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Remediation

Understanding New Media

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Like remediation itself, this book has its own genealogy. And like the genealogy of remediation, our book's genealogy is one of historical affiliations or resonances, not of origins. In examining these affiliations, we would begin by noticing "the myriad events through which—thanks to which, against which—they were formed" (Foucault 1977, 146). Indeed, the initial affiliation was our own, which began on the January evening in 1991 when President George Bush ordered the bombing campaign for what has been characterized as the first totally mediated war.

We could also trace the book's descent to the resonances set in motion in September 1994, when one of us (JDB) decided to sit in on the graduate seminar the other (RG) was offering: "The Visual Genealogy of Multimedia." Each of us brought to that course the conception of one of the three genealogical traits that our book traces: JDB the trait of immediacy, which he was beginning to outline in a project whose earliest manifestation appeared on the Internet under the name of "Degrees of Freedom"; RG the trait of hypermediacy, which (operating under the name of multimediacy) provided the organizing logic of the seminar. Remediation itself was our third trait.

We might more precisely trace the book's beginnings to May 1996, when we were completing our first truly collaborative venture, a team-taught version of the original genealogy seminar, in which the contradiction between immediacy and multimediacy formed the organizing principle of the course. It was in May 1996, in a meeting in his office with Sandra Beaudin, that RG was reported to have coined the term *remediation* as a way to complicate the notion of "repurposing" that Beaudin was working with for her class project. But, as most origin stories go, it was not until well after the fact, when Beaudin reported the coinage to JDB, who later reminded RG that he had coined the term, that the concept of "remediation" could be said to have emerged. Indeed although the term *remediation* was coined in RG's office, neither of us really knew what it meant until we had worked out together the double logic of immediacy and hypermediacy.

If *remediation* can be traced to that fateful day in May, the book itself, as a jointly authored collaboration, has its own lineage. The idea of collaborating on an essay was set in play in 1994, during the first genealogy seminar (which ended up being more or less team-taught itself). Almost from the first class meeting, we realized that between us we had grasped something exponentially more powerful than what either of us brought to the table. For more than eighteen months, we

took turns telling each other that we should collaborate on an essay. We passed each other in the hall; we sat in one another's office; we chatted in the faculty lounge or before and after department meetings and lectures. But our daily obligations prevented us from seriously undertaking the project that would eventually become this book. Indeed it was not until the Olympic summer of 1996, when RG was about to embark on a trip to Oxford, to teach in a Georgia Tech summer-abroad program, that the decision to collaborate on an essay was finally made.

It is hardly accidental to the thesis of this book that it was only when we found ourselves on either side of the Atlantic Ocean, communicating with each other through the medium of email, that we were able finally to undertake the collaboration we had been discussing for more than a year. In what was in many senses a reversal of roles, RG found himself traveling through Europe, thinking through the histories of Western art from the medieval period to the present; while JDB was at home in Atlanta, watching the Olympics on TV, thinking through the relations among contemporary media, sports, and the culture of entertainment.

The genealogy of the book is well documented through that summer's emails: as multimediacy evolved into hypermediacy; as the initial idea for an essay (which was published in the fall 1996 issue of *Configurations*) evolved into our plan for a book; and as we began to work through the way in which the concept of remediation helped to make sense of the apparent contradiction between our two logics of mediation. What is also well documented in those emails is the evolution of a mutual friendship and trust, a growing respect and admiration between two very different (indeed in many basic senses opposite) individuals. If we are right in characterizing remediation as reform, then it would be fair to say that among those things that *Remediation* refotmed were ourselves.

We wish to acknowledge here the encouragement and thoughtful critiques that we received from colleagues and friends.

Those with whom we have shared our ideas include Gregory Abowd, Amy Bruckman, Matthew Causey, Sandra Corse, Stuart Culver, Mark Guzdial, N. Katherine Hayles, Henry Jenkins, John Johnston, Dalia Judovitz, Alan Kay, Wendy Kellogg, Irene Klaver, Ken Knoes-pel, George Landow, Candace Lang, Elissa Marder, Robert Markley, Pete McGuire, Rebecca Merrens, Jacob Nielsen, Greg Nobles, Claire Nouvet, Cíaran O'Faoláin, David Porush, Ashwin Ram, Alan Rauch,

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Jim Bono and Kathy Onofrio worked with us on the original essay, "Remediation," which appeared in *Configurations* 3 (Fall 1996): 311–358. We thank them and the journal for allowing us to refashion (if not remediate) material in chapters 1 through 3 of this book.

We thank Lance Strate, Ron Jacobson, and Stephanie Gibson, and the Hampton Press for allowing us to reuse in chapters 15 and 16 of this book material from JDB's "Virtual Reality and the Redefinition of Self" originally published in 1996 in *Communication and Cyberspace: Social Interaction in an Electronic Environment*.

We wish to thank Robert Prior of The MIT Press for his indispensable advice and support. Thanks also to Managing Editor Michael Sims and to those at The MIT Press who put their expertise and enthusiasm into the editing, design, production, and marketing of this book: Julie Grimaldi, Yasuyo Iguchi, Vicki Jennings, Ori Kometani, Terry Lamoureux, Thomas McCorkle, Gita Manaktala, Bev Miller, and Sandra Minkkinen.

