suitable experimental form for projects that cannot be realized in

reality. It is interesting to note that, in 1991, Brenda Laurel released a book called Computers as Theater in which she posits that theater is perhaps the most promising foundation for thinking about and designing human-computer experiences; it is a virtual environment that has a well established tradition of using metaphor for design problem solving. Thus, it is perhaps Gropius's vision of a "great light-and-space keyboard" which served as inspiration for the development of various digital user-interfaces for the production of multimedia. Further, Moholy-Nagy's idea that a predesigned picture can be translated into an intermediary language of numbers for the creation of an exact reproduction, may have anticipated the elaboration of digital image-processing tools. Finally, the Bauhaus perspective is at the root of contemporary design which is an integral part of the aesthetic of multimedia. Though the art world has continued to be transformed by further movements and tendencies over the twentieth century, I consider the Bauhaus to be the final important pre-digital artistic antecedent for the development of digital multimedia, along with the undeniable influence of American experimental composer John Cage.

John Cage

Cage, inspired by Eastern aesthetics as well as Surrealism, Duchamp's work and Abstract Expressionism, developed, over the forties and fifties, the idea (derived from the work of French composer Edgar Varèse) of treating all forms of noise as sound to be used by the composer, not as sound effects, but as musical instruments "together with the corollary that silence is as

important". In 1942, he taught music at the Chicago Bauhaus which Moholy-Nagy organized upon his immigration to the United States. Later he gained a reverence for non-intention from Zen philosophy, and elaborated a method of composition based on chance operations and indeterminacy, thereby eliminating creative choice. He combined these ideas with aspects of painting and sculpture in stage performances. Influenced by Artaud's The Theater and Its Double, Cage came to think of theater as a territory of time and space inhabited by unrelated but coexisting events beyond narrative. In 1952, at Black Mountain College, he performed his Theater Piece #1, which blurred the distinctions between music, dance, literature, art and everyday life.

Margot Lovejoy describes this:

Providing context for the performance, Rauschenberg's White Paintings were hung overhead. Merce Cunningham danced throughout the audience and the performance space followed by a barking dog. Coffee was served by four boys in white. David Tudor performed on the piano in competition with Edith Piaf recordings played on an old phonograph by Rauschenberg. Cage sat for two hours on a step ladder sometimes reading a lecture on the relationship of music to Zen and sometimes simply silent, listening. Cage created, and organized the event around chance operations where everyone did whatever they chose to during certain assigned intervals or blocs of time. The experience was a near sensory overload. Each observer's experience of the event was completely different, an aspect central to Cage's performance goals. "The event", as it came to be known, established Cage's unmistakable imprimatur of a kind of intertextuality which we can say were the precursors of a nonlinear, inclusive postmodern aesthetic. (1997, p. 55)

This now legendary work is considered to be the first "happening" and first experiment in chance operations in music and dance.

Cage also ran a class in "Experimental Composition" at the New School for Social Research, in New York in 1958. This was attended by, and served as a revelation for, a wide range of artists from diverse disciplines, including Allan Kaprow, Yvonne Rainer, George Segal, Dick Higgins and George Brecht. Cage's classes suggested that art need not be created from art materials, and advocated "trying anything", which led to the intense experimentation in the art of the 1960s and 1970s and to the evolution of new forms such as Happenings, Performance Art, Assemblage and Environments. Richard Kostelanetz notes:

Partly because of Cage's immense influence, there now exist in each of the nonliterary arts in America two avant-garde tendencies, both of which are clearly distant from nineteenth-century conventions and discernibly different from pre-1945 practice. One would isolate the intrinsic qualities of the art - serial music, minimal and optical painting, early Merce Cunningham; the second would, like Cage, miscegenate - mix in enough materials, aesthetic preoccupations and structural standards from the other arts to insure that something between or inter-media is created. (1991, p. 204)

Thus, though it is considered by many that a definitive transition towards postmodernism took place during the early 1960s, beyond Cage subsequent artistic tendencies can be regarded as variations expanding on his ideas of chance and nonlinearity, and on the devices and techniques developed by the Futurists, Cubists, Dadaists, Surrealists and the Bauhaus. Thus, for example, the Pop movement elaborated on Duchamp's theories, while the trend to use photography for art-making can be traced back to Moholy-Nagy's

teachings. In the same way, the multi-sensory experiments of the electronic era, with television, video, lasers, stroboscopes, etc., and of the present digital age, can be seen as a continuation of the Bauhaus ideal of art/technology fusion for the stage, as well as a technological transposition of collage, montage and photomontage concepts.

The blurring of distinctions between music, dance, literature, art and everyday life advocated by Cage has inspired, in a much more direct way than Artaud's work, an idea of intertextuality which has led to an aesthetic of nonlinearity, or non-sequentiality, that is not only at the root of postmodern thought but also of the research and development of current computer hardware and software. "The genuine ghost in this machine is the spirit not of Alan Turing but of John Cage" proposes Richard A. Lanham in The Electronic Word (1993, p. 46). The "random access" philosophy of current multimedia and hypermedia works which have no physical beginning, middle or end, seems to stem directly from Cage's ideas about accident and chance, ideas which "require the artist to avoid rational creation of hierarchies, and points of climax, in favor of repetition and a kind of all-relatedness" (Lovejoy, 1997, p. 56.). In addition, Cage's emphasis on chance has suggested a spirit of game or play which has become an integral part of recent art experiments as well as multimedia productions in general.

In this first part of my analysis I have attempted to show how many pioneering ideas of the avant-garde artists of the Machine Age have laid the ground for key concepts and aesthetics of what is understood as multimedia

today. The various experiments in synergy between different art disciplines of the European movements of the end of the Enlightenment and the beginning of Modernism, as well as John Cage's teachings, have left us with devices and techniques which I consider to be at the origin of the "revolutionary" principles of new digital forms, multimedia in particular. Thus, Wagner's *Gesamtkunstwerk* can serve as a starting point for a vision of synthesis of various art forms upon which other views of Total Theater and Total Art were subsequently built.

The Symbolist notion of *synaesthesia* remains to this day an important metaphor for the development of technological synergetic configurations. Starting from the Futurists, the interaction of artistic practice with the technological changes of the Industrial Revolution gave rise to new perspectives and innovations. Thus, the Futurist enthusiasm for the Machine Era led to the incorporation of *industrial technologies* into the art-making process. Their proclamation of the primacy of vision over print, and their provocative prediction of the eventual death of the book in the face of the polyexpressive possibilities of new media, seem to have anticipated the impassioned discourse on today's multimedia.

Though stemming from a negative reaction to the changes of the new age, the Cubist idea of *collage* has fostered an aesthetic of mixing forms, materials and techniques prevalent throughout present digital forms, an aesthetic which the Constructivists, and later Dada, expanded in *photomontage* by promoting the use of technological resources as stylistic elements. Through their intense ideological exploration of a fusion of the arts, the Constructivists also arrived at a form of propaganda consisting of layers of different media. This principle of layering, as well as their *montage* film theory, which enabled the amalgamation of illusion with reality, have

been paramount for the further evolution of the idea of synthesis. In spite of their antiart stance, the Dadaists and Surrealists, for their part, as well as Duchamp, introduced through their own version of *photomontage* and their *ready mades*, the idea of appropriation of mass media or mass-manufactured found material. In addition to being a dominant theme in postmodern art, this device of visual quotation, of infinite copy and manipulation, can be seen as forming the basis of the methodology of the production tools for digital multimedia and hypermedia. The Surrealist investigation of the subconscious, and of the different levels of meaning, led to their experimentation in the simultaneous combination and inter-relation of different literary and visual texts, experimentation which has surely served as inspiration for the idea of *intertextuality* that has become central to hypermedia and hypertext.

Through their celebration of progress, the Bauhaus proposed a fresh direction of *Art/Technology fusion*, advocating the investigation of new technological means as creative media as well as collaboration between artists, engineers and technicians. Their ideal has served as a research and development model for numerous projects and experiments in contemporary art, science and engineering synthesis.

Finally, with his ideas on *chance operations* in music and performance, American composer John Cage has inspired a shift toward *nonlinearity* in postmodern thought. This notion of nonlinearity is strikingly similar to the random access philosophy of present multimedia works which have no physical beginning, middle or end, leaving order to the inspiration of the user.

My purpose in this first part of my study has been to suggest merely some of the possible antecedents from the realm of the arts for the digital

form and understanding of multimedia as we know it today. Many more connections still deserve to be made. In addition, while my attention has predominantly been focused on the fields of visual art and theater, I believe that numerous supplementary dimensions from the other arts or the humanities, as for example philosophy or literary theory, are equally worthy of exploration. Most importantly, I have tried to point towards a different direction for the study of new digital forms, in the face of the prevailing technological determinist perspective of our time. Indeed, while I have no doubt that the New Media are dramatically altering the way we create, learn and interact with the world, and that they are opening a wide range of unprecedented possibilities for every aspect of human life, I find it important to not only think about where they are going, but also where they come from. Thus, I would tend to agree with Richard A. Lanham's idea that, perhaps:

[t]echnology isn't *leading* us in these new directions. The arts, and the theoretical debate that tags along after them, have done the leading, and digitization has emerged as their condign embodiment. We needn't worry about digital determinism. We must explain, instead, the extraordinary convergence of twentieth-century thinking with the digital means that now give it expression. It is the *computer as fulfillment of social thought* that requires explanation. (1993, p. 51)

Indeed, I consider that to fully exploit the possibilities of the new digital forms, it is essential to understand all their roots, roots which lie as much in art, culture and the humanities, as in science and technology. And it is by revisiting history, various *histories*, that we can begin to comprehend how we can ourselves shape these "revolutionary" tools that often appear to be uncontrollably and irrevocably shaping our lives.

