Digital Currents

Art in the Electronic Age

Margot Lovejoy

Routledge
Taylor & Francis Group
NEW YORK AND LONDON

www.digitalcurrents.com

Digital Currents

Digital Currents: Art in the Electronic Age surveys the major impact of video and digital technologies on visual culture and artistic practice and examines the revolutionary changes taking place in the role of the artist as social communicator. It recounts the involvement of those artists who pioneered early use of electronic mediums in the arts, describing the development of entirely new forms of representation and practice such as those associated with video and digital installations, net art, viewer participation, and virtual, augmented reality.

Digital media have catalyzed new perspectives on art, affecting the way artists see, think, and work and the ways in which their productions are distributed and communicated. Lovejoy discusses key works and the new issues they raise in the context of today's major cultural shifts. This third expanded, updated edition has a new chapter on the Internet and new sections on sound, narrative, and on science, and art, making it an ideal new media and visual culture source book.

Margot Lovejoy, Professor of Visual Arts at the State University of New York at Purchase, has received, amongst many other honors, an Arts International Grant and a Guggenheim Fellowship for her multimedia work. She has exhibited internationally and was recently featured in New York's important Whitney Museum of American Art Biennial and ZKM (Center for Art and Media), Karlsruhe, Germany. She has lectured widely on art and technology issues.

This book has a vital companion website at **www.digitalcurrents.com**

A note about the Digital Currents website

The concept driving the creation of www.digitalcurrents.com is to develop a functioning companion to the book in a form that can be continuously updated in line with the rapid changes going on around us both culturally and technologically. Most of the information content on site cannot be found in the book itself and there are surprises. When clicked on, the many yellow dots in the dynamic overall homepage area will bring up special floating quotes about art and technology. The sites's primary circular modular interface construction allows readers immediate access to artist and media information with online addresses to artists' homepage URLs and significant projects. The Context section of this module provides historical timelines showing relationships between art movements, dates, important technological invention, and world events. The Issues segment raises questions discussed in the book about the relationship between art and technology. The navigation bar located at the bottom of the site contains further information arranged by topics: ABOUT; REVIEWS; RESOURCES; ACCESS&LINKS; GLOSSARY. The Resources, Access and Links areas provide significant information about relevant conferences, centers, magazines. There are articles about on-line library and museum issues and discussion about copyright and the digital frontier and more. . .

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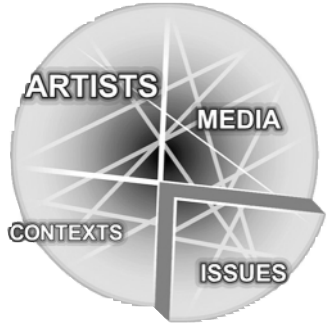

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First published as *Postmodern Currents*: *Art and Artists in the Age of Electronic Media* 1989 by UMI Press
Subsequently re-published 1992 by Prentice Hall (now part of Pearson Education)
Fully revised second edition published 1997 by Prentice Hall
This third expanded edition first published 2004 by Routledge
29 West 35th Street, New York, NY 10001

Simultaneously published in the UK
by Routledge
11 New Fetter Lane, London, EC4P 4EE

Routledge is an imprint of the Taylor & Francis Group

This edition published in the Taylor & Francis e-Library, 2005.

Digital Currents website created by Margot Lovejoy and Jacques Tege through the auspices of Pratt Institute as an independent study under the direction of Miroslaw Rogala, Chair of CGIM/Department of Computer Graphics and Interactive Media, 2003–04

Index compiled by Lisa Kenwright, Indexing Specialists (UK) Ltd

Library of Congress Cataloging in Publication Data
Lovejoy, Margot.
Digital currents: art in the electronic age / Margot Lovejoy.– 3rd ed.
p. cm.
Rev. ed. of: Postmodern currents. 2nd ed. 1997.
1. Postmodernism–United States. 2. Technology and the arts.
3. Computer art–United States. 4. Video art–United States. I. Lovejoy, Margot. Postmodern currents. II. Title.
NX180.M3L68 2004
700′.1′05–dc22 2003025226

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN 0-203-00527-9 Master e-book ISBN

ISBN 0–415–30780–5 (hbk)
ISBN 0–415–30781–3 (pbk)

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Foreword

Because innovation is continuous, it is difficult to establish precise boundaries between historical periods. Which painting or building signals the beginning of the Renaissance? Which work of the imagination or of scientific discovery signals its end? Answers to such questions are bound to seem arbitrary. Surely a historical period is not just the temporal site of certain artifacts and discrete intellectual events. We give names such as "medieval" and "Renaissance" and "modern" to stretches of time that appear to be unified by characteristic beliefs and procedures – or, what is more to the point of Margot Lovejoy's *Digital Currents: Art in the Electronic Age*, periods disrupted by characteristic conflicts.

No society can prevent discord in the relations between individuals and institutions. We know from our own experience and historical memory that those relations have often been difficult, even violent, in modern times. Politics attained modernity in the American and French revolutions. The burst of scientific and technological development in the late eighteenth century is called the Industrial Revolution, a phrase that evokes riot and new poverty, as well as abundant goods and new wealth. Nonetheless, we are sometimes tempted to assume that modern conflict differs from earlier varieties only in degree, not in kind. This assumption leads to the comforting reflection that certain other periods may have been even more violent than ours. Perhaps they were. But the relations between selves and institutions during the past two centuries have inflicted on ordinary life a new kind, not simply a new degree, of harshness.

The modern period began when technological change speeded up to the point where succeeding generations could no longer feel certain that they lived in the same world. As Lovejoy's *Digital Currents: Art in the Electronic Age* documents in vivid detail, modern technology disrupts the history of experience; it changes not only the landscape but the way that landscape is seen. It shapes perception and induces a new kind of uneasiness, the distrust we feel toward tools and convenience that we would be reluctant to do without – devices that have, after all, done much to define what we are. But why should the familiar things of our world – automobiles, television sets, computers – be such frequent targets of

our distrust? Lovejoy suggests an answer in her discussion of artists' access to high-level computer and video technologies.