Like all other teachers, we have learned much from our students, in particular, those in the graduate program in Information Design and Technology of the School of Literature, Communication, and Culture here at Georgia Tech. Since 1994 we have offered three graduate seminars in the genealogy of new media. In each case, the students in these courses have helped us define and refine our ideas. Also during this period, Kelly Balcom, Rhonda Nelson, Aida Najarian, and Vicky Pickens served as intelligent and enthusiastic research assistants and made a real contribution to the research and production of this book. Our students Michael Koetter, Debbi Faye Levin, and Ian Seymour produced the first *Remediation* video.

David Joseph Bolter provided helpful information on the remediating strategies of animated film. Sarah and Sam Grusin offered important lessons on the inseparability of mediation and reality.

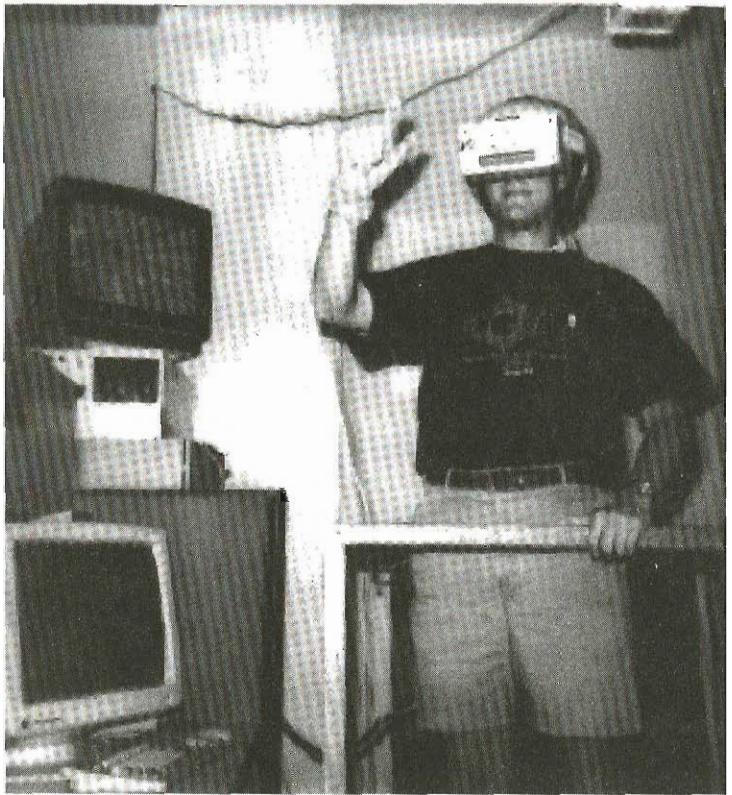
We cannot exaggerate the contribution made by Lori Levy, who took on the important task of helping us locate, interpret, and present the various graphic images that appear in this book. To this task, she

Introduction: The Double Logic of Remediation

"This is not like TV only better," says Lenny Nero in the futuristic film *Strange Days*. "This is life. It's a piece of somebody's life. Pure and uncut, straight from the cerebral cortex. You're there. You're doing it, seeing it, hearing it . . . feeling it." Lenny is touting to a potential customer a technological wonder called "the wire." When the user places the device over her head, its sensors make contact with the perceptual centers in her brain. In its recording mode, the wire captures the sense perceptions of the wearer; in its playback mode, it delivers these recorded perceptions to the wearer. If the ultimate purpose of media is indeed to transfer sense experiences from one person to another, the wire threatens to make all media obsolete. Lenny mentions television, but the same critique would seem to apply to books, paintings, photographs, film, and so on. The wire bypasses all forms of mediation and transmits directly from one consciousness to another.

The film *Strange Days* is less enthusiastic about the wire than Lenny and his customers. Although the wire embodies the desire to get beyond mediation, *Strange Days* offers us a world fascinated by the power and ubiquity of media technologies. Los Angeles in the last two days of 1999, on the eve of "2K," is saturated with cellular phones, voice- and text-based telephone answering systems, radios, and billboard-sized television screens that constitute public media spaces. In this media-filled world, the wire itself is the ultimate mediating technology, despite—or indeed because of—the fact that the wire is designed to efface itself, to disappear from the user's consciousness. When Lenny coaches the "actors" who will appear in a pornographic recording, it becomes clear that the experience the wire offers can be as contrived as a traditional film. Although Lenny insists that the wire is

Figure I.1 A virtual reality head-mounted display. Courtesy of Professor Larry Hodges, GVU Center, Georgia Institute of Technology.



“not TV only better,” the film ends up representing the wire as “film only better.” When Lenny himself puts on the wire and closes his eyes, he experiences the world in a continuous, first-person point-of-view shot, which in film criticism is called the “subjective camera.”

Strange Days captures the ambivalent and contradictory ways in which new digital media function for our culture today. The film projects our own cultural moment a few years into the future in order to examine that moment with greater clarity. The wire is just a fanciful extrapolation of contemporary virtual reality, with its goal of unmediated visual experience. The contemporary head-mounted display of virtual reality is considerably less comfortable and fashionable (fig. I.1), and the visual world it generates is far less compelling. Still, contemporary virtual reality is, like the wire in *Strange Days*, an experiment in cinematic point of view. Meanwhile, the proliferation of media in 2K L.A. is only a slight exaggeration of our current media-rich environment, in which digital technologies are proliferating faster than our

cultural, legal, or educational institutions can keep up with them. In addressing our culture's contradictory imperatives for immediacy and hypermediacy, this film demonstrates what we call a double logic of *remediation*. Our culture wants both to multiply its media and to erase all traces of mediation: ideally, it wants to erase its media in the very act of multiplying them.