PART TWO

MULTIMEDIA OF THE DIGITAL AGE:

A VIRTUAL SYNTHESIS OF THE OLD AND THE NEW

Having in the first section examined some of the possible origins of multimedia within turn-of-the-century Western Art practices and concepts, I will now turn my attention to its most commonly referred to present incarnation and practices. Today "multimedia" usually implies the realm of the digital. A number of contemporary researchers in the field of New Media do not deny that many of the techniques developed by the Machine Age avant-garde movements are directly integrated into the production tools of present-day digital media. Lev Manovich, for example, notes that:

One general effect of the digital revolution is that avant-grade aesthetic strategies became embedded in the commands and interface metaphors of computer software. In short, the avant-garde became materialized in a computer. (1995b, On-line)

Indeed, many of the characteristics we now take for granted, such as the "cut and paste" options of practically any computer program or the possibility to "import" almost any kind of image or sound file into almost every kind of application, seem to be systematizations of avant-garde concepts of synthesis. However, in spite of such features, current multimedia does not seem to continue the Total Art spirit of the avant-gardes in the same multidimensional perspective. Today's "multimedia" has come to designate

the use of computers to present text, graphics, video, animation, and sound in an integrated way. One could imagine a wide range of expressive possibilities fitting such a definition, and in fact many possibilities are being continuously explored by artists and researchers working with New Media, notably in VR and in various performative or installational interventions -- artists such as Char Davis and David Rokeby of Canada, or Lynn Hershman of the U.S.A., to name but a few. Many of these can be seen as carrying on the quest for totality and synergy of the historical avant-gardes, using the means of the present. Such explorations, however, remain experimental, often one-time trial runs confined to the worlds of art or technological research, and are usually referred to not as multimedia but as either "New Media Art" or as various prototypes.

What is presently called "multimedia", for its part, has become an accepted systematized model combining specific computer hardware and software. Many consider that it is computer technology that has finally provided the means for the synergy between sound, images and text to become "integrated", for elements as diverse as music, graphics and video to be part of the same single centralized "palette" of expressive possibilities. Multimedia is thus more and more gaining the reputation of being a "new" form of expression in its own right, a new medium. It therefore attracts much techno-enthusiastic hype, claiming especially that it opens up a whole new world of unprecedented possibilities.

Because of its reputation as new form or medium and because of the widespread claims to innovation which surround it, it is on this particular currently accepted version of multimedia that I have chosen to focus this part of my investigation. Indeed, while I do not dispute the fact that this recent computer-based variant of multimedia presents a series of most interesting

different expressive possibilities, I have many reservations as to their "unprecedented" character, their "newness". I will thus here attempt to question the claims to current multimedia's revolutionary innovation, by examining both what it seems to borrow from aesthetic techniques and strategies of the past, and what it seems to offer that is different and unprecedented. A most interesting location for such an analysis is within recent art practice(s) using this form; artistic projects often tend to push the limits of tools and media more so than other types of projects.

Though the term digital multimedia is often used to refer to both web-based works and works stored on CD-ROM, I have opted to concentrate exclusively on the latter because the CD's vast storage capabilities seem to enable and yield more elaborate and complex projects. I have settled on five particular CD-ROMs from my personal favorites which, both as an artist and as an academic, I find exceptionally stimulating. These are: Puppet Motel, Ceremony of Innocence, Immemory, Mauve Desert, and Cyberflesh Girlmonster. They had different conditions of production. Immemory, Mauve Desert and Cyberflesh Girlmonster were completely independent one man/woman very modest undertakings, while Puppet Motel and Ceremony of Innocence were made within much bigger and wealthier commercial, albeit alternative, production structures, the first being produced by the Voyager media-publishing company, the second by Peter Gabriel's Real World label. Nevertheless, each was meant specifically as an in-depth exploration of digital multimedia as an emerging expressive form, in comparison with many other endeavors in the field which explicitly simply transpose works from other disciplines onto the digital multimedia platform, such as numerous "making of" CDs of various films or different "virtual galleries" or "virtual museums", for example. Furthermore, my choice was

also motivated by the diversity of the backgrounds of the makers of these five CD-ROMs. Indeed, Puppet Motel was developed by renowned performance-artist and composer Laurie Anderson. Immemory was single-handedly put together by well-known French New Wave filmmaker and author Chris Marker. Mauve Desert was made by Adriene Jenek who, until this piece, had worked for many years in the field of independent video. Ceremony of Innocence, though developed by a large team of people, was supervised by Alex Mayhew trained in the visual and graphic arts. Cyberflesh Girlmonster, for its part, was created by Linda Dement, a media artist working in photography, video and graphics, in addition to digital multimedia. Finally, all of these works have attracted considerably wide critical acclaim, which was a factor that seemed to confirm the validity of my selection.

In my exploration of these five artworks on CD-ROM I will therefore look for traces of recurrence of past aesthetic traditions as well as for innovative features. To do this I will first concentrate on their characteristics relative to established expressive forms and media as well as established representational paradigms in order to evaluate the novelty of their aesthetics. I will then focus on their computer-based organizational and structural features and investigate some of the possibilities these bring forth. I will conclude by examining the physical aspects related to present-day digital multimedia. My goal is not so much to arrive at any categorical conclusions as to the innovation of multimedia, but rather, to propose some different perspectives and viewpoints from which to think about this emerging form, perspectives and viewpoints that establish a dialogue between the old and the new, the past and the present, and that stand in contrast to the prevailing, seemingly automatic, progress-centered hype surrounding every new

technological development and invention that comes up in the New Media universe.

From Books with Bells and Whistles to Digital Theater

One way of evaluating the degree of innovation of today's digital multimedia is to compare multimedia to other existing expressive forms and media. A striking feature of many a current multimedia artwork is an apparent grounding in the logics of established artistic and/or expressive disciplines. As Erkki Huhtamo puts it in a review of the 1995 MILIA, "the Second International Publishing and New Media Market", held in Cannes:

Most products, however "innovative" their realization may be, fit easily within categories that have either been transposed from the already established fields of book publishing or mass media (film, television) or are directly related to already popular interactive genres, such as video-games. This situation is, of course, customary when a new medium is looking for its forms and its place on the market place, but it does not need to be. (1996, On-line)

Indeed, the majority of these works can be qualified as "expanded forms" of one or several established artistic disciplines, in the sense of Gene Youngblood's Expanded Cinema. As Youngblood put it, "[h]igh-level aesthetic constructs from previous media become the primitives of the new medium" (1970). These utilize the aesthetics of a given form and "add-on" supplementary elements made possible by digital multimedia authoring

tools. Thus, among available titles we find expanded books, expanded films and videos, expanded performances, expanded paintings...

Ceremony of Innocence

One of the most popular metaphors for current multimedia projects is the book format. Real World Multimedia's 1997 CD-ROM Ceremony of Innocence is an excellent example of such a book-inspired approach. Based on Canadian writer Nick Bantock's Griffin and Sabine trilogy, a series of greatly successful innovative art-based novels, Ceremony is the tale of the romance between Griffin Moss, an English post-card artist, and Sabine Strohem, a South Seas postage stamp illustrator, one of whom may be a figment of the other's imagination or the other's muse. The mysterious story is told, both in the original novels and in the multimedia adaptation, through their correspondence of personalized illustrated cards and letters (70 in all). While the paper version presented page-mounted envelopes to be opened by the reader-cum-voyeur, the no less visually exquisite CD-ROM work transforms each missive into a miniature interactive audio-visual collage with which the user must engage in order to progress in the story. These post-card-sized collages consist of various combinations of handwritten and typewritten text, drawing, painting, animation, film, video, music and spoken word.

The logic of this multimedia piece is completely sequential. The work is divided into three chapters following the three books of the trilogy: the "Raven", the "Griffon", the "Falcon". For each chapter the post-cards and letters appear one by one on the computer screen, presenting their picture side or envelope. Each is a distinct separate case engaging the "reader" differently, presenting a "riddle" to unravel in order for the images to come to life and for the card to turn over or for the envelope to open and the text to

be revealed. The reader never knows what needs to be done, as there are no pointers or clues - such as the cursor turning into a hand frequently found in multimedia infotainment - to guide him/her. For some cards, certain elements must be manipulated by the cursor, for others certain zones need to be stroked gently or clicked on rapidly, for still others animation sequences must play through completely and the card will turn by itself. As Scott Rosenberg puts it in his Web-hosted review of the work:

"Ceremony" relies on neither the old "Living Books"-style "click on something to see what it does" approach nor the "Myst"/"Seventh Guest" gambit of "solve this fiendish puzzle before you can find out what happens next." Instead, each new card or letter in "Ceremony" engages you in a different way. Sometimes the cursor gets transformed into a moon or is swallowed by a beast or even disappears altogether. Sometimes you sit back and watch a little show; other times you must intervene for the show to proceed. The feeling is less one of problem-solving -- how do I get past this thing? -- than simple goofing around. And the payoff in clever, droll, imaginative visions is clear and immediate. (1998, On-line)

And, in some cases, solving the enigma can take a fair amount of time. Once the card is turned or the envelope opened, the text appears, handwritten or typed, static or animated, and is read out loud by the characters (Sabine played by Isabella Rossellini, Griffin played by Paul McGann) while it is illustrated by images, animations, digital video/film clips. When the letter has been recited completely -- for while the text is in progress it is impossible to do anything else but wait for it to finish -- the next letter, the response, appears on the screen with its own new riddle to be solved.