Access is difficult when innovations sponsored by large corporate and governmental institutions remain under their control, as they so often do. No television network is likely to offer itself as an artist's medium, so video artists must work at a smaller scale. Yet, no matter how intimate and productive one's interaction with technology, there is always the sense that it remains the instrument of institutional authority that by its nature stands in opposition to the self. And the still increasing rate of technological development makes that opposition particularly effective. Often bureaucracies and marketplaces can maintain an ascendancy over individuals (including their own personnel) simply by sustaining change at a destabilizing pace. During the past two centuries, to be a self is to be under relentless pressure to catch up. This pressure has no precedent in earlier times. Individuals were not prepared for it two centuries ago, nor have we adapted to it yet. Artists try to relieve the pressure of change by extricating technology from institutional agendas – that is, some artists engage in that struggle.

Lovejoy draws a distinction between artists who flee technology and those who try to engage it on terms other than the ones dictated by institutional purposes. The contrast is between art as nostalgia for a premodern, premechanical pastoral and art as a means of grappling with a quick-moving present. From this distinction follows another: between the artists who engaged their art with mechanical and photomechanical technology and those who grapple with the electronic technology that has appeared in the last few decades. Among the first group are Marcel Duchamp, the Dadaists and Surrealists, and the Pop artists – most notably Andy Warhol, who, as Lovejoy recalls, went so far in embracing the machine as to wish that he could become one himself. The second group is not so well known. *Digital Currents* is an indispensable guide to an area of culture that is treated as marginal but has already become more central as the electronic media more powerfully define us and our world. Lovejoy singles out for close examination the artists who carry on with the task that has occupied the most courageous sensibilities since the time of the Industrial Revolution: to experiment with advanced technology not for some definable gain but for the sake of making it a more helpful mediator between individuals and institutions. Shaped by aesthetic motives, technology will be better at shaping us.

Carter Ratcliff

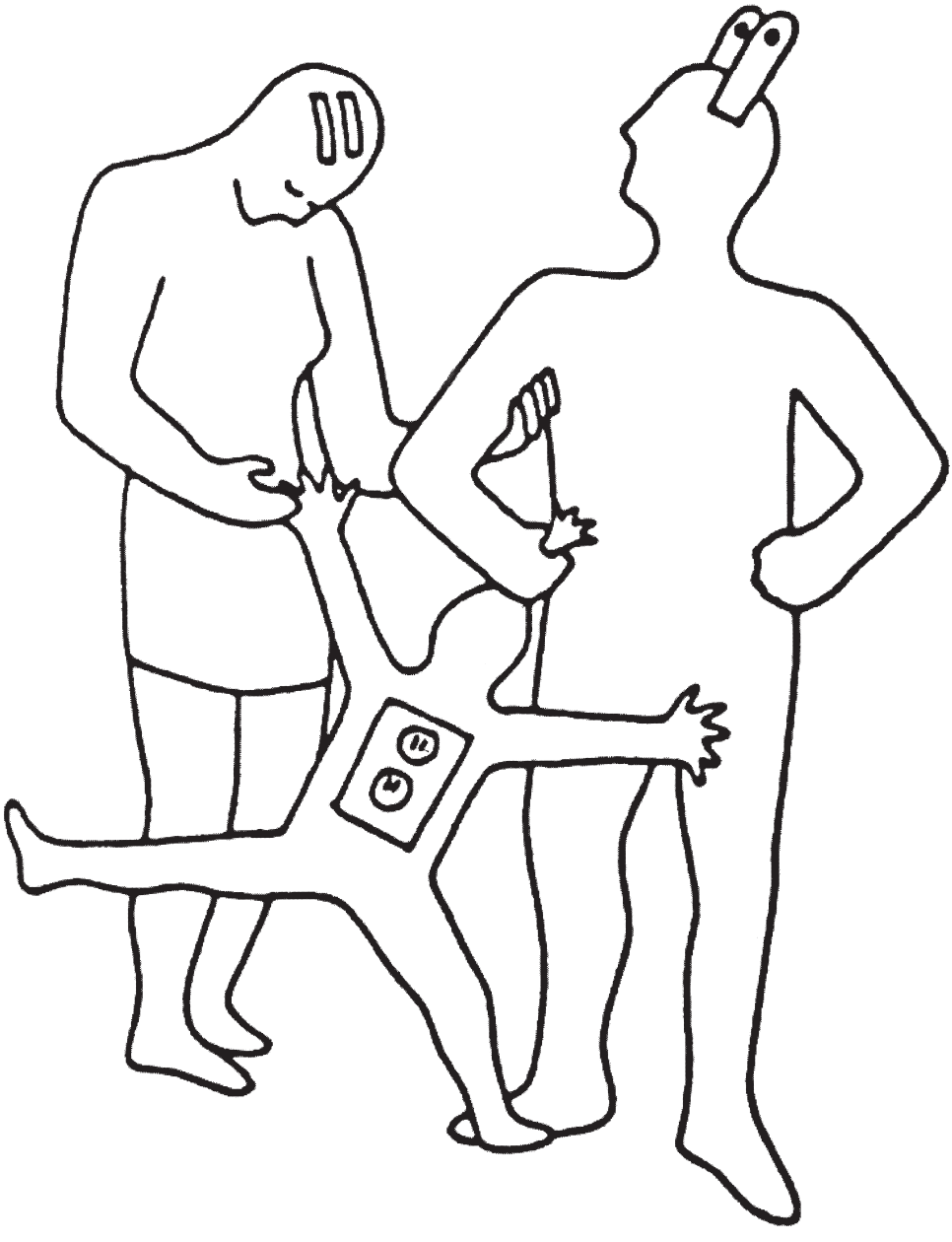
Preface

I have written this book out of a mixture of puzzlement, fascination, curiosity, and, finally, commitment to share what I have learned over the many years it has taken to complete my investigation. It grows out of the concerns artists themselves have about the development of art. Because artists' work is necessarily in the vanguard relative to later interpretation of it by art historians or critics, this book is meant as a frame-of-reference for the future. It is a survey designed to make connections – to penetrate the morass of issues and historical detail, to find pathways which cross over fields to reveal a structure which, like a Mayan monument covered by jungle growth and long hidden by neglect, is suddenly revealed for what it is. The function of this cross-disciplinary book is simply to uncover these connections. In extending Benjamin's theories about how technology changes the way art is produced, disseminated, and valued, and how new art forms grow from new tools for representation and new conditions for communication, I examined the conditions of our postmodern electronic age to find the roots of the present crisis in art.