In this last decade of the twentieth century, we are in an unusual position to appreciate remediation, because of the rapid development of new digital media and the nearly as rapid response by traditional media. Older electronic and print media are seeking to reaffirm their status within our culture as digital media challenge that status. Both new and old media are invoking the twin logics of immediacy and hypermediacy in their efforts to remake themselves and each other. To fulfill our apparently insatiable desire for immediacy, "live" point-of-view television programs show viewers what it is like to accompany a police officer on a dangerous raid or to be a skydiver or a race car driver hurtling through space. Filmmakers routinely spend tens of millions of dollars to film on location or to recreate period costumes and places in order to make their viewers feel as if they were "really" there. "Webcams" on the Internet pretend to locate us in various natural environments—from a backyard bird feeder in Indianapolis (Fig. I.2) to a panorama in the Canadian Rockies (Fig. I.3). In all these cases, the logic

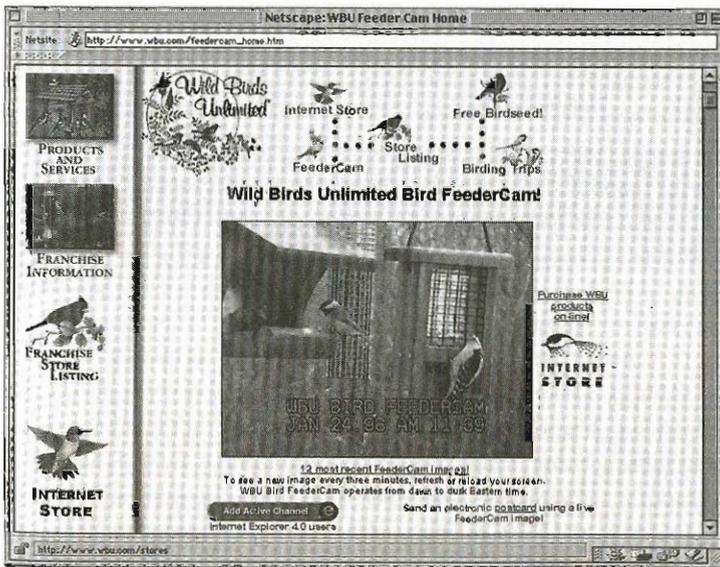
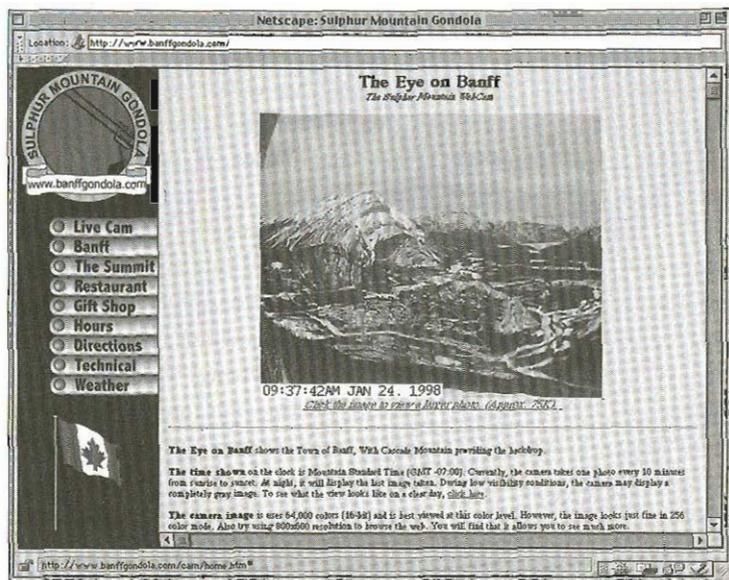


Figure I.2 Bird feeder webcam: the view is updated every three minutes. http://www.wbu.com/feedercam_home.htm January 24, 1998. © 1997, Wild Birds Unlimited. All rights reserved. Used by permission.

Figure I.3 Sulphur Mountain webcam, providing a repeatedly updated view of a mountain in the Canadian Rockies in Banff, Alberta. <http://www.banffgondola.com/> January 24, 1998. © 1998, Sulphur Mountain Gondola. All rights reserved. Used by permission.



of immediacy dictates that the medium itself should disappear and leave us in the presence of the thing represented: sitting in the race car or standing on a mountaintop.

Yet these same old and new media often refuse to leave us alone. Many web sites are riots of diverse media forms—graphics, digitized photographs, animation, and video—all set up in pages whose graphic design principles recall the psychedelic 1960s or dada in the 1910s and 1920s (Fig. I.4; Fig. I.5). Hollywood films, such as *Natural Born Killers* and *Strange Days*, mix media and styles unabashedly. Televised news programs feature multiple video streams, split-screen displays, composites of graphics and text—a welter of media that is somehow meant to make the news more perspicuous. Even webcams, which operate under the logic of immediacy, can be embedded in a hypermediated web site (Fig. I.6), where the user can select from a “jukebox” of webcam images to generate her own paneled display.