While this work is absolutely stunning as to the quality of the audio-visual rendition, its logic remains completely book-like: linear and sequential, text illustrated by visuals. Indeed, the reader can only proceed in consecutive order through the story, at least forward. It is possible to access other cards, but only among the ones already previously visited (the application keeps track), by pressing the "m" key on the keyboard. This displays a list of "thumbnails" (small icons) of all cards accessed until that point. The linearity is further reinforced by the fact that the application is programmed in such a way that every animation, film clip, music score, voice over, must play through in its entirety before it is possible to move on. There is no way of interrupting any of these except by quitting the application.

This piece can be described as a cross between a pop-up book and a sophisticated animated slide show in digital form, with audio playing an important role, not only for general atmosphere but also to provide an illusion of tactility. Indeed, the sound illustrates the various necessary mouse operations through a series of sounds, such as rubbing, glass shattering, animal noises, etc., which bring these operations new life and give the reader the impression that s/he is involved in a different activity than simply "clicking".

Immemory

Ceremony of Innocence is a multimedia adaptation of a series of narrative novels. This may make its connection to the linear logic of the book format seem evident. However, the novel, or sequential story format is but one of numerous forms of the book. Indeed, as Emile Poppe puts it:

The defenders of hypertext seem to oppose and contrast the hypertext to the classical linear text (novels or articles) and film as a visual text.

One is apt to forget that the novel or essay with its characteristics of closure is just one kind of text and that there exist many other verbal and non-verbal discourses that have more in common with the electronic hypertext, e.g. daily newspapers, encyclopedias, recipes, how-to books, anthology collections of essays, etc. These other texts suppose an intensive aspect of doing: they are texts with pragmatic characteristics linked to them. They are texts where the act of "reading" is far from linear. (1998, p. 40)

It is in just such spirit that Chris Marker's CD-ROM multimedia work Immemory is also much like an animated book. Here, it is especially the photo album or scrap-book that comes to mind, for Immemory represents, in the maker's own words, "one person's private treasure trove". The autobiographic project is all about memory, he explains:

In our moments of megalomaniacal reverie, we tend to see our memory as a kind of history book: we have won and lost battles, discovered empires and abandoned them. At the very least we are the characters of an epic novel. A more modest and perhaps more fruitful approach might be to consider the fragments of memory in terms of geography.

Around me are hundreds of photographs which for the most part have never been shown. From every corner visited I've brought back postcards, newspaper clippings, catalogues, sometimes posters torn off the walls. My idea was to immerse myself in this maelstrom of images to establish its Geography.

My working hunch was that any memory, once it's fairly long, is more structured than it seems. That after a certain quantity, photos apparently taken by chance, begin to trace an itinerary, to map the

imaginary country that stretches out before us. By going through it systematically I was sure to discover that the apparent disorder of my imagery concealed a chart, as in the tales of pirates. And the object of this disk would be to present the "guided tour of a memory", while at the same time offering the visitor a chance for haphazard navigation. So, welcome to "Memory, Land of Contrasts" - or rather, as I've chosen to call it, IMMEMORY. (Immemory: CD-ROM by Chris Marker, On-line)

Thus, the title, Marker clarifies, is a pun on or contraction between "Im Memoria" and "I am Memory".

The work is simple and sober in form (almost like a "Powerpoint" slide show). It takes the visitor from page to page of fragments of Marker's memory. These are mostly photographs, either taken by the author or from his family photo albums, but also included are some of his drawings and digital collages, scanned reproductions, posters, newspaper articles, old books, as well as some sound bytes and a few archival film clips from the cinema of his childhood and youth. Almost all of these fragments are annotated by Marker's own words and commentaries, ranging from short notes to excerpts of his writings, and by quotes from those dear to him: his favorite poets, writers, filmmakers... Thus, text is a major component in this piece which requires a significant amount of reading.

This impressive volume of material is distributed along eight different topical sections – La Mémoire (Memory), Le Cinéma (Cinema), La Photo (Photography), La Poésie (Poetry), Le Voyage (Travel), Le Musée (The Museum), La Guerre (War) and X-Plugs, a special section dedicated to Marker's digital collages – all accessible from the main screen. Once inside a section, the "visit" can either remain linear (by using forward and backward

arrows), or go off on tangents at certain intersections which lead by thematic association to parts of the other sections. Through such intersections, Marker connects world history with his own, trips with pictures, films with events, people with his memories, words with places. At all times it is possible to go back to the main screen via the top arrow and to the last intersection via the bottom arrow. As well, at certain points, *Guillaume-en-Egypte*, a cartoony orange cat drawn by Marker and serving as his alter-ego, appears and proposes "interludes", which can be the further clarification of a subject, or some other "memory" related but not belonging to the flow of a given path. In such a way, Marker's system of classification for all the data of this multimedia piece functions much like a dynamic anthology of texts and images with its main index of eight thematic divisions and their respective chapters, complete with cross-references and notes creating further links between its various parts.

Mauve Desert

Another work that can be considered to strongly rely on book logic, though not exclusively and in a very different way, is Adriene Jenik's CD-ROM Mauve Desert, a multimedia "translation", as the maker herself puts it, of Nicole Brossard's experimental novel Le Désert Mauve. In its adaptation of the already multi-layered book, this extremely complex piece interconnects the stories of a series of fictive and real women and one man. Mélanie, the main character of Brossard's book, is a rebellious fifteen year-old growing up in the Arizona desert. She is in search of herself. Her mother Kathy owns a road-side motel, the Mauve Motel, and shares her existence with her lover Lorna. Angela Parkins, a nuclear scientist who works on government projects in the region, is a regular client of the motel bar and the object of Mélanie's fantasies. The mysterious Longman is seemingly Angela Parkin's colleague,

or a federal agent, who stays at the nearby Red Arrow Motel and eventually assassinates her at the end. Maude Laures, also a character from Brossard's book, is a middle-aged Montréal academic who stumbles upon Mélanie's life in a second-hand book shop and decides to translate it into French. Nicole Brossard and Adriene Jenik figure as themselves, the author of the book and the maker of the multimedia work. Thus, while Mélanie steals her mother's Meteor every chance she gets to escape on long drives through the desert, during which she thinks out loud, or to the Red Arrow bar, her mother tries to run the motel, to find ways to raise her difficult daughter, and to lead a relationship with Lorna. Angela Parkins comes to the motel bar with her male colleagues once a month to drink whisky. Longman, the villain, plots nuclear explosions and Parkin's elimination in his hotel room. Maude Laures sits in her study, in Montréal, translating and reflecting on the act of translation itself. Nicole Brossard comments on the origins and process of Le Désert Mauve, and Adriene Jenik retraces the development of the CD-ROM project and of her collaboration with the author. All of these separate stories form a web of fragments which piece together not only the complete story narrated by the book, but also the story of its original conception and of its translation to multimedia.

The multimedia piece is first of all articulated by a map of the Arizona desert area where all the action takes place. By clicking on various identified sites or locations of this map, the reader accesses different parts of the stories of the characters of the original book. These can appear in the form of either video, text, still image, animation, or combinations of these. Recurring among these fragments accessible through the map are composite video segments of Mélanie's numerous drives throughout the region, as seen from the back-seat of her car with her eyes staring out at us through the rear-view

mirror. Clicking on this mirror will yield more of Mélanie's thoughts and recent memories, mostly in written form and sometimes as videos. The dashboard of the car, for its part, is another interface for a further level of data. The radio set enables the visitor to select the desired language for Mélanie's reflections – among English, French or Spanish – or to opt for musical accompaniment instead of voice-over. The glove compartment, once opened by a click of the cursor, extends onto a series of completely different worlds, those of Maude Laures, Nicole Brossard and Adriene Jenek, which in turn lead to their sub-stories, again in the form of texts, videos, collages, graphs, voice-overs. From each separate and different segment a link will take you back to the main map interface.

Though this work seems at first to take the viewer completely randomly from fragment to fragment, upon closer examination one becomes aware that its logic is also a strategy owing much to the book format, though not to the narrative book like the novel, but to other forms such as encyclopedias, almanacs, and dictionaries, where the act of reading is discontinuous. Indeed, every interface of the piece (the map, the car, Maude Laures's study, the Maker's Map) is an index of sorts, which the reader becomes acquainted with quickly and through which s/he can scan for a specific kind of desired information. Once this system is grasped, it becomes possible to visit the work systematically, except for the stop-motion animation clips featuring Longman, which can come up unexpectedly at any moment throughout any part of the piece, apparently randomly invading and "infecting" unrelated segments of action like a virus. The varying nature of all the fragments (written text, video, animation, sound, voice, etc.) is also reminiscent of encyclopedic formats where the most diverse material can be found as illustration (graphics, drawings, color plates, tables, etc.). As well,

each of the fragments can only be viewed one at a time, much like pages in a book. Further, throughout the work, various forms of the written word are ever present: from Mélanie's note book of scribbled thoughts in the glove compartment, to Jenik's scanned production diaries, to the books on the desert and on nuclear research in Laures's study and in the library, to the annotated pages of Le Désert Mauve, traversed by the hand of an invisible reader or translator, which constitute the dynamic frames of the videos of Mélanie's drives.

On the other hand, it can be argued that Mauve Desert owes no less to moving-image conventions which drive the work in an important way. Indeed, most of the content is conveyed through the sequential logic of video (or film). Every level of the piece predominantly relies on short video clips lending dramatic life to the fictional components of the project and (corpo)reality to the "documentary" elements. Though for the most part these were not intended to be viewed in any particular order; they were to be randomly accessed through the different chosen itineraries of each particular visitor. An important series of clips, those leading up to Angela Parker's murder, always play in the same succession, like a miniature movie with its dramatic build-up broken up into short episodes. The last scene of this sequence, in which Parker gets shot, marks "the end" of the piece by taking the reader on a concluding short drive with Mélanie and out of the application to the credits. Mauve Desert can thus be seen and analyzed as an annotated deconstructed video as much as an expanded book.