Because this book is a survey, a major regret on my part is that I cannot include more of the important art works and artists. I've been able only to touch the tip of the proverbial iceberg. Difficult choices had to be made in order to complete my task without too much digression from the points that needed to be covered. Because each area of electronic media is now so large and has so many practitioners, I had to decide whether to present more historical illustrations or more current work. I tended toward the latter. A Glossary of technical terms appears at the end of the book. As in any survey, much of the material has had to be greatly condensed. Although some technological information presented here will inevitably be superseded by new developments even before *Digital Currents* appears in print, I believe reporting on the current status of technology will help to create a flavor for the issues under discussion. Changes are occurring at an ever-increasing tempo. It is my hope that the reader will find this book to be an important signal along the path. A website, digitalcurrents.com, accompanies this text as an ancillary source of information and insight. It contains major resources about media, artists, issues, and contextual information in the form of time lines. Its links to artists' homepages and other important resource materials will be updated on a regular basis.

Acknowledgments

Apart from the many artists, galleries, and colleagues who helped make this book a reality, I owe special thanks for the contributions of Kristin Lovejoy, Ruth Danon, and Andrew Levy, as well as to my husband Derek for his invaluable editorial help and his enduring support. To each, my profound thanks.



Mark Kostabi, *Electric Family*, 1998, ink on paper.

(*Mark Kostabi*)

Introduction

> Our fine arts were developed, their types and uses were established, in times very different from the present, by men whose power of action upon things was insignificant in comparison with ours. But the amazing growth of our techniques, the adaptability and precision they have attained, the ideas and habits they are creating, make it a certainty that profound changes are impending in the ancient craft of the Beautiful. In all the arts there is a physical component which can no longer be considered or treated as it used to be, which cannot remain unaffected by our modern knowledge and power . . . We must expect great innovations to transform the entire technique of the arts, thereby affecting artistic invention itself and perhaps even bringing about an amazing change in our very notion of art.
>
> **Paul Valéry** [1]

Living at the beginning of the twenty-first century in new conditions produced by the electronic era, artists confront a revised cultural and technological context. The purpose of this book is to examine the relationship between technological development and aesthetic change. It views the cultural crisis of the present postindustrial age by seeing it as parallel to the wrenching cultural, aesthetic, and social crisis brought about by the Industrial Revolution.

Fundamental to the understanding of the impact of technological media on society as a whole, as well as on perception and the fine arts, is the work of Walter Benjamin.[2] He brought into a key position in critical discourse awareness of the relationship between art and technology. He argued that widespread integrated changes in technological conditions can affect the collective consciousness and trigger important changes in cultural development. His essay "The Work of Art in the Age of Mechanical Reproduction" (1936) is a significant assessment of the pivotal role played by photographic technologies (first as catalyst, then as instrument for change) in twentieth-century art.

Figure I.1. Georges Méliès,
Le Voyage dans la Lune, 1902, film still.

(Museum of Modern Art/Film Stills Archive, New York)

Benjamin was the first to study mass culture seriously as a focus of philosophic analysis. In "Author as Producer" Benjamin anticipated the crisis of identity, and the loss of moral authority of the author/artist. His interdisciplinary thinking anticipated the interwoven, layered structuring of associations and observations that has come to be understood as the postmodern. It is clear from his writing, particularly "The Arcades Project," that, while Benjamin understood the potentially positive influence of technology on art and on culture, he was also aware of the major losses created by what he called the loss of "aura," that sense of uniqueness and primal consciousness that attaches to a singular work of art and that is lost in reproduction. Whether consciously or subconsciously, the independence and the deep integrity of his thinking led him to move philosophy beyond what Adorno called the "frozen wasteland of abstraction" to a concrete engagement with historical concerns and images.[3] This entailed endless examination of the forces which formulate culture. His work is still alive for us today as a medium for "fertilizing the present."[4]

Benjamin's work has influenced contemporary cultural critics and theorists including Roland Barthes, Jean-François Lyotard, Jean Baudrillard, Michel Foucault, and Jacques Derrida. In addition, aspects of his thought have deeply affected a generation of writers such as John Berger, Raymond Williams, Geoffrey Hartman, Celeste Olalquiaga, and Brian Wallis. His writings are included in important collections of postmodern essays such as *Art After Modernism: Rethinking Representation* (edited by Brian Wallis) and *Video Culture* (edited by John Hanhardt), among many others. Several of his essays serve as benchmarks for today's generation of students of the social sciences and the arts.

Figure I.2. *National Aeronautics and Space Administration (NASA),* Astronaut David Scott Plants American Flag on the Moon, July 26, 1971.

This and the Méliès image reflect powerful changes in our awareness. Méliès's 1902 fantasy film about the moon landing evokes "man on the moon" mythologies – green cheese and all the clichés still embedded in our vocabularies about the moon. The 1971 reality of the moon landing, as seen internationally on living-room television screens, created a major generation gap between adults, who saw it as proof of the impossible come true, and their young children, who saw it as just an everyday event on television. For the children, it was the basis of the expectations of their age. Today's generation witnessed the 1988 scaling of Mount Everest via a miniaturized television camera so small it could be placed in the headgear of one of the climbers.

Cultural studies, which have gone beyond Benjamin to provide the most illuminating commentary on current representation issues vis-à-vis mass media and technological conditions, come from several sources: Baudrillard on simulacra, simulation, and the hyperreal; Barthes and Foucault on intertextuality and interactivity; Derrida and the feminist movement on deconstruction. These theoretical understandings, which further those of Benjamin, are useful tools for probing and exploring art in its relationship to technology. This is so especially now that it can be demonstrated that some of these theoretical concepts closely correspond to the structure and functioning of electronic media tools themselves.