As the webcam jukebox shows, our two seemingly contradictory logics not only coexist in digital media today but are mutually dependent. Immediacy depends on hypermediacy. In the effort to create a seamless moving image, filmmakers combine live-action footage with computer compositing and two- and three-dimensional computer graphics. In the effort to be up to the minute and complete, television

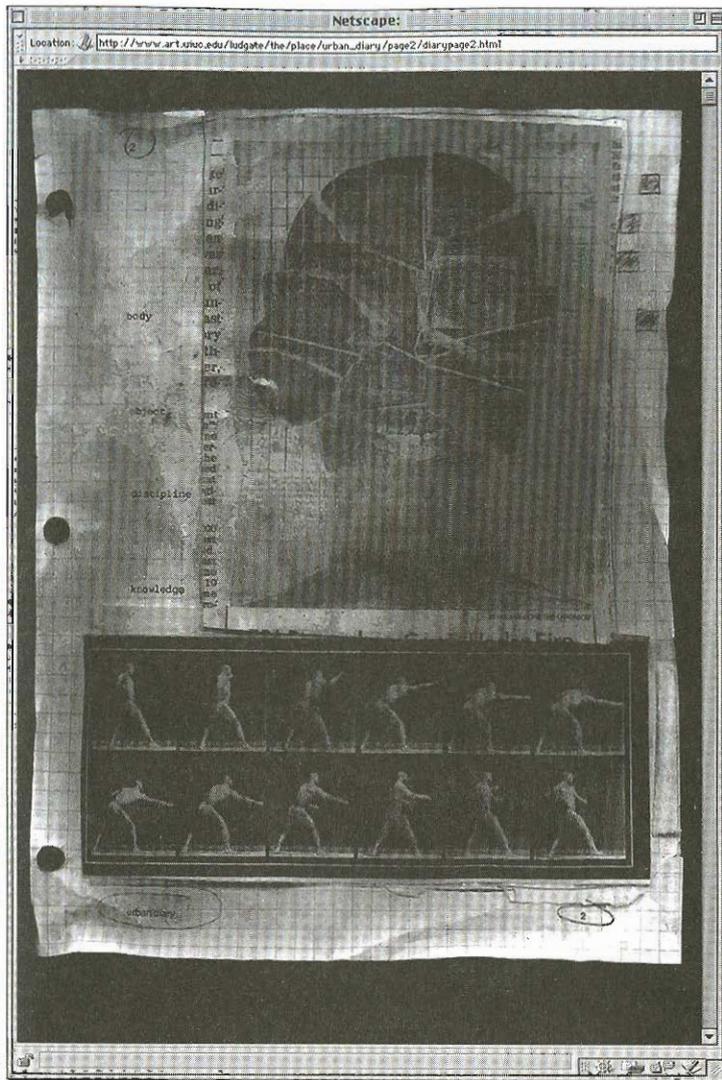


Figure I.4 A page from Joseph Squire's *Urban Diary*. http://gertrude.art.uiuc.edu/ludgate/the/place/urban_diary/intro.html January 24, 1998. © 1995 Urban Desires. Used by permission.

Figure I.5 An image from the RGB Gallery at the Hotwired web site: a collection of digital art. <http://www.hotwired.com/rgb/opp/> ++++++ January 24, 1998. © 1994–1998 Wired Digital, Inc. All rights reserved.

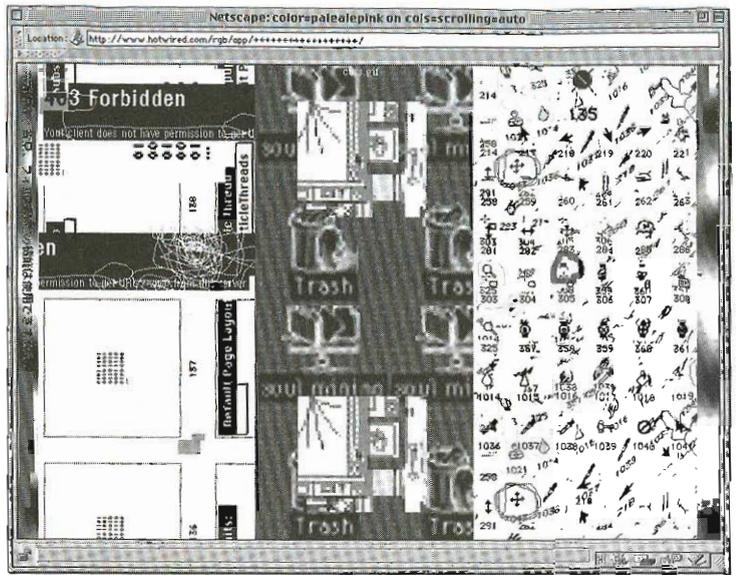


Figure I.6 This webcam jukebox allows the user to combine three individual webcams of her choosing. <http://wct.images.com/jukebox> January 29, 1998. © 1998, Kamal A. Mostafa. All rights reserved. Used by permission.

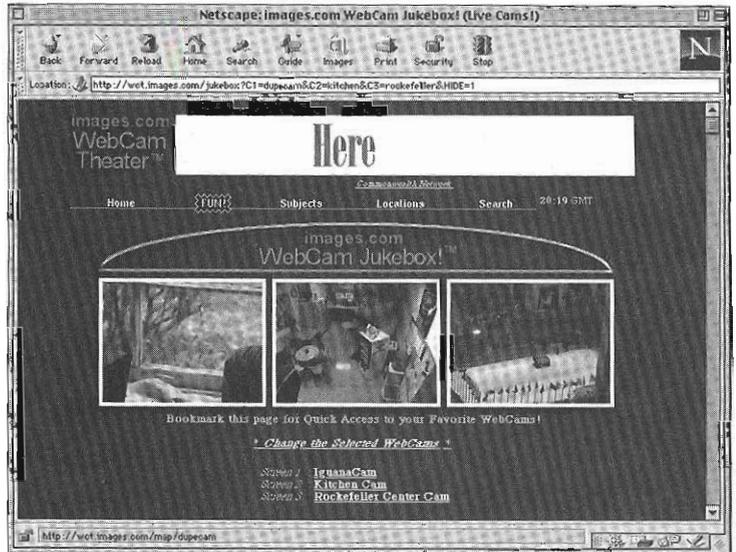




Figure I.7 The CNN Interactive web site. © 1998 Cable News Network, Inc. All rights reserved. Used by permission of CNN.