Puppet Motel

Laurie Anderson's Puppet Motel is also a work of blurred boundaries, incorporating video, music, spoken word, animation, still images and text.

The main "area" of this piece presents an animated virtual scenography evoking a futuristic corridor through which one has the impression of advancing. On the wall of this corridor appear projections of various symbols and icons -- a telephone, a clock, an ice skate, a key, a television set -- each of which, if clicked on, will take the visitor to one of thirty-three different spaces of Anderson's imagination. These are the thirty-three rooms of the Puppet Motel, rooms also accessible through the motel's attic, to which some of the rooms eventually lead.

Each space is a different audio-visual universe set to the pace of Anderson's characteristic minimalistic technologically manipulated songs and stories. Here there are no indications as to where to go or what to do. Getting around requires exploration; it requires manipulating the objects and elements that compose the singular spaces, from various furniture pieces to appliances of all sorts, to walls, windows, doors and passages, to musical instruments, Ouija boards, lamps, alarm clocks, Mayan sculptures, books, newspaper pages, dishes, stars and planets, different graphs, puppets and body parts, etc. Some of these need to be clicked on, moved, dragged or stroked. Others need to be played. The latter include the four prepared violins that come to life with a virtual bow, typed into, like the fax machine, adjusted, like the antennas and knobs of a television set that shows different video clips on different channels, etc. The only recurring constant is the symbol of a glowing electrical outlet (that evokes a stylized face reminiscent of a "happyface") which, if clicked on when it appears, will lead you out of a space and back to the main area or the attic. Each room is related to one of the performer's tunes or tales which it illustrates and animates. Anderson herself is present in many of these spaces (in the form of digital video), performing songs, recounting stories, or simply talking about her work, as when she explains

the concept of the scenography of her 1995 Nerve Bible Tour. In a certain sense, Puppet Motel is an Anderson-style audio-visual anthology of her work. In fact, she comments: "The most amazing thing about working on this project is that it's absolutely the way I think. I don't think in terms of narrative or plot. My mind works through association, and that's how "Puppet Motel" works" (quoted by Nelsen-Epstein, 1999, On-line).

From a different perspective, the whole piece is in many ways like one of Anderson's complex stage performances. It combines her music and texts with unusual sets, projections and various objects. However, in Puppet Motel, the stage is the computer, much in the spirit of Brenda Laurel's well stated metaphor from her classical work "Computers as Theater". Each room can be seen as one of the pieces of a pre-recorded performance show. And indeed, most of these pieces function according to purely theatrical stage logic, with their musical and/or dramatic progressions, simulated sets, props and atmospheric lighting. In fact, even the publisher Voyager introduces the work as such on the cover of the CD-ROM's box: "welcome to *Puppet Motel*, an intimate and completely original performance piece on CD-ROM".

Cyberflesh Girlmonster

Reminiscent of forms of performance, among other creative disciplines, an interesting hybrid is Linda Dement's "Cyberflesh Girlmonster". Somewhere between the pictorial, the cinematic, the theatrical and the literary, this macabre work stages a series of "monsters", which the artist calls conglomerate bodies, constructed from scanned body parts. Some 30 women donated these scannings during the Artist's Week of the 1994 Adelaide Festival in Australia. These surrealistic collages have been animated into moving, breathing creatures, which when clicked-on will trigger the

appearance of another monster, a digital video, an animation, a sound, a spoken text or a typed document relating fragments of women's personal testimonies on lust, rape, battery, abuse, friendship, love... While "Cyberflesh" is perhaps less complex than the pieces previously mentioned, particularly in terms of volume of material, it creates a multidisciplinary world with an unpredictable associative logic of its own that constantly seems to shift from the conventions of one expressive form to another, at times evoking a living painting, at others a talking text, at still others a puppet theater of digital creatures or an animated pop-up book. Here the features of different media co-exist and combine, in a surprisingly simple way, to form a singular universe which escapes classification.

The previous detailed examinations of the five selected CD-ROM artworks suggest that, while multimedia appears to foster various models of associations, connections and "cross-breeding" between data of different disciplines, most of the projects in this "new medium" still seem to be indebted to the general aesthetic logic of established artistic and expressive forms, to a greater or lesser degree.

Disciplinary logic aside, however, a series of other aspects are, in my view, no less worthy of consideration for the analysis of multimedia artworks. These are the pictorial codes the works adhere to, the combinatorial logic according to which their material is organized, the openness or limitation as to reception they provide, their participatory potential and strategies, and the physical characteristics of their delivery technology – of the apparatus that bring them to life. The pictorial codes to which an artwork adheres are perhaps its fundamental frame as to representational traditions and artistic heritage.

Representational Paradigms: Figurative Simulation

Among the previous examples of multimedia artworks, and numerous other available and constantly appearing titles, a recurring constant seems to be their inevitable dependence on figurative representation. While this is no surprise for commercial products, which are often aimed at the broadest possible public, given the said unprecedented expressive possibilities of computer technology it is odd that apparently every multimedia artwork should rely on some form of realism. Figurative representation is predominant in multimedia artworks, from the worlds they depict with their simulated textures and lighting, to the characters and objects that populate them, to the collages using an abundance of photographic images, to the animations and video clips, to the clickable "buttons" which are typically rendered in 3D and have the appearance of various knobs from real-life technology, and even all the way to the cursor, which is often transformed into recognizable inanimate objects or animate beings, as is the case in Ceremony of Innocence. It is curious indeed, in an age where nonrepresentational art, ornamental art without figurative representation, art not only of the established Art World but also of other cultures and nations, has become an accepted and respected variation, that projects employing the most "cutting edge" new media continue to resort to the mimetic and storytelling impulses of the classical expressive conventions of Western Art. It almost seems as if multimedia requires a measure of figurative representation to work. It is interesting to speculate as to whether this phenomenon is a result of the inherent possibilities offered by the tools available for multimedia production, or simply a reflection of the aesthetic preoccupations of our times.

The applications at hand for producing multimedia projects are certainly worth examining, for they play an important role in the form and aspect the products they yield take on. Current software packages - from Macromedia Director, the most popular multimedia authoring program, to the Adobe family of Photoshop, Premiere, Illustrator, etc., to the numerous different digital-image-treatment, drawing, 3D, special effects, and editing tools - are each, in essence, a palette of specific possibilities, offering at the same time as their creative potential, numerous limitations. Each proposes menus of particular options and functions for the construction and treatment of images, animations, movies, sounds, and their combination, organization and presentation. While the possibilities seem endless as these software packages get ever more elaborate, offering ever more new options, it becomes more and more difficult for the artist using them, especially if s/he is not a programmer, to develop concepts not foreseen by their ready-made options. Lev Manovich rightly observes that their logic is based on selection more than creation. As he puts it in a text entitled "The Aesthetics of Virtual Worlds":

The process of art making has finally caught up with modern times. It has become synchronized with the rest of modern society where everything is assembled from ready-made parts; from objects to people's identities. The modern subject proceeds through life by selecting from numerous menus and catalogs of items - be it assembling an outfit, decorating the apartment, choosing dishes from a restaurant menu, choosing which interest groups to join. With electronic and digital media, art-making similarly entails choosing from ready-made elements: textures and icons supplied by a paint

program; 3D models which come with a 3D modeling program; melodies and rhythms built into a music program. (1996a, On-line)

And a large part of these ready-made elements are related to classical illusion and simulation techniques, such as chiaroscuro and perspective, techniques developed for the convincing reproduction of objective reality on a two-dimensional surface (which the computer screen incidentally is). As

Manovich further remarks:

Indeed, the Cartesian coordinate system is hardwired into computer graphics software and often into the hardware itself. When a designer launches a modeling program, he is typically presented with an empty space defined by a perspectival grid, the space that will be gradually filled by the objects he will create. If the built-in message of a music synthesizer is a sine wave, the built-in world of computer graphics is an empty Renaissance space, the coordinate system itself. (1996a, On-line)

According to Manovich, entire languages of established art disciplines are becoming the pre-sets of computer technology, as for example the language of cinema:

Element by element, cinema is being poured into a computer: first one-point linear perspective; next the mobile camera and a rectangular window; next cinematography and editing conventions, and, of course, digital personas also based on acting conventions borrowed from cinema, to be followed by make-up, set design, and, of course, the narrative structures themselves. (1997, On-line)

And what happens once particular cultural codes are implemented in low-level software and hardware, he says, is that they are no longer seen as choices but as unquestionable defaults. Such factors surely influence the aesthetic

directions of multimedia artwork, notably in terms of the pre-eminence of figurative representation.

Figuration is perhaps further re-enforced by another non-negligible feature of current digital multimedia software, and imaging packages in general, which is the possibility they offer to "import" (sample) material from other sources for treatment, material such as scanned documents of any nature, video and sound files, textures, etc. Such a function enables compositing, assembling from heterogeneous pre-existing parts or elements, a form of creation based on quotation and/or appropriation, which is increasingly becoming the norm in digital production. It is worth wondering, however, if it does not encourage the systematic adoption of the aesthetics of the imported established forms (the linear perspective of 2D and 3D graphics, the photorealism of photography and film) rather than the development of new aesthetics. In addition, one can wonder if this possibility does not bolster the incorporation of as many media as possible. Indeed, in many a multimedia production one gets the impression that certain elements were integrated, as for example video clips or photographs, just because the option was available. Even with a work as visually coherent and successful as Ceremony of Innocence one can ask if the video component, the most photorealistic constituent of the piece, is not mainly present because of the nature of the authoring software. Further, would the project not have been even more interesting if this component were replaced by some form of computer animation which can more readily convey the imaginary?