I have written this book out of a need to explore the impact of electronic media on representation and on our culture as a whole, and, in the process, to extend the theories of

Benjamin. Photography and cinematography created what Benjamin called "a shattering of tradition," a crisis in representation without fundamentally shifting the Western paradigm of art. However, digital simulation has finally shattered the paradigm of representation we have been operating under since the Renaissance. We are now, in many ways, living in a new world.

In this book I am using a definition of representation which refers to a system of iconography containing both the perceptual and the aesthetic when related to art and having conventions of both tool and medium inscribed in it. At different moments of history, it changes relative to a paradigm which contains within it the unified framing of agreed-upon assumptions that shape the understanding of what art is in a particular period. Images or objects that artists construct are not just simple responses to individual experience. They are always ordered, coded, and styled according to conventions which develop out of the practice of each medium with its tools and process, whether the medium is a traditional one such as painting, sculpture, printmaking, photography, or an electronic one such as video or computer. Artists' vision and artists' responses to the world are dominated by the conditions and consciousness of a particular period.

The invention of the camera (Chapter 1) changed the nature of representation in drastic ways. Photographic images depend on the variable gaze of the camera eye. Photographs are inseparable from time passing and from the specific placement of visual reality. Cinematography provides the possibility of multiple viewpoints. The camera moves, rises, falls, distances objects, moves in close to them – coordinating all angles of view in a complex juxtaposition of images moving in time. Film (and video) offer a deepening of perception, for they permit analysis of different points of view and they extend comprehension beyond our immediate understanding by revealing entirely new structures of a subject beyond those available to the naked eye alone.

The modern period, most often described as the period between the end of the Enlightenment (corresponding to the end of the eighteenth century) and the middle of the twentieth century, has been described from a variety of positions. In the use Walter Benjamin made of the term, "modernism" referred to a diverse historical period which evolved in the conditions and context of the Machine Age. New forms of representation such as photography and cinematography contributed to a new consciousness and to more modern ways of seeing which reflected the idealism of a faith in progress through technological progress.

Benjamin pointed out, however, that the discovery of photographic technologies from 1850 onward essentially undermined the existing function of art, not only because photography and photomechanical reproduction could provide visual reportage but because it threatened the "aura" and value of the original, the handmade object that relied on the specialized skills of the artist. He understood that once a camera records images or events unique to a particular place and time, a disruption of privacy takes place. Its uniqueness is destroyed. A loss of its original magic, spirit, authenticity or "aura" takes place. John Berger comments that in our present culture the unique is evaluated and defined as an object whose value depends upon its rarity and status as gauged by the price it fetches on the market. But because the value of a work of art is thought to have a value greater than a commercial one, it can be explained only in terms of "holy objects": objects which are first and foremost evidence of their own survival.[5] The past in which they originated is studied in order to validate them. Once the work is seen in many different contexts, e.g., reproduced in different forms such as on a postage stamp or a billboard, its meaning changes. It begins to mean something else and fragments into new sets of fresh associations.

Photography is not simply a visual medium but is also a photomechanical tool, a means of reproducing endless copies from a single original, an aspect that Benjamin acknowledged as the major factor affecting art in its relation to the age of mechanical reproduction. The copying processes of photography undermined the aura of the original and its value in the marketplace. Thus it threatened the existing foundations of the art establishment which were based on the hand skills, implying the genius of the artist. Photographic reproduction and the cinema raised social questions about the artist's role, about the audience for art, about art as communication rather than art as object, and thus brought into focus the social function of art. Because of its threat to the art object and the issues it raised in its association with Machine-Age copying processes, as well as its challenge to established canons and institutions of art, photography's full development as a medium for art and its acceptance as a viable fine art form were suppressed until the beginning of the postmodern period.

Rather than using photography directly as a medium for their work, painters were moved from a preoccupation with forms of illusion and realism toward attitudes which led to abstraction and formalism. Many artists used photography indirectly as a tool of reference or aid in their drawing and painting activities only in the privacy of their studios. However, many were influenced by the aesthetic aspects of the new form of representation. The works of Manet and Degas reflect the influence of photographic imaging in the flatness of the pictorial space and in the unexpected and informal composition associated with photographic instantaneity.

Figure I.3. Fritz Lang, *Metropolis*, 1926, film still.

Lang constructs a terrifying image of a twenty-first-century totalitarian society dominated by technology. Here, he is shown on set shooting a scene from *Metropolis*, his last major silent film, where the mad scientist Rotwang reveals "The False Maria" robot he has created – the personification of technology used for evil persuasive purposes.

(Museum of Modern Art/Film Stills Archive, New York)

A number of avant-garde strains developed in reaction to the Machine Age (see Chapter 2). Two of these movements used photography and technology directly, but they took different routes. On the one hand, the Dadaists and Surrealists developed strategies to use machine parts and photomontage as a means of commenting on the alienating influence of rampant industrialization and the commercialization of mainstream art. On the other hand, the Constructivists and Futurists extolled the aesthetics of photographic reproduction, seeing hope in the Machine Age for a new kind of culture . They used photomechanical technology to extend and distribute their work. Paradoxically, the Cubists, whose painting aesthetic was deeply influenced by the visual experiments of Marey's chronophotography, did not use photography directly. Similarly, although the Bauhaus artists used machines to manufacture their work, they created an aesthetic of pure form.

By the 1930s the term "modernism" came to refer to a special institutionalized movement, an aesthetic understanding of art shaped by the systematic critical writings of Clement Greenberg in essays he published between the 1930s and 1960s. Greenberg argued that art practice conformed to immaculate, linear laws of progression that were verifiable and objective. He favored a reductive understanding of art as pure form, a stance that excluded any literary or theatrical references or descriptions and shut out the real world as subject matter.