news producers assemble on the screen ribbons of text, photographs, graphics, and even audio without a video signal when necessary (as was the case during the Persian Gulf War). At the same time, even the most hypermediated productions strive for their own brand of immediacy. Directors of music videos rely on multiple media and elaborate editing to create an immediate and apparently spontaneous style; they take great pains to achieve the sense of “liveness” that characterizes rock music. The desire for immediacy leads digital media to borrow avidly from each other as well as from their analog predecessors such as film, television, and photography. Whenever one medium seems to have convinced viewers of its immediacy, other media try to appropriate that conviction. The CNN site is hypermediated—arranging text, graphics, and video in multiple panes and windows and joining them with numerous hyperlinks; yet the web site borrows its sense of immediacy from the televised CNN newscasts. At the same time televised newscasts are coming to resemble web pages in their hypermediacy (fig. I.7 and I.8). The team of web editors and designers, working in the same building in Atlanta from which the television news networks are also administered, clearly want their technology to be “television only better.” Similarly,

Figure 1.8 CNN Headline News.
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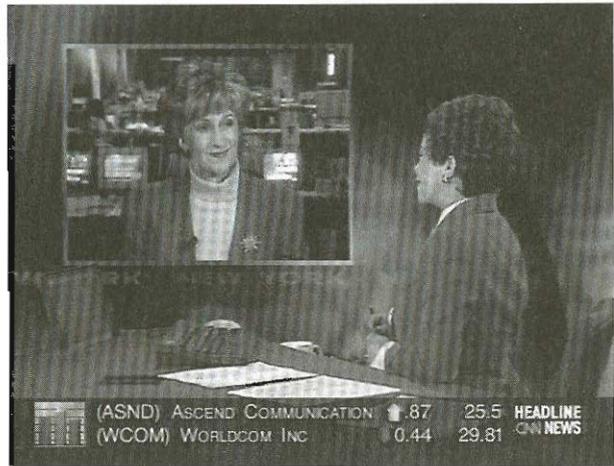
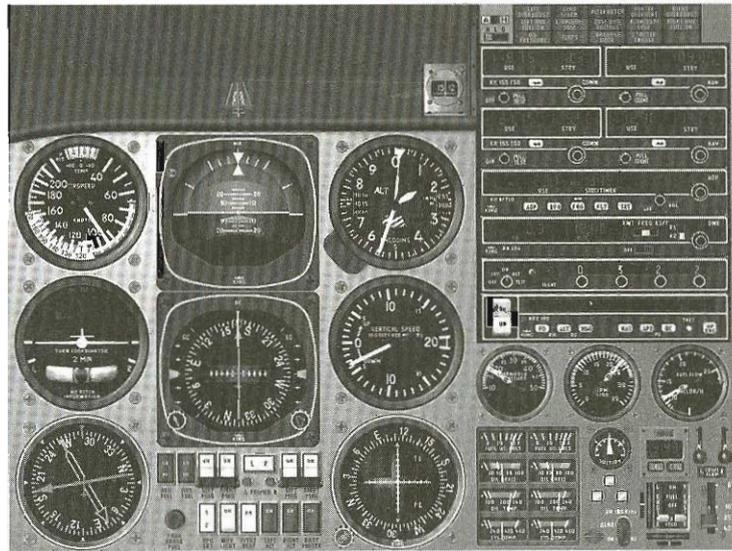


Figure 1.9 Photorealistic Piper Seneca III Module: the interface for a flight simulator. © 1998 Initiative Computing AG, Switzerland. Reprinted with permission.