Finally, today's software packages are increasingly "user-friendly"; they strive to be as "WYSIWYG" (What You See Is What You Get) as possible. While many a user appreciates this direction of development, it too has consequences for multimedia aesthetics. Artist Paul Brown considers that

these more user-friendly tools are problematic for creativity, for "by adopting metaphors which reflect existing media usage, these interface tools reinforce traditional points-of-view and make it difficult, if not impossible, to investigate and develop a new multimedia context and 'language'" (1997, p. 129). Brown believes that the adoption of existing paradigmatic metaphors is problematic, because "in essence, they tell the user 'there is nothing new to learn; your existing knowledge and skill can be applied to these new systems'" (1997, p. 141). According to Brown, they cauterize creative development and "could possibly delay (and may even prevent)" the evolution of new methodologies and critical dialogues.

Thus, it would seem that not only the current digital multimedia works themselves, but also the hardware and software used for their production, perpetuate long-established representational conventions. From such a perspective no boundaries are being seriously pushed and no revolutionary shifts are taking place, as many claim; rather, long-established traditions continue to be followed. But the defenders of the "new medium" will argue that the area where important changes are occurring is situated in the unprecedented organizational and/or structural possibilities offered by its novel combinatory logic.

Rhizomatic Databases

While the majority of creative forms - literature, film, video, animation, music, etc. - rely on linearity for the delivery of their messages, to many, digital multimedia seems to offer new expressive possibilities, notably

intertextuality, through a new combinatory logic: non-linearity. According to Lev Manovich, these possibilities are fostered by the nature of the computer. He considers that the computer has become what he calls the dominant "cultural interface" of our times, for as it increasingly takes on the role of a universal media machine. We are no longer interfacing to a computer, but to culture encoded in digital form such as texts, photographs, films, music, and virtual environments. Manovich views this cultural interface as based on three historical cultural forms: the printed word and cinema, both privileging narrativity, and the most recent form, the general purpose human-computer interface (HCI) or database logic. Database logic, he proposes, presents its own set of characteristics:

Many new media objects do not tell stories; they don't have a beginning or end; in fact, they don't have any development, thematically, formally or otherwise which would organize their elements into a sequence. Instead, they are collections of individual items, where every item has the same significance as any other. (1998, On-line)

According to many, the "new" hypertext or hypermedia format makes it possible to concatenate these individual items into infinite combinations, producing works that are completely "open", "rhizomatic", "random access". Such assumptions, however, deserve closer examination.

Emile Poppe, for example, criticizes the general trend in New Media analysis to compare hypertext to linear text. He considers that this is to contrast parameters of different orders, and observes that the qualifications ascribed to the hypertext, having no beginning or end, no center or margin, no inside or outside, have more to do with the document than the text. For beginnings, endings, centers, margins, insides and outsides, he notes, are

inherent to all texts which are always closed, be they published as paperbacks, hardcovers, or electronically. It is rather the document which now exists in a new non-physical dimension for the first time. By considering the hypertext as a "document(ation)" instead, he suggests:

[...] one can best explain certain features of the new medium, for example, non-linearity, a lack of starting and stopping, no center or margins. This is again a pragmatic that is not exclusive for the hypertext-document as it resembles so much what the average reader of a daily paper is doing when he or she skips in a non-linear way from page to page, from column to column - what is called scanning - searching his/her way in a jungle of information and listening to the radio or the television in the background. It is what the researcher has always done when he/she works in a library, compares texts, looks things up in dictionaries and encyclopedias, writes down some quotes, or organizes his/her files. The researcher uses the same basic methodology of documentation that the new media make easier. It is a fact that the new media stimulate a certain use of this material, and their influence on this level should not be underestimated. (1998, p. 40)

He believes that the study of hypertexts or hypermedia would improve if we could give an adequate description of their functioning. A useful proposition for such study is Ruggero Eugeni's suggestion to examine the netlike logic architecture of multimedia works. For, Eugeni suggests, unlike film, where the represented diegetic world depends on the pre-established disposition of visual material, in multimedia it depends on the choices the user makes among those offered by the logic architecture, which he calls the *logic space*. This *logic space* corresponds to the hidden script of a work, to the net of links which connects all its various components and rules their accessibility, a

netlike rhizome-like maze (1998, p. 15). Basically this would be what is referred to as "flow chart" in computer industry R & D jargon.

Viewed from the angle of the set-up of the underlying logic architecture, multimedia works appear in a different light. When we analyze works according to their logic architecture they firstly come into view as structured finite collections of various closed data -- as databases. As Lev Manovich remarks:

Some media objects explicitly follow database logic in their structure while others do not; but behind the surface practically all of them are databases. In general, creating a work in new media can be understood as the construction of an interface to a database. In the simplest case, the interface simply provides the access to the underlying database.
(1998,
On-line)

The architecture is then the plan of organization of a multimedia work, the layout of possible arrangements of all of its materials, a set of options articulated through nodes and links. All such architectures are thus, in a certain sense, nothing more than variations of data search and retrieval systems. Some, like Ceremony of Innocence or Immemory are quite straightforward, while others like Mauve Desert or Puppet Motel are infinitely more complex. Huhtamo notes that:

Common metaphors for the "conversation" with a CD-ROM work are "traveling" or "navigating" - implying that the user somehow penetrates into the work, choosing his/her own paths from its "rhizomatic" (Deleuze) structure. The basic architectural "grid" (or "flow chart") underlying most CD-ROM artworks is spatial and conforms to the idea of the hypertext. Within this "architecture" the

user has multiple "degrees of freedom" to move both in space and time, because the structure undermines the necessity of continuous linear progression. (1996, On-line)

No multimedia work, however, offers complete "random access". All, no matter the number of their nodes and links, direct the viewer according to a large or small number of certain pre-determined paths and not others.

Limits of Freedom

When examined from the angle of the choice of specific paths or options they offer, the reputed complete openness and freedom of multimedia works appears as increasingly relative. Ceremony of Innocence, for example, takes the viewer successively from one post-card/letter episode to the next of its story, offering no options for skipping parts of the narrative or going to a later section before having visited all the consecutive episodes preceding it. The only possibility one has is to return to already visited correspondence by pressing the "m" key on the keyboard between two cards and letters, a detail one has to have read about in the accompanying manual or been otherwise informed of. One can thus argue that this work leaves even less freedom to readers than the book it is based on, which can be read in absolutely any desired order, its sequential strategy being more in the spirit of the film which the spectator must sit through from beginning to end. Chris Marker's Immemory, similarly, allows for scarcely more "non-linearity" than an album. In addition to the simple features of going to the next page, to the preceding page, to the beginning of the section and to the main page or

general index (these features being much like the standard characteristics of books with their general index and section indexes), the interface enables the reader to make certain limited connections between sections, connections predetermined by the author, which in a standard written-word publication could have been achieved by a note at the end of a segment inviting the reader to "please see section x". The difference with a book perhaps mainly lies in the fact that the various parts of the work are only a mouse-click away; no time need be taken to look them up physically by flipping through pages.

Other works apparently offer more "freedom". Thus, Mauve Desert allows the visitor to choose his/her own order and level of viewing. However, the system is here, once again, similar to a catalogue or directory. Though the main area is a visual map with "hotspots", it is no less an index of sorts, as is the glove compartment. And though the visitor can jump back and forth from section to section, and area to area, shaping his/her own reading to personal preference, the main narrative story of the piece (Mélanie's) remains linear. Thus, the available links at different points, taking the reader to other dimensions such as Mélanie's thoughts, Brossard's reflections or Jenek's notes, can be seen as the footnotes to the central story.

Cyberflesh Girlmonster offers a different scenario. In this work, the user moves blindly through the piece. Clicking-on or caressing the animated "monsters" with the cursor is unpredictable. Each click triggers one of a series of sounds, spoken or written texts, animations, images, other monsters, with no apparent relational logic. Here the links do not appear to be associated to specific data; rather, they seem to be programmed to randomly call up any one of the stored fragments that make up the work. Thus, certain fragments sometimes come up several times in a row, while others appear rarely over different viewings. While such strategy creates interesting chance

associations, it can also bring frustration, as it makes it impossible for the viewer to deliberately access a specific section s/he is interested in revisiting, and it forces her/him to continue "playing" as long as it takes until the section comes up on its own again. In addition, one gets a sense of the complete database fairly quickly because the quantity of various fragments is limited.

Limited material is definitely not the case of Puppet Motel which, for its part, perhaps achieves a sense of non-linearity most effectively of all. Though it is also set up according to a system of indexes through which its various parts are accessed, because of the sheer volume of material and the incredible quantity of links, it truly gives the impression of randomness. Through closer examination, however, one realizes that in actuality every link is always associated to a specific document. What contributes to the illusion of randomness is the complexity of the retrieval system. Indeed, it seems to change from room to room, from zone to zone, at times being quite evident, at others presenting a complex puzzle to solve. In most cases, in this work, the links are both concealed and numerous. Thus, in certain spaces, finding a link can take a fair amount of exploration, so much so that when one returns to this space at a later time chances are that s/he will have forgotten where to look, and will stumble upon a different hidden link leading to some other section of the work and giving the impression that the link system has changed. In this way the visitor can spend hours navigating this vast work and always discover new areas, new material, new puzzles, etc.

Both Cyberflesh Girlmonster and especially Puppet Motel, as does to a certain extent Ceremony of Innocence, use an approach to data retrieval characteristic of many multimedia products in general, an approach which

detracts the visitor's attention from their retrieval function by involving him/her in an apparently different activity: playful interactivity.

Interactivity: The Rules of the Game

For many it is the interactivity of current multimedia works, made possible by computer technology, which is their most innovative feature. This feature is said to engage the public in a much more direct way than the "passive" forms which we are used to thinking of as art. Others, like Lev Manovich, argue that "interactivity" is no new characteristic for art; rather, computer technology simply makes possible a different form of interactivity:

All classical and (even more so) modern art was already "interactive", requiring a viewer to fill in missing information (for instance, ellipses in literary narration; "missing" parts of objects in modernist painting) as well as to move his/her eyes (composition in painting and cinema) or the whole body (in experiencing sculpture and architecture).