Mainstream Abstract Expressionist painting and sculpture were countered by an avant-garde that centered on the ideas of Marcel Duchamp and the Pop movement. While the European avant-garde was more political in its opposition to the status quo and to technological conditions, the American Pop movement was avant-garde in its adoption of industrial technologies for making its work. When Andy Warhol began silk-screening photo images directly onto his canvases, Pop artists began the appropriation of mass culture, photomechanically reproducing images directly into the field of painting. In so doing, they bypassed dealing with the social implications of photography raised by Benjamin. Although many photographers such as Steiglitz and Steichen asserted photography as a fine art medium, it was not until after its reproductive technology was brought directly into the field of painting by Pop artists, more than one hundred years after its invention, that it was accepted into the canon as a fine art medium like any other.

Postmodernism (see Chapter 3) is a shift to an essentially far broader territory in which the suppression of social and cultural influence is no longer possible. The defining moment in the visual arts, when the shift to postmodernism began, was the late 1950s, when architectural forms of representation began to be radically revised away from pure formalist tendencies toward a more "vernacular" style. The aloofness of the steel curtain walls with their purity and rationality seemed at odds with the times. New technological conditions, including electronic communication networks such as television had deeply invaded private space, creating a new kind of cultural infrastructure. Postindustrial capitalism based on electronic technologies under development from the 1950s and 1960s ushered in a new kind of "information society," a "society of the spectacle."

Avant-garde movements in the 1960s and 1970s moved, in opposition to the still-dominant modernist aesthetic, toward an expanded dematerialized view of art – for example, Earth art; Fluxus; Performance; Conceptual art – and work that incorporated the new electronic media tools, especially video and the computer. The incorporation of mass culture and photography into the fine arts by the Pop movement, in tandem with the use in the arts of new forms of electronic representation, marks the moment of a major crisis for representation.

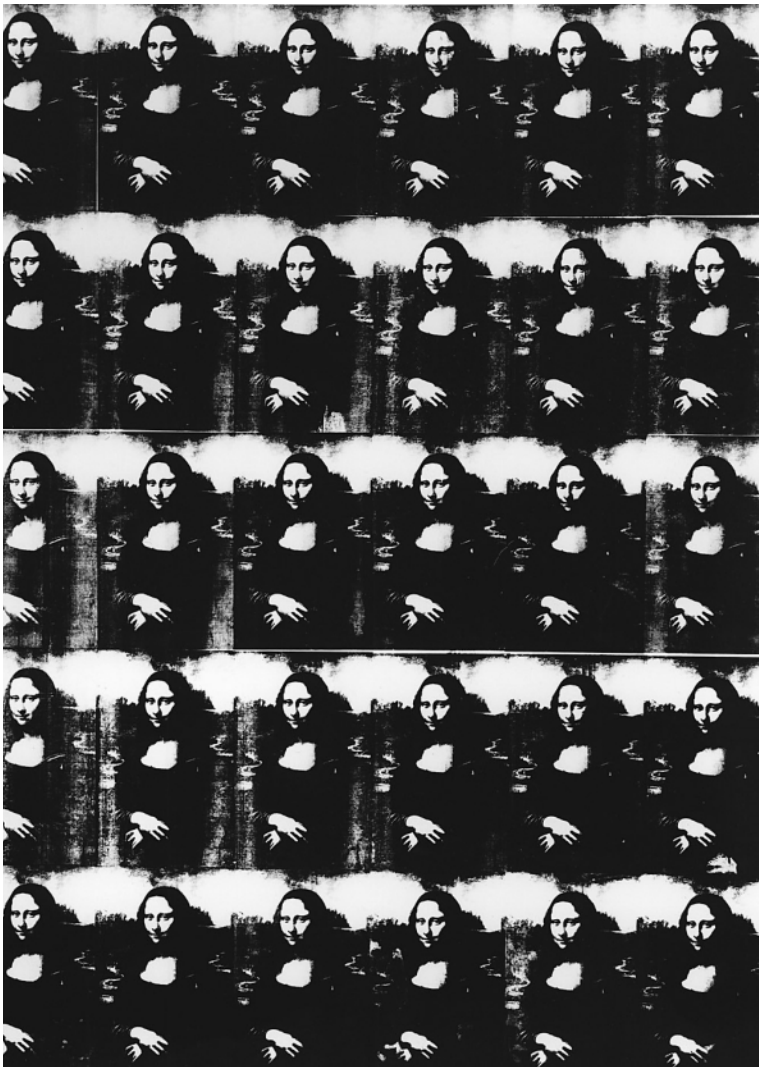


Figure I.4. Andy Warhol, *Thirty Are Better than One*, 1963, silkscreen on canvas, 110¼in. × 82¼in.

Warhol creates an "original" constructed of thirty copies of the original. His appropriation of the most famous cultural icon of all time is a comment on the power of reproductive media to promote celebrity.

(Photo: Nathan Rabin)

Ironically, once photography was accepted into the fine arts canon, all the issues denied for so long under the rubric of modernism became the very focus, the very means of deconstructing modernism. The deconstruction of the fine arts canon began through widespread use of the tools of critical theory, whose influence emerged in the 1970s. Of particular importance were the issues brought out earlier by Walter Benjamin (about aura, identity, the copy and the original, death of the author, originality and genius); along with poststructuralism, psychoanalysis, and feminist theory. This process of deconstruction, particularly by feminists, raised consciousness regarding the marginalization of certain artists not only because of

gender but because of race or class. Artists began to use theoretical issues themselves as the very subject matter of their work.

In the arts, electronic media such as video and the computer challenge older modes of representation. New media have created postmodern conditions and have changed the way art itself is viewed. Culturally, it is characterized by major change: From the concept of a single Eurocentric cultural stream dominated by white male privilege to one which recognizes diverse identities and voices interacting in a complex web of ideological and behaviorist associations. It is further characterized by the impact of mediated images on perception; by deconstruction of the major canons and narratives that have up to now formed Western thought; and by the development of a visual culture, transmitted by electronic technologies which have consciousness-transforming capacity, superseding one that relied mainly on the word.