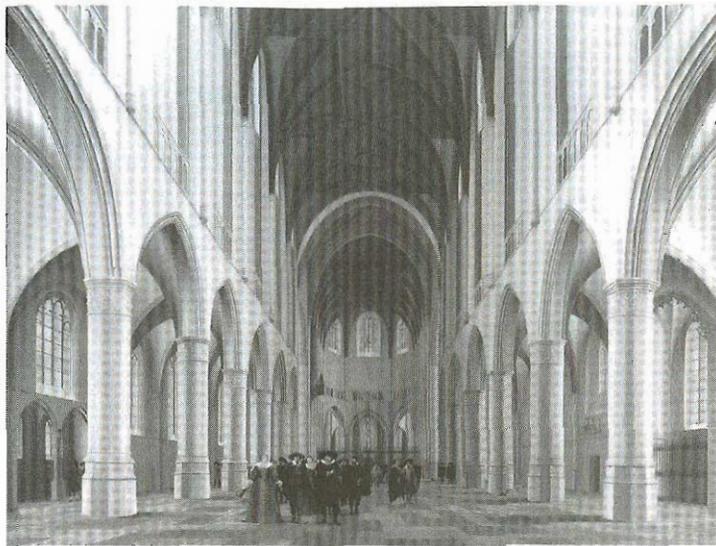
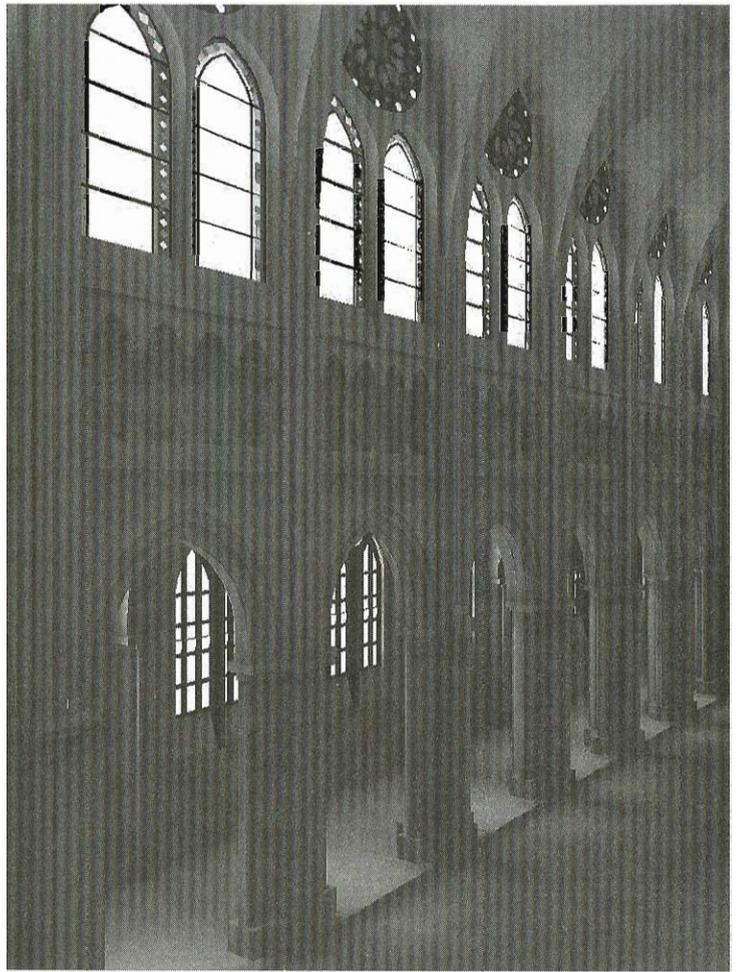


Figure I.10 Saenredam, Pieter Jansz. "S. Bavo in Haarlem" 1631. The John G. Johnson Collection, Philadelphia Museum of Art. Used by permission.

one of the most popular genres of computer games is the flight simulator (fig. I.9). The action unfolds in real time, as the player is required to monitor the instruments and fly the plane. The game promises to show the player "what it is like to be" a pilot, and yet in what does the immediacy of the experience consist? As in a real plane, the simulated cockpit is full of dials to read and switches to flip. As in a real plane, the experience of the game is that of working an interface, so that the immediacy of this experience is pure hypermediacy.

Remediation did not begin with the introduction of digital media. We can identify the same process throughout the last several hundred years of Western visual representation. A painting by the seventeenth-century artist Pieter Saenredam, a photograph by Edward Weston, and a computer system for virtual reality are different in many important ways, but they are all attempts to achieve immediacy by ignoring or denying the presence of the medium and the act of mediation. All of them seek to put the viewer in the same space as the objects viewed. The illusionistic painter employs linear perspective and "realistic" lighting (fig. I.10), while the computer graphics specialist mathematizes linear perspective and creates "models" of shading and illumination (fig. I.11; plate 1). Furthermore, the goal of the computer graphics specialists is to do as well as, and eventually better than, the painter or even the photographer.

Figure I.11 A photorealistic computer graphic: the nave of Chartres Cathedral, by John Wallace and John Lin. © 1989, Hewlett-Packard Co. Used by permission.



Like immediacy, hypermediacy also has its history. A medieval illuminated manuscript, a seventeenth-century painting by David Bailly, and a buttoned and windowed multimedia application are all expressions of a fascination with media. In medieval manuscripts, the large initial capital letters may be elaborately decorated, but they still constitute part of the text itself, and we are challenged to appreciate the integration of text and image (fig. I.12; plate 2). In many multimedia applications, icons and graphics perform the same dual role (as in figure I.13; plate 3), in which the images peek out at us through the word ARKANSAS. This dual role has a history in popular graphic design, as a



Figure I.12 A page from a Book of Hours, circa 1450. © Robert W. Woodruff Library, Emory University. Used by permission.

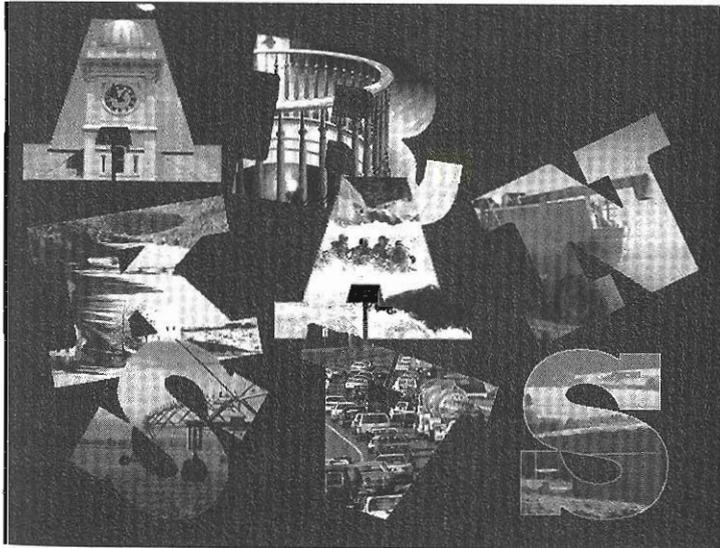


Figure I.13 Arkansas: the splash (opening) screen for a multimedia celebration of the state.