Computer interactive art takes "interaction" literally, equating it with strictly physical interaction between a user and an artwork (pressing a button), at the sake of psychological interaction. The psychological processes of filling-in, hypothesis forming, recall and identification -- which are required for us to comprehend any text or image at all -- are mistakenly identified strictly with an objectively existing structure of interactive links. (1996b, On-line)

But it is this structure of interactive links which is reputed to provide the user with the possibility of actively creating her/his own experience, rather

than passively accepting a pre-determined singular experience dictated by the work, as in traditional art forms. This different form of interactivity relies on a different type of participation on the part of the viewer, a participation more akin to the involvement required by games. In fact, Margot Lovejoy situates the origins of current multimedia artworks in artist's experimentations with the emerging video-game phenomenon of the eighties (1997).

To some, such game-style involvement is but a subterfuge. Chris Carlsson, for example, considers that:

Any interactive program or game today is a closed loop in which all the possibilities have been thought of and planned for; your "job" is to try to gain access to them. With a "friendly" interface, your work seems like play, and the time spent computing seems really fun and just a big game after all. (1995, p. 242)

Carlsson sees interaction and its playful character as merely the means to personalize and enhance the user's participation in "prefabricated image consumption".

As for games themselves, they generally always imply rules, rules according to which the participant must accept to play in order to partake in the experience; and the interactivity found in digital multimedia is often just such a set of pre-determined rules requiring compliance, rules that condition and shape the participation of the user, imposing certain behaviors and not others. As Huhtamo observes:

[...] the game-playing experience is irrevocably linked to an "apparatus", a pre-fabricated system regulating the relationship(s) between the player(s) and the system (including both the game software and the hardware) and, above all, defining the limits of the interaction. The game playing experience may allow for considerable liberties to

explore virtual worlds, adopt different personalities, make decisions and discover secrets, but in the end these are just carefully tested and calculated parameters [...]. (1999, On-line)

Further, with such a system, as game theorist Brandom Rickman comments, it is very rare that one user experience is not almost completely identical to every other user experience. While the artist of the work may strive to create a structure for experience, s/he usually ends up with a very specific and highly defined experience (Re:Play Online Forum, On-line). As interactive artist David Rokeby remarks:

It is a mistake to conclude that by presenting a variety of perspectives, the artist is being objective and disinterested. Through selection of the specific points of views offered, how they are linked together, and the design of the method of navigation, the artist holds significant expressive power, which is enhanced by this apparent objectivity. This is analogous to the situation encountered in hypertext databases that presume to completely cross-reference the information that they contain. The system of cross-referencing used remains a powerful expression of the ideas of the creator, emphasizing certain kinds of relationships while effectively discouraging others. (1995, p. 140)

Indeed, every work examined in this essay presents a highly defined experience. Each proposes a very specific set of rules the user must accept to follow to participate in the experience. In Ceremony of Innocence and Puppet Motel s/he must find and solve various puzzles, usually with a single outcome, to proceed through the work, in a manner much like a treasure hunt. With Mauve Desert and Cyberflesh Girlmonster, s/he needs to click on certain hotspots to access the works' various dimensions. With Immemory s/he must accept the directions of navigation the work prescribes. And

though some of these works, notably Puppet Motel, offer a tremendous amount of different connections and combinations, they are all in the end pre-determined and only accessible by following the specific rules relative to each piece or each section of a piece. "The fact that the audience is required to engage the art", says game theorist Rickman, "doesn't mean the experience will be any less pre-defined, it only means that the experience won't actually occur if the audience doesn't engage it" (Re:Play Online Forum, On-line). Simon Penny considers that the interactive scenario offers total freedom among a set of fixed opinions, much like the variety of merchandise offered by the supermarket that one *submits* to (1995, p. 56). It then appears that, more so than any greater openness or any personalization of experience, what distinguishes current multimedia's interactivity is its interpolation of the user through playfulness.

Thus, Emile Poppe suggests that a better frame of reference to examine current "new" forms of interactivity is this play aspect, based on game logic, for games ask for a competency unlike the competency involved in reading or viewing. Game-style interactivity is more strongly associated with skills and aspects of competition, he maintains. In games, he says:

[...] the role of imagination or the fictional world is minimal whereas, on the contrary, in all different kinds of fiction the imagination is central. This does not mean that play is absent in fiction. Actually there is a difference of regime: the equilibrium between play and fiction is not the same. The distinction that I am making between two activities when one takes into account the role of imagination is that there is one kind of play where not much imagination is involved (usually called games) and another where imagination is central in a context of play (what we usually call fiction). [...] In addition, the (narrative) games we

find for computers place the subject in the position of a player whereas the (playful) narrations called "fiction" place the subject in the position of the "viewer", "spectator", or "reader". I see no reason to call one superior or more efficient or anything else in comparison to the other. They are different, and although both cohabit the field of amusement and leisure, the involvement of the participant, the player of the play, is not comparable. (1998, p. 42)

From such an angle, however, multimedia works have much in common with other forms of artistic expression based on the participatory game model such as, particularly, certain installations that present specific itineraries that the visitor must follow, or actions s/he must perform in order to experience the work, as well as certain types of performances based on the public's partaking in the action. In digital multimedia, however, the participatory interactive experience is distinctive because of its dependence on the specific characteristics of the technological platform that brings it to life.

The Physical Realities of Digital Synthesis

While digital multimedia artworks (and other multimedia products) can be analyzed according to many a dimension and perspective, an important aspect that seems to be often overlooked is the fact that in the end they are significantly defined and configured by the physical technology through which they are delivered, the black box of the personal computer. In her introduction to a text entitled "The Thin Line: Hypermedia meets Virtual Reality", Carrie Heeter writes:

We are accustomed to naming communication media after the box we have to buy to use them (for example, television or telephone). With computers we stopped buying typewriters or word processors and welcomed a multipurpose machine into our homes or offices. The term "multimedia" began to be used to describe software which required additional purchase of speakers, videodisc players, TV sets, and so on. [...] Hypermedia has always been a function-based name, rather than a box-based name. Proponents of hypermedia find themselves at meetings waving their arms around trying to describe amazing new things that the computer already sitting on the client's desktop could do... When pressed for a definition, I have always said that hypermedia is 'cool things computers can do'" (Heeter, 1993, Online).

And current multimedia is, at least for the moment, inseparable from the characteristics of computer technology. As seen in previous sections, its logic significantly affects multimedia's aesthetic and internal organization aspects. The computer's physical properties, for their part, shape its relationship to its audience in an important way.

Thus, an interesting phenomenon is that in most discussions about recent multimedia works, be these discussions theoretical, artistic or commercial, it usually seems as if the various content elements described float in a boundless infinite virtual space through which the immersed user navigates with the help of a mouse that almost comes across as a prosthesis. The fact that multimedia universes are circumscribed by a terminal consisting of a very physical two-dimensional screen which is part of a very material plastic monitor, surrounded by a no less material standard keyboard, mouse, speakers and often supplementary hardware - in other words a standard PC -

rarely ever comes up. Yet the physical reality of the personal computer determines, perhaps more so than any other factor, the particular relationship digital multimedia entertains with its public.

Indeed, some of the supposedly most unprecedented qualities attributed to the novel relationship between the viewer and the multimedia artwork (in comparison to traditional art forms) are "personal", "intimate", "tactile", "active" as opposed to "passive". Yet, such qualities are in fact, in the first place, characteristic of the general current mass-user/computer relationship, a familiar relationship developed and systematized by the market interests of the computer industry as it has successfully implemented the PC across almost every sector of modern Western society and brought it to most middle-class homes. Thus, "tactile" typically means mouse or keyboard manipulation, while "active" usually refers to a type of interaction standard for practically any current computer interface (consisting in clicking a "button" with the cursor). "Personal" and "intimate", for their part, can be seen as the result of computer marketing's focus on the primacy of the individual, stressing, as Richard Wright puts it, "*individual* rather than *social* access" (1995, p. 87). This last feature of the personal computer has perhaps one of the most important bearings on the difference of current digital multimedia artworks in relation to other art forms as well as to pre-digital concepts of multimedia.

Digital multimedia artworks, like the personal computers on which they come to life, create an individual, one-to-one experience for the user. Such a particularity is unlike that of any other established art form, such as painting, sculpture, dance, theater, cinema, etc., all of which can be experienced collectively in a social context, as were meant to be experienced collectively the avant-garde concepts of synthesis. This particularity is even

different from that of the book form, which, though also designed to be experienced individually, provides the same experience for every separate reader. Multimedia artworks, with their multiple choices and paths, have the potential to produce a different experience for every individual user. While, on the one hand, such potential can be seen as personalization, catering to the specific tastes and needs of every distinct member of the public, it can no less be considered as a model fostering isolation, cutting off the individual user from the collective social dimension of traditional (Western) conceptions of art and culture.

Another feature of the physical configuration of personal computer technology which results in an important demarcation of digital multimedia from its pre-digital incarnations and visions is its concentration on the screen as metaphor for all sensory dimensions, except perhaps for the auditory which is conveyed through speakers: synthesis and the human sensorium are confined to a flat rectangle. In today's multimedia, elements which in other concepts of synthesis stimulated a variety of the spectator's senses and types of perception, such as spatial, tactile or olfactory impressions, are now simulated by representations compatible with the two-dimensional surface of the screen. Such a development basically disconnects the viewer's body from perceptive involvement and replaces it with an almost exclusively visual static experience (based on the intellectual translation of simulative codes) supplemented by rudimentary sound and occasional hand activity with the mouse or keyboard. This takes us back to what Lev Manovich describes as a general tendency of the Western screen-based representational apparatus, a tradition in which, he explains:

the body must be fixed in space if the viewer is to see the image at all.