Video was welcomed as a powerful new form of representation – a time/space medium capable of broadcast and transmission of images and sound over long distances. It was welcomed by a diverse range of artists from many fields (see Chapter 4). At first, it was rooted in formal modernist concerns. As its technology evolved, it began to converge with television and film. Although different from them, it also became a consciousness-transforming form of representation. It has now become part of an expanded multimedia territory where it is combined with the interactive capabilities of the computer, as in CD and DVD production, and in virtual reality and interactive installation works. It is also used as a means for capturing moving images to connect to the Internet.

The digital simulation capabilities of the computer create a break with the paradigm of representation we have followed since the Renaissance. The computer has the capability of combining sound, text, and image within a single database. Images no longer reside in the visual field but in the database of the computer (see Chapter 5). To see an image, information about the image's structure of lights and darks must be called up for display. The image is thus an information structure which has no physical presence in the real world. Not only is it a dematerialized image, but it is also one which can be destabilized and constantly invaded, changed, and manipulated by a viewer interactively through software commands. This possibility for intervention and interaction challenges notions of a discrete work of art, one that is authored by the artist alone. An interactive work is one which uses branching systems and networks for creating connective links and nodes. The artist who decides to work with technology now assumes a different role in relationship to creating work, one similar to a systems designer, and the work takes on a different route in relationship to the viewer who participates in the work's ultimate unfolding and meaning.

George Landow, in his *Hypertext: The Convergence of Contemporary Critical Theory and Technology*,[6] demonstrates that, in the computer, we have an actual, functional convergence of technology with critical theory. The computer's very technological structure illustrates the theories of Benjamin, Foucault, and Barthes, all of whom pointed to what Barthes would name "the death of the author." This happens immaterially and interactively, via the computer's operating system.

By the 1980s, the growing crisis in representation brought about deep changes in both theory and practice. The pervasiveness of media technologies in modern society creates a new set of questions which call for new theories of the relation between language, behavior, and belief, and between material reality and its cultural representation. Baudrillard speaks about the veritable bombardment of images and signs as causing an inward collapse of meaning where "reality is entirely constructed through forms of mass-media feedback where

Figure I.5. Paul Hosefros, *Gauguin and His Flatterers*, June 25, 1988, photograph, *The New York Times*.

This Gauguin painting destined for sale to the public has its value increased by being shown on the front page of *The New York Times*. Copies of the original newspaper (sold for a few cents) show how copies of the original painting (sold for a few dollars) are here being compared to the original (sold for a few million). The right to reproduce this photographic copy (of the copies and the original) was purchased by the author of this book, for $100, to reproduce an agreed-upon number of copies of the original.

values are determined by consumer demand." Is there any absolute knowledge when there is no longer an authentic message; when there is only the absolute dominion of information as digitized memory storage banks? The constant melting down of forms causes a kind of "hyperreality," a loss of meaning as a result of the neutralization of difference and of opposition, which dissolves all claims to universal truth.

Inasmuch as any survey inevitably suffers from exclusions and from serious compression of the major critical and historical issues, this book is meant to function as a framework for discussion about the relationship between technology, representation, and perceptual and aesthetic change. I have written it out of my concerns as a contemporary artist aware of the gap in understanding in the relationship between art and technology. Since writing the book fifteen years ago, much has become clearer and much has shifted in my perception of technological change due to the rapidity of unfolding developments and their significance for the visual arts, particularly in the area of interactivity, and of virtual reality, and in the field of interactive telecommunications and the World Wide Web. In revising and updating it as a result of these major changes, I am addressing these new areas. Most of all, I wish to deepen the debate. Like many artists, I was excited by the promise of the new media. I still engage with them, but I cannot say that I do so without a great awareness of their dangerous social and cultural implications. I am also aware that the book is dealing with current issues and with technologies which rapidly become obsolete. My concern in writing it is to create the ground for future discussion about the relationship between art and technology.

Notes

1 Paul Valéry (1871–1945) is regarded as one of the greatest poets of the twentieth century.
2 Walter Benjamin (1896–1940) committed suicide as he was about to be captured by the Nazis at Port Bou in France.
3 Theodor Adorno, Introduction to Benjamin's *Schriften*, p. 7. Quoted in Gary Smith, ed., *Benjamin: Philosophy, Aesthetics, History* (Chicago University Press, 1989).
4 Terry Eagleton, *Walter Benjamin* (London: Verso Books, 1992), p. 179.
5 This discussion of Walter Benjamin's thought owes a debt to John Berger's *Ways of Seeing* (London: BBC and Penguin Books, 1981).
6 George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore and London: Johns Hopkins University Press, 1992).

part one

SOURCES

1

Vision, Representation, and Invention

> The history of every art form shows critical epochs in which a certain art form aspires to effects which could be fully obtained only with a changed technical standard, that is to say, in a new art form.
>
> **Walter Benjamin**

Seeing is changing

The mind of any age is the eye of that age. Consciousness of the way the world is understood changes at different moments in history relative to the available knowledge of that period. A major shift in consciousness can change the premises about how we should seek to understand the world; what is important to look at and how we should represent it. Technological advances inform powerfully our knowledge base and affect all the premises of life, altering the way we see and think. They affect the content, philosophy, and style of art works. Technological development and artistic endeavor have always been closely related in one way or another, whether in a linear sense or a paradoxical one. Invention of technological tools for representation affects the way the world is seen, how events are interpreted, and the way culture is formed.

Today's avalanche of powerful new representational electronic tools has created a dramatic change in the premises for art, calling into question the way we see, the way we acquire knowledge, and the way we understand it. Contemporary artists face a dilemma unimaginable even at the beginning of the twentieth century when photography and cinematography created a crisis in existing traditions of representation. Electronic tools and media have shattered the very paradigm of cognition and representation we have been operating under since the Renaissance.