Figure I.14 A Coney Island postcard from the 1910s. <http://naid.spsr.ucla.edu/coneyisland/histarc.htm> January 24, 1998.



postcard of Coney Island from the early twentieth-century shows (fig. I.14). Today as in the past, designers of hypermediated forms ask us to take pleasure in the act of mediation, and even our popular culture does take pleasure. Some hypermediated art has been and remains an elite taste, but the elaborate stage productions of many rock stars are among many examples of hypermediated events that appeal to millions.

In the chapters that follow, we examine the process of remediation in contemporary media. In part I, we place the concept of remediation within the traditions of recent literary and cultural theory. Readers who are less interested in theory may want to turn directly to part II, which illustrates the work of remediation in such media as computer graphics, film, television, the World Wide Web, and virtual reality. These illustrative chapters should make sense even without the fuller explanations of transparent immediacy, hypermediacy, and remediation provided in part I. In part III, which is again more theoretical, we consider how new digital media are participating in our culture's redefinition of self. Because readers may choose not to read the book in linear order, we have provided references—the printed equivalent of hyperlinks—to connect points made in the theoretical chapters with examples in the illustrative chapters, as well as some references from each illustrative chapter to others. This link directs the reader to part II. **p. 85**

Our primary concern will be with visual technologies, such as computer graphics and the World Wide Web. We will argue that these new media are doing exactly what their predecessors have done: pre-

senting themselves as refashioned and improved versions of other media. Digital visual media can best be understood through the ways in which they honor, rival, and revise linear-perspective painting, photography, film, television, and print. No medium today, and certainly no single media event, seems to do its cultural work in isolation from other media, any more than it works in isolation from other social and economic forces. What is new about new media comes from the particular ways in which they refashion older media and the ways in which older media refashion themselves to answer the challenges of new media.

I Theory

In part I we explain in greater detail the theory and history of remediation. Like other media since the Renaissance—in particular, perspective painting, photography, film, and television—new digital media oscillate between immediacy and hypermediacy, between transparency and opacity. This oscillation is the key to understanding how a medium refashions its predecessors and other contemporary media. Although each medium promises to reform its predecessors by offering a more immediate or authentic experience, the promise of reform inevitably leads us to become aware of the new medium as a medium. Thus, immediacy leads to hypermediacy. The process of remediation makes us aware that all media are at one level a “play of signs,” which is a lesson that we take from poststructuralist literary theory. At the same time, this process insists on the real, effective presence of media in our culture. Media have the same claim to reality as more tangible cultural artifacts; photographs, films, and computer applications are as real as airplanes and buildings.

Furthermore, media technologies constitute networks or hybrids that can be expressed in physical, social, aesthetic, and economic terms. Introducing a new media technology does not mean simply inventing new hardware and software, but rather fashioning (or refashioning) such a network. The World Wide Web is not merely a software protocol and text and data files. It is also the sum of the uses to which this protocol is now being put: for marketing and advertising, scholarship, personal expression, and so on. These uses are as much a part of the technology as the software itself. For this reason, we can say that media technologies are agents in our culture without falling into the trap of technological determinism. New digital media are not external agents that come to disrupt an unsuspecting culture. They emerge from within cultural contexts, and they refashion other media, which are embedded in the same or similar contexts.

Immediacy, Hypermediacy, and Remediation

1

The two logics of remediation have a long history, for their interplay defines a genealogy that dates back at least to the Renaissance and the invention of linear perspective. We do not claim that immediacy, hypermediacy, and remediation are universal aesthetic truths; rather, we regard them as practices of specific groups in specific times.¹ Although the logic of immediacy has manifested itself from the Renaissance to the present day, each manifestation in each age may be significantly different, and immediacy may mean one thing to theorists, another to practicing artists or designers, and a third to viewers. The diversity is even greater for hypermediacy, which seems always to offer a number of different reactions to the contemporary logic of immediacy. Remediation always operates under the current cultural assumptions about immediacy and hypermediacy.

We cannot hope to explore the genealogy of remediation in detail. What concerns us is remediation in our current media in North America, and here we can analyze specific images, texts, and uses. The historical resonances (to Renaissance painting, nineteenth-century photography, twentieth-century film, and so on) will be offered to help explain the contemporary situation. At the same time, the practices of contemporary media constitute a lens through which we can view the history of remediation. What we wish to highlight from the past is what resonates with the twin preoccupations of contemporary media: the transparent presentation of the real and the enjoyment of the opacity of media themselves.

THE LOGIC OF TRANSPARENT IMMEDIACY

Virtual reality is immersive, which means that it is a medium whose purpose is to disappear. This disappearing act, however, is made diffi-

1. Our notion of genealogy is indebted to Foucault's, for we too are looking for historical affiliations or resonances and not for origins. Foucault (1977) characterized genealogy as "an examination of descent," which "permits the discovery, under the unique aspect of a trait or a concept, of the myriad events through which—thanks to which, against which—they were formed" (146). Our genealogical traits will be immediacy, hypermediacy, and remediation; however, where Foucault was concerned with relations of power, our proposed genealogy is defined by the formal relations within and among media as well as by relations of cultural power and prestige.

cult by the apparatus that virtual reality requires. In *Strange Days*, users of the wire had only to put on a slender skullcap, but in today's virtual reality systems, the viewer must wear a bulky head-mounted display, a helmet with eyepieces for each eye (fig. I.1). In other systems known as "caves," the walls (and sometimes the floor and ceiling) are themselves giant computer screens. Although less subtle than the wire, current virtual reality systems also surround the viewer with a computer-generated image. With the head-mounted display in particular, virtual reality is literally "in the viewer's face." The viewer is given a first-person point of view, as she gazes on a graphic world from a station point that is always the visual center of that world. As computer scientists themselves put it, the goal of virtual reality is to foster in the viewer a sense of presence: the viewer should forget that she is in fact wearing a computer interface and accept the graphic image that it offers as her own visual world (Hodges et al. 1994).