From Renaissance monocular perspective to modern cinema, from

Kepler's camera obscura to nineteenth century camera lucida, the body had to remain still. (1995a, On-line)

The body needed to remain still in order for the (purely optical) illusion of three-dimensionality, created by two-dimensional surface-based systems of representation, to function. The computer monitor, by the very nature of its flat surface (and the representational systems it uses) perpetuates this tradition.

What's more, according to Manovich, screen-based presentation also induces immobility on the spectator's behalf for psychological reasons:

a screen's frame separates two spaces, the physical and the virtual, which have different scales. Although this condition does not necessarily lead to the immobilization of the spectator, it does discourage any movement on her or his part: Why move when s/he can't enter the represented virtual space anyway? (1995a, On-line)

And indeed this "window into another space" which the computer screen represents encourages the same kind of behavior as the other screens it evokes: those, among others, of cinema and television which we are accustomed to approaching passively. Thus, in a certain sense, the cultural heritage of the physical design of the terminals that deliver digital multimedia to the spectator promotes a familiar passive attitude even if the works themselves aim to stimulate active participation via their, albeit limited, interactivity.

Because of the present characteristics of its physical reality then digital multimedia appears as a far cry from the turn-of-the-century avant-garde multi-sensory concepts of multi-media synthesis which involved the body both physically and socially. Confined to the limits of a specific plastic appliance designed for individual use, today's multimedia can be seen -- as to

the "theater of the senses" visions which inspired it -- as a reduction of the human sensorium, an impoverishment, privileging predominantly the eyes to the detriment of the rest of the viewer's body, even negating the body. Perhaps as computer technology evolves it will, in the near future, break free from its physical boxes, and digital multimedia will then develop into a truly (multi)sensual experience.

In this section I have focused on today's understanding of multimedia. Though a variety of contemporary expressive practices could be considered as the continuation of ideas of synthesis outlined in the first section of this thesis, I have chosen to concentrate on what is currently most often referred to by the term. This recent incarnation differs from the turn-of-the-century avant-garde versions and visions by its entirely digital nature. Also different is the fact that it has already become an accepted systematized model combining specific computer hardware and software, the end project of which can be either web-based or mastered on CD-ROM. This "integrated" model is reputed to be a "new" medium in its own right and is attracting much hype as to its supposedly unprecedented possibilities. In my analysis I have attempted to question these claims to revolutionary innovation through the investigation of recent artworks within the form. Limiting my selection to works stored on CD-ROM, because of this format's vast storage possibilities in relation to the web, which seems to enable more elaborate products, I made my choice among titles intended specifically as art projects, as these tend to be more complex and daring than commercially driven endeavors. Thus, I

consider the five works selected -- Puppet Motel by Laurie Anderson, Mauve Desert by Adriene Jenek, Cyberflesh Girlmonster by Linda Dement, Ceremony of Innocence supervised by Alex Mayhew and Immemory by Chris Marker -- as particularly interesting explorations of the expressive possibilities of digital multimedia. In examining their aesthetic traditions in relation to established expressive disciplines and representational paradigms, and in relation to the possibilities and limitations fostered by their computer-specific organizational and structural features, and in examining the particular artwork-audience relationship resulting from the physical characteristics of the terminals that bring these projects to life, my intention has been to point to novel ways of thinking about the emerging medium that establish a dialogue between the past, the present and the future rather than exclusively centering on progress and innovation.

If examined in relation to existing expressive forms and media, the grounding to a greater or lesser degree of current multimedia works in the aesthetic logic of established artistic disciplines becomes clearly apparent. They then come into view as expansions of these disciplines made possible by the virtue of the medium's integrative possibilities. Thus, Ceremony of Innocence and Immemory can be seen as expanded books, as can Mauve Desert, though the latter can no less be approached from the point of view of the logic of video. Puppet Motel transposes and expands the expressive techniques of stage performance. Cyberflesh Girlmonster, for its part, draws on a combination of theatrical, cinematic, literary and graphic-design devices. Such considerations offer a perspective on today's multimedia such that its new possibilities can be seen as correlating and interacting with "old" forms in a spirit of enriched expressive potential. This perspective proves more

promising than that of prevailing preoccupations with unprecedented novelty.

Another interesting angle to consider in the analyses of digital multimedia works is the derivation of the representational paradigms they adhere to. What then becomes manifest is that these are predominantly based in Renaissance pictorial codes and conventions for the figurative imitation of objective reality on a two-dimensional surface. Indeed, from the worlds they depict with their simulated textures and lighting, to the characters and objects that populate them, to the collages using an abundance of photorealistic images, to the animations and video clips, to the 3D links and hotspots which often have the appearance of various knobs from real-life technology, and even to the cursor which is often transformed into recognizable objects or beings, figurative representation is everywhere in multimedia artworks. This phenomenon is interesting to approach from the point of view of the applications at hand for the production of multimedia projects. Current multimedia software packages deserve attention, for they are the palettes of specific possibilities from which the projects are created, and they can thus have an important bearing on the representational directions of the projects. One of the general trends of these packages is to offer a series of ready-made options to producers, many of which are relative to classical pictorial illusion and simulation techniques, such as chiaroscuro and linear perspective, not to mention the now seemingly obligatory "import" feature that enables the acquisition of visual material from a variety of other sources together with their respective established aesthetic codes. This results in such options being considered as defaults that producers and artists conform to without questioning them, and it discourages alternative representational conceptions. Alternative conceptions and approaches are perhaps also

discouraged by the "user-friendliness" of multimedia software that is based on the digital transposition of familiar creative production metaphors, such as cursors in the shape of brushes for paint programs or virtual keyboards for sound software, which can lead the user to believe that there is nothing new to learn as s/he can simply apply her existing knowledge and techniques. These types of observations suggest that broadening the discussion of digital multimedia works to the contemplation of factors such as the characteristics of the tools for their production can offer an investigation framework that challenges some of its aesthetic aspects that seem to otherwise be taken for granted, and even propose new directions for practical research and development in the area.

Aesthetic aspects aside, another taken for granted dimension of digital multimedia worth re-examining is that of its distinct structural organization principles, its combinatory logic, resulting from computerization which reputedly gives rise to the completely new possibility of non-linearity. These principles, in fact, share the same properties as general computer-information storage systems based on the database; this leads some to refer to them as database logic. Thus, digital multimedia works can be seen as vast databases of diverse media elements which can be concatenated into infinite non-linear combinations via the "new" hypermedia linking format. This format contributes to the reputation that multimedia works have, the reputation of being completely open and random-access. An interesting angle from which to examine this possibility of non-linearity is through the underlying logic architecture of the works. Then multimedia works come into view as structured finite collections of closed data articulated around a set of arrangement options which are basically a search and retrieval interface of sorts. Upon closer examination one realizes that these arrangement options

are always pre-determined and that the supposed freedom offered by multimedia is in actuality illusory. This illusion of complete openness is often achieved through the active involvement of the user by digital multimedia referred to as "interactivity". The interactivity of today's multimedia is different from the psychological or physical interactivity we are accustomed to in other art forms, in that it functions much like games, which demand specific actions on behalf of the player according to specific rules. From such a perspective, the interactive experience of digital multimedia comes across as a very specific and pre-defined experience, which it is more interesting to analyze according to its play aspect, its game logic, which highlights its different engagement of the imagination in relation to other art forms.

Finally, an important aspect of digital multimedia which seems to be often overlooked is the physical reality of the computer technology that displays it. Indeed, the PC with its monitor, keyboard and mouse shapes the relationship that multimedia entertains with its public to a substantial extent. Thus, many of the features ascribed to digital multimedia's novel relationship with its users are in actuality especially characteristic of the nature of the "personal" computer which was designed for the much talked about "intimacy" of the new medium, features such as the "tactility" of the mouse and the "active" interaction with it via clicking. This personal intimacy creates an individual rather than social experience for the user, an experience which can be seen as a form of isolation in relation to traditional collective conceptions of art and culture. Moreover, the centerdness on the screen of PC technology's physical configuration promotes the immobility of the body due to its psychological association with established screen-based art forms designed for passivity. From such a viewpoint, today's multimedia

appears confined by the properties of the box that brings it to life, and appears as a far cry from the multi-dimensional and multi-sensory practices and visions of synthesis of the turn-of-the-century avant-gardes which inspired it.

My purpose with the analysis of this section has thus been to propose alternative frameworks for examining digital multimedia by suggesting often neglected angles and viewpoints that question the prevailing progress- and innovation-centered claims and the assumptions from which they follow. These angles and viewpoints situate digital multimedia within a continuum of concepts, ideas and visions from the middle of the nineteenth century to the present, and they foster a dialogue between the old and the new, the past and the future, rather than a fixation on novelty. Today's multimedia, then, emerges as not only a new medium but also as the transformed continuation of previous aesthetic practices and developments. Such contextualization within the fabric of former traditions of different fields, within various "histories", can, in my view, better reveal not only the qualities but also the shortcomings of New Media phenomena in general, and digital multimedia in particular, and help us see the relevance of certain past experiences for forthcoming research and development in the area. Further, I consider such broadened insight as crucial to shaping the future evolution of all the digital implements of our ever more computerized universe pertinently and wisely.