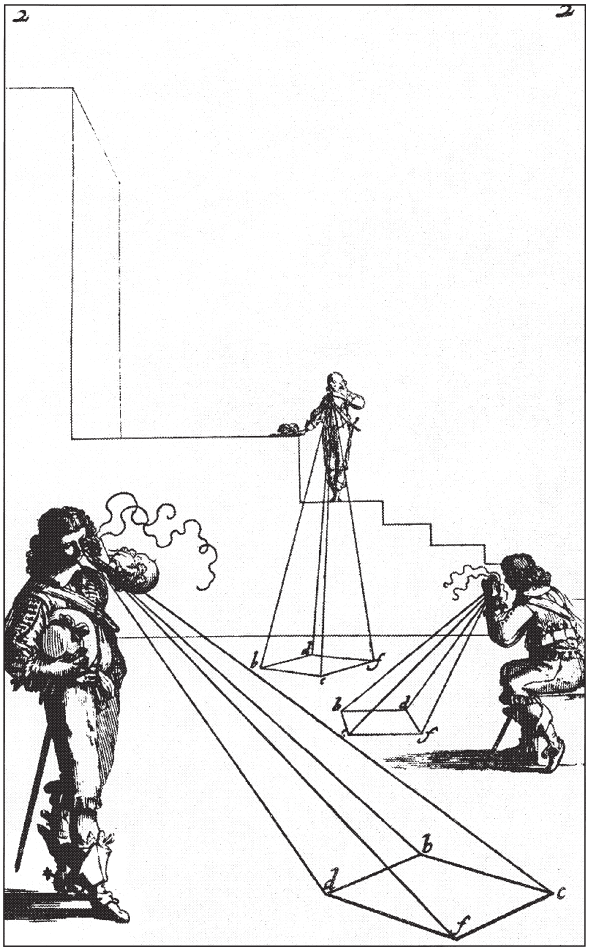


Figure 1.1. Abraham Bosse (1602–76), *Perspective Drawing*.

Sighting 2-D illusion in 3-D space using the mathematical structure of perspective.

Dick Higgins, poet, composer, publisher, and performance artist, sums up the current paradigm shift by formulating a myth as illustration and by raising questions.

> Long ago, back when the world was young – that is, sometime around the year 1958 – a lot of artists and composers and other people who wanted to do beautiful things began to look at the world around them in a new way (for them).
>
> *The Cognitive Questions* (asked by most artists of the twentieth century, Platonic or Aristotelian till around 1958): "How can I interpret this world of which I am a part? And what am I in it?"
>
> *The Post-cognitive Questions* (asked by most artists since then): "Which world is this? What is to be done in it? Which of my selves is to do it?"[1]

What does it mean when the image is no longer located in the visual field but is located only as information in a database? What is the role of the artist in an interactive art work in which the public becomes an active participant? Can art go beyond objecthood to be an

immaterial form of communication located on the Internet for downloading through a localized printer? What is the function of art as a result of this major change? New technological media have transformed the nature of art, the way it communicates, the way it is distributed or transmitted. With the change of consciousness that accompanies the postmodern electronic era with its new technological tools for representation, the questions challenging artists today deepen and raise new ones: "How did we reach this point? What is the function of art? Is art disembodied communication? To whom am I speaking? How will I act?"

These questions force a confrontation with the legacy of artistic practices and myths rooted in the traditions of contemporary culture. This book is committed to seeking answers to these questions. To find a basis for answers to them and to create a new set of guiding assumptions, we must understand the relationship between technological development and artistic endeavor and how that relationship has profoundly influenced the evolution of culture since the Renaissance.

Vision and art

Vision is one of the most powerful of the senses. Seeing is related to art through a system we call *representation*, a complex term which allows us to examine significant aspects of art practice. Images are not just simple imitations of the world, but are always reordered, refashioned, styled, and coded according to the different conventions which develop out of each medium and its tools – sculpture, painting, printmaking, photography, video, and computer amongst others. However, the way we see is shaped by our worldview, which governs our understanding of what representation is. Thus we can say that representation is a form of ideology because it has inscribed within it all the attitudes we have about our response to images and their assimilation; and about art-making in general, with all its hierarchies of meaning and intentionality.

A useful construct for examining the distinction between vision and representation is provided in an interesting current book by contemporary art historian Svetlana Alpers, *The Art of Describing: Dutch Art in the 17th Century*.[2] Here she compares the differences in attitudes between Dutch and Italian Renaissance artists toward representation. Italian forms of representation were based in the humanistic textual worldview of the Renaissance with its conceptual notions of perfect beauty and poesis. Artists' selections from nature were chosen with an eye to heightened beauty and mathematical harmony – an ordering of what was seen according to the informed choices and judgment of the artist based on particular issues and concepts rather than as a form of representation where the single most important reference is the natural appearance of things. It reflected the views of Plato as articulated in texts such as the *Republic* (Books VI, VII, and X). Plato regarded imagination and vision as inferior capacities, a product of the lowest level of consciousness. He believed that reason allows us to contemplate truth, while the products of vision and imagination can present only false imitations, part of the irrational world of illusion and belief inferior to philosophy and mathematics which he designated as higher forms of knowledge. He illustrated his ideas using the example of a bed, postulating that there are three kinds of beds: one the essential concept of the bed, created by God; then that of a real bed made by a carpenter trying to make ultimate reality; finally, the artist's representation of it which stands removed from its reality. For Plato, human vision and imagination are based in imitation, and thus never able to claim access to divine truth. Plato mistrusted and opposed visuality and imagination through his fear that

various forms of mythology, where life was defined as a series of relationships between human beings and various deities, could become dominant ones. He held that the basis for understanding human existence was through reason and the mind. Imagination and the images produced by it could be trusted only if, first, they were deemed to be imitations, never original; second, they were subordinate to reason; and third, they served the Good and the True. His need to create boundaries around the cultural legitimacy of products of the imagination was meant only as a means of protection for the "greater good." Reflecting Platonic ideals, in its rejection of a visual culture, Italian culture was based in a textual one – a search for truth, meaning, and knowledge.