This study has attempted to challenge a currently widely popular techno-centric and progress-oriented view of the "New Media", concentrated on unprecedented innovation attributed to scientific and engineering technological advances, by arguing that the present digital developments are no less the continuity of a convergence of ideas evolving in the fine arts and humanities of the Western world, since the end of the Enlightenment, as in the sciences. My purpose has been to show how the New Media can be rethought by examining them through their interdependence with other fields of academic, scientific and artistic inquiry. To do this, I have focused on today's digital understanding of multimedia, reputed to be an unprecedented "new form" of creative expression, and its intersection with the field of Fine Arts as defined by the Western tradition. I consider that numerous concepts and practices of synthesis since the Industrial Revolution can be regarded as precursors of multimedia's "ground-breaking" possibilities.

Digital multimedia has been understood, not as a media form, digital tool or technological artifact, but rather as a "constructed complex of beliefs, and procedures embedded in elaborate cultural codes of communication" (Marvin, 1988, p.8). Marvin's definition figures within a theoretical perspective in communication and media studies positing that media and technologies are neither neutral nor fixed objects, but identities articulated in interconnection, interconnections such that context is also constitutive. Working from this understanding, I have concentrated on multimedia's essence of idea of synergy, synthesis or fusion of the arts. I have made use of an "excavation" approach inspired by Finnish independent media scholar Erkki Huhtamo, which he calls "media archeology", an approach that emphasizes cyclical recurrence rather than unique innovation without negating the reality of change for the study of the evolution of media culture

which places it within a much wider frame of reference. My intention has been to evaluate the novelty of today's Digital Age understanding of multimedia by creating a dynamic dialogue between past and present that connects aesthetic visions and developments with technological innovations, resources and realities.

My investigation has followed two directions: on the one hand, the excavation of possible antecedents for the idea of multimedia through a media archeological re-visitation of turn-of-the-century Western Art History, and on the other hand, an exploration as to recurrence and innovation in the aesthetic characteristics of recent, digital, artworks belonging to the current understanding of multimedia. These two directions have formed the two parts of this study.

In the first part, entitled "Multimedia of the Machine Age: an Archaeological Survey of Multimedia Through Avant Garde Movements in Western Art", I have shown the parallelism of many of the pioneering concepts of the avant-garde artists and movements, from the end of the Enlightenment to John Cage, with the reputedly unprecedented features of today's digital multimedia. Thus, from Wagner's *Gesamtkunstwerk*, to the Symbolist notion of synaesthesia, to the Futurist explorations of the polyexpressivity of the Industrial Revolution's new media, to the Constructivist principle of multidisciplinary layering and *montage* film theory, to the different forms of appropriation from Cubist *collage* to Dada *photomontage* and *ready-mades*, to Surrealist investigations of different levels of meaning and consciousness, to Kandinski's *Monumental Art* and the Bauhaus's *Total Art*, to Cage's chance operations and playfulness, many connections can be drawn to the "novel" possibilities of current multimedia. Integration, synergy, non-linearity, intertextuality, sampling, random access,

interactivity and game spirit have their precedents. The aim of this panoramic survey has thus been primarily to propose that various visions and practices of synthesis and fusion of the arts deserve no less attention than technological development for an understanding of the origins of new digital forms, especially of digital multimedia. My intent was to further suggest that countless strategies and inventions from the other fine and liberal arts, as for example philosophy or literary theory, are equally worthy of consideration.

I have limited my excavation in this section to pre-digital examples of visions and practices of synthesis. It seemed especially important to bring these to the forefront as they are seldom ever addressed in the techno-centric histories of New Media in vogue at the moment. The subsequent period, for its part, from John Cage to the present -- spanning happenings of all sorts, the birth of video art, various forms of installation, experiments with early computers, etc. -- is also extremely fertile as to inspiration and derivation of new digital forms like multimedia, and would be no less interesting to examine, even if much more frequently featured in various New Media and Media Art narratives in hard copy publications of diverse natures and on the World Wide Web. Such a project would, however, take me far beyond the scope and goal of the present study, though I do plan to pursue it separately at a later date.

In the second part, "Multimedia of the Digital Age: a Virtual Synthesis of the Old and the New", I have concentrated specifically on the digital systematized model that is most commonly referred to by the term multimedia today, and on its artistic practices, in a discussion aiming to question the unprecedented innovation with which it is widely associated. Through an analysis of five recent multimedia artworks on CD-ROM that I consider to be particularly interesting explorations of the expressive

possibilities of the emerging digital form, I have juxtaposed the present with the past, contemporary forms, mediums and practices with formerly established ones. I have considered current aesthetic tendencies in relation to traditional artistic disciplines and representational paradigms, and in relation to possibilities and limitations resulting from computer-based combinatory organizational and structural features. Particularities due to the physical characteristics of the terminals which bring current multimedia works to life have also been noted.

Thus, I have shown how today's understanding of multimedia can be seen as an expansion of existing expressive disciplines and as a continuation of representational paradigms based in Renaissance pictorial codes. I have suggested that for a comprehensive analysis of digital multimedia practices the production tools and applications at hand deserve careful attention because they have an important bearing on the shape and direction of current works. I have also proposed different viewpoints for examining certain of the reputedly distinctly new features of current multimedia. For example, if we acknowledge that non-linearity, random access and interactivity are all essentially characteristic of general computer storage and retrieval systems based on the database, we may find that a most interesting angle for the investigation of today's multimedia works is the underlying logic architecture of their functioning. They then appear as vast collections of various media elements held together by particular order structures and sets of rules. As well, the play aspect or game logic of today's multimedia can provide new insight on its particular interactive experience, an experience which differs from that engendered by previous art forms due to its game-like involvement of the imagination. Finally, I have emphasized the importance of the physical reality of the computer technology displaying the multimedia

work (its boxes, screens, keyboards, mice). This physical reality defines a large number of the distinctive characteristics of multimedia works, notably particular artwork-public relationship dimensions such as "intimacy", "tactility", "active" participation and "one-on-one" reception.

With this section my intention was to demonstrate certain alternative viewpoints that recontextualize multimedia in particular, and New Media in general. These have been recontextualized within the perspective of a continuum of concepts, ideas and visions from the world of Art. They are thus seen in a manner which contrasts with the prevailing popular point of view of progress and innovation. The acknowledgement of the lessons of past experiences and parallel experiments, here of an aesthetic nature, can serve to expose a whole series of qualities, both positive and negative, which previously remained unnoticed. Such investigation, which can be undertaken in relation to the histories of any number of fields of knowledge, is crucial, in my view, for the research and development of the new digital media, for, as Richard R. Holtzman suggests in his Digital Mantras: The Languages of Abstract and Digital Worlds:

What can be done with traditional means, what can be represented with traditional models, does not necessarily become more interesting because it has been generated using a computer. What is particularly interesting is what was *not* conceivable before computers, expression that takes advantage of the unique new capabilities of computers. (1995, p. 250)

And I consider that one of the better roads to the discovery of what is radically new is an informed understanding of the "old".

In this second section, I have solely focused on the form and practices most commonly understood by the term "multimedia" today. In my opinion,

much overstated hype has surrounded it in recent years. This systematized digital model is by no means the only current artistic multi-media practice using computers. A variety of other approaches within the world of Media Arts, only very briefly mentioned in this study, have been developing over the past two decades, and perhaps even longer, notably in the realm of the much more immersive universe of Virtual Reality. Some of these can be seen as continuing, and even expanding, the multi-sensory avant-garde spirit of synthesis much more so than today's digital multimedia. The correlation of such practices and approaches to the concepts and dreams of the Machine Age visionaries would, in my opinion, constitute another highly stimulating study which I would be most eager to undertake in the near future.

Through this two-fold study questioning the novelty of the current digital form and understanding of multimedia, a study centered on artistic practices and conceptions of Art, my objective has thus been to propose some alternative critical directions for the study of today's New Media. For, while myself a long time New Media enthusiast and user, often among the first to share in the excitement of the latest technological innovations, I find myself more and more concerned by the prevailing Digital and Cyber Hype, by the rhetoric which asks us to believe, as Carolyn Marvin suggests, "that present circumstances differ radically from past ones, partly to deny the continuing influence of the past" (1987, p. 60). According to Marvin:

The rhetoric of the information age lends itself to the conclusion that history does not matter, since all that has gone before means nothing in the wake of the corrective advent of new information machines.
(1987, pp. 60-61)

From this one-sided angle of progress and technological virtue, every New Media is embraced without any reservations and glorified. In response, I feel a

greater and greater need for more skeptical and broad perspectives for counterbalance. In my view, media archeology presents a most interesting approach for such counteraction. Excavation into the past and the re-visiting of history for traces of cyclicity and recurrence offer a standpoint which is informed and more aware as to where New Media come from and where they may be heading. Providing a better grasp of the various forces and agents that have shaped them can help us realize how we might better shape them for the future. Moreover, by allowing the re-visitation and re-construction of history, media archeology suggests the possibility of numerous other "histories" based in diverse disciplines, technologies, cultures, and hence the possibility of actively participating in shaping these "histories", which challenges the concept of History itself.

Through such an approach I was thus able to weave my own history, or perhaps chronology, of today's digital multimedia according to preoccupations central to my art-based interests. A history where the events are aesthetic moments, occurrences and developments; where associations occur on different levels than the prevailing accepted historical facts; where multimedia's present is linked to the past from the point of view of creative inspiration and ideas; a cultural chronology of multimedia rather than a technological or political one, perhaps the embryo of a "history" of artistic multidisciplinary imagination.

In the end, this exercise has provided me with the opportunity to think through, deconstruct and reconstruct the significance and place of not only today's understanding and practices of digital multimedia, but also of my own academic and artistic practices, in relation to the contemporary world of (Western) Art. It will thus then indirectly inform my future artistic work at the same time as the extensive research and theoretical framework developed

for this analysis will serve as an important basis for my prospective academic inquiry into the expression of cultural and ethnic identity through technology in digital Media Art.

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