By contrast, according to Alpers, Dutch seventeenth-century Renaissance painting reflected an acceptance of technologically assisted seeing. Over several epochs in Holland, experiments had been carried on to perfect the accuracy of mechanically assisted means of seeing such as the optical lens. Confidence in technology and cultural acceptance of this form of research into technological visualization in confirming and extending sight through microscopic close-ups, reflections, and distant enhanced views was understood as the way to new and potent forms of knowledge. Such commitment became the basis for a more visually oriented culture based in objective, material reality. Dutch paintings of this period focus on a world seen, a straightforward rendering of everyday life, based on observation, sometimes with the aid of the camera obscura lens, with all the spatial complexity and social detail of real interior views. Meaning in them is not "read" as in Italian painting, but rather the paintings are energized by a system of values in which knowledge of the contemporary external material world is "seen" as a means for understanding.

In this sense, Dutch painting can be said to reflect the views of Aristotle,[3] who was confident about the value and importance of vision and the direct observation of nature and taught that theory must follow fact. In his view, form and matter constitute individual realities (whereas Platonic thought posits that a concrete reality partakes of a form – the ideal – but does not embody it). Aristotle taught that knowledge of a thing beyond its description and classification requires an explanation of "why it is" and posited four principles of explanation: its function; its maker or builder; its design; the substance of which it is made. Also, he characterized imagination as a precondition for reason, describing it as a "mediating sensory experience

Figure 1.2. Albrecht Dürer, *Untitled*, 1538, woodcut.

Artists have always designed their own tools for creating the two-dimensional illusion on paper or canvas of what they see, such as this early grid with a sighting eyepiece.

rather than the experience which Plato thought would lead only toward dangerous illusions."[4] For Aristotle, imagining is based in the visual. Imagination lies between perception and thinking because it is impossible to think without imagining. Picturing in the mind, such as abstract forms or flashes of reality, accompanies abstract ideas, and thinking cannot proceed without such imaginings. Believing that imagination is not only a mediator between sensation and reason, Aristotle understood that it could also rearrange sense perception to form new ideas. It is essential in understanding abstract conceptions that go beyond human experiences of space and time to imagine the future.

Between these two poles of thought, many different positions exist. Even though some Italian artists used optical devices in the production of their work, what they saw was informed by their philosophical attitudes. Reality can be an abstraction depending on the mindset of the artist despite the mechanical device one may be observing through. The distinction we must draw between Dutch and Italian painting lies in the differences between their outlooks and methods inscribed within their worldviews which define their approach to representation. We can draw a comparison between Vermeer's use of the camera obscura and Italian artists such as Bellotto, Guardi, Crespi, Zucarelli, and Canaletto, all of whom used it as an aid in preparing their drawings and paintings.

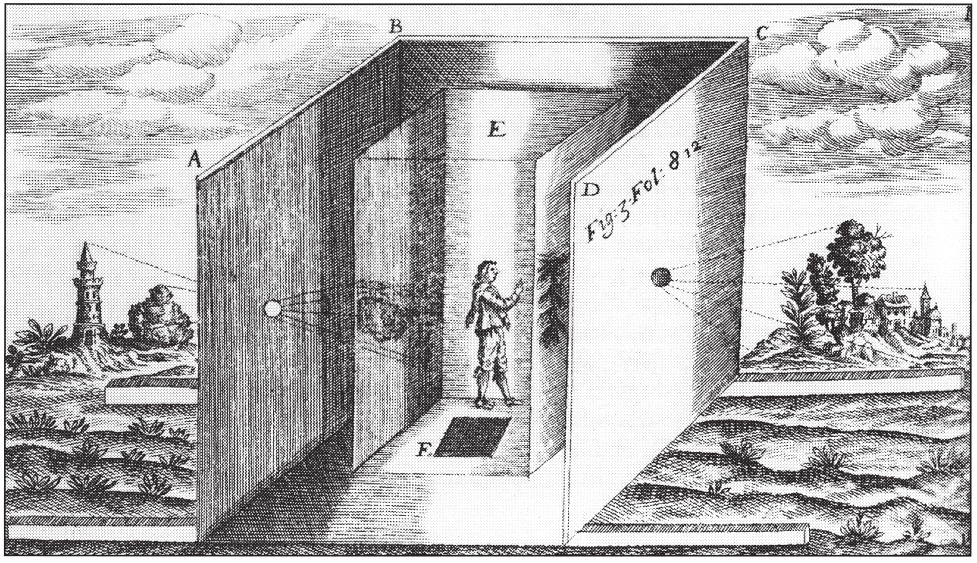


Figure 1.3. Early camera obscura, from A. Kircher, *Ars Magna Lucis et Umbrae*, 1645.

The camera obscura was recorded by Aristotle (384–322 BC) and was well known to Arabs in medieval times. Leonardo described it in his *Codex Atlanticus*: "When the images of illuminated objects pass through a small round hole into a very dark room, if you receive them on a piece of white paper placed vertically in the room at some distance from the aperture, you will see on the paper all those objects in their natural shapes and colors. They will be reduced in size and upside down, owing to the intersection of the rays at the aperture. If these images come from a place which is illuminated by the sun, they will seem as if painted on the paper."

(Collection Boston Athenaeum)

Art historian Charles Seymour has shown that the optical effects in Vermeer's paintings are the direct result of aided viewing and recording of phenomena that could be seen only in conjunction with a camera obscura. Seymour describes Vermeer's *View of Delft*:

> The highlights spread into small circles, and in such images the solidity of the form of a barge for example, is disintegrated in a way that is very close to the well-known effect of circles (or disks) of confusion in optical or photographic terms. This effect results when a pencil of light reflected as a point from an object in nature passes through a lens and is not resolved, or "brought into focus" on a plane set up on the image side of the lens. In order to paint this optical phenomenon, Vermeer must have seen it with direct vision (through the camera obscura) for this is a phenomenon of refracted light.[5]

The aforementioned Italian painters, although known for their use of the camera obscura, simply used the device as a reference tool for placement accuracy without incorporating any of its effects directly into their landscape painting. Considerably more information on the use of mechanical aids in Renaissance painting is now available as a result of the research of British artist David Hockney in his recently published *Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters*.