In order to create a sense of presence, virtual reality should come as close as possible to our daily visual experience. Its graphic space should be continuous and full of objects and should fill the viewer's field of vision without rupture. But today's technology still contains many ruptures: slow frame rates, jagged graphics, bright colors, bland lighting, and system crashes. Some of these ruptures are apparent even in the single static images that we see, for example, in figures 9.1, 9.2, and 9.3. We notice immediately the cartoon-like simplicity of the scene, which no user could confuse with the world that greets her when she takes off the helmet. For the enthusiasts of virtual reality, however, today's technological limitations simply point to its great potential, which for them lies in a future not much further removed than *Strange Days*. In fact, Lenny Nero's words could almost have been written by these enthusiasts. In his book on virtual reality, Howard Rheingold (1991) claims that "at the heart of VR [virtual reality] is an experience—the experience of being in a virtual world or remote location" (46). Jaron Lanier, a developer of one of the first commercial virtual reality systems, suggests that in virtual reality "you can visit the world of the dinosaur, then become a Tyrannosaurus. Not only can you see DNA, you can experience what it's like to be a molecule" (quoted in Ditlea 1989, 97). Meredith Bricken (1991), an interface designer, writes that in a virtual environment, "You can be the mad harter or you can be the teapor; you can move back and forth to the rhythm of a song. You can be a tiny droplet in the rain or in the river" (372). All of these enthusiasts promise us transparent, perceptual immediacy, experience

without mediation, for they expect virtual reality to diminish and ultimately to deny the mediating presence of the computer and its interface. Bricken's work is, in fact, entitled "Virtual Worlds: No Interface to Design."

The logic of transparent immediacy is also at work in nonimmersive digital graphics—that is, in two- and three-dimensional images projected on to traditional computer, film, or television screens. Digital graphics have become tremendously popular and lucrative and in fact are leading to a new cultural definition of the computer. If even ten years ago we thought of computers exclusively as numerical engines and word processors, we now think of them also as devices for generating images, reworking photographs, holding videoconferences, and providing animation and special effects for film and television. With these new applications, the desire for immediacy is apparent in claims that digital images are more exciting, lively, and realistic than mere text on a computer screen and that a videoconference will lead to more effective communication than a telephone call. The desire for immediacy is apparent in the increasing popularity of the digital compositing of film and in Hollywood's interest in replacing stunt men and eventually even actors with computer animations. And it is apparent in the triumph of the graphical user interface (GUI) for personal computers. The desktop metaphor, which has replaced the wholly textual command-line interface, is supposed to assimilate the computer to the physical desktop and to the materials (file folders, sheets of paper, inbox, trash basket, etc.) familiar to office workers. The mouse and the pen-based interface allow the user the immediacy of touching, dragging, and manipulating visually attractive ideograms. Immediacy is supposed to make this computer interface "natural" rather than arbitrary. And although the standard desktop interface has been two-dimensional, designers are experimenting with three-dimensional versions—virtual spaces in which the user can move in, around, and through information (Card, Robertson, and Macinlay 1991). These three-dimensional views are meant to lend even greater immediacy to the experience of computing. What designers often say they want is an "interfaceless" interface, in which there will be no recognizable electronic tools—no buttons, windows, scroll bars, or even icons as such. Instead the user will move through the space interacting with the objects "naturally," as she does in the physical world. Virtual reality, three-dimensional graphics, and graphical interface design are all seeking to make digital technology "transparent." In this sense, a transparent in-

2. See also Martin Jay (1993, 69–82). Unlike Jay, Samuel Edgerton (1975) not only documents a connection between the mathematization of space and linear perspective, but seems to accept it as true. Bruno Latour (1990) also remarks on the significance of perspectivalism. Building on William Ivin's study, *On the Rationalization of Sight* (1973), Latour argues that by mathematizing space, linear perspective enabled visual representations to be transported from one context to another without being altered or distorted. By manipulating these "immutable mobiles," practitioners of linear perspective could in effect manipulate the world itself, because the mathematization of space makes the context or medium transparent and provides immediate access to the world. See Latour (1987, chap. 6, 1990).

terface would be one that erases itself, so that the user is no longer aware of confronting a medium, but instead stands in an immediate relationship to the contents of that medium.

The transparent interface is one more manifestation of the need to deny the mediated character of digital technology altogether. To believe that with digital technology we have passed beyond mediation is also to assert the uniqueness of our present technological moment. For many virtual reality enthusiasts, the computer so far surpasses other technologies in its power to make the world present that the history of earlier media has little relevance. Even those, like Rheingold, who do acknowledge technological precursors (particularly film and television) still emphasize the novelty of virtual reality. Their view is that virtual reality (or digital technology in general) completes and overcomes the history of media. In *Strange Days*, the wire is the last and most powerful technology created before the end of the millennium. However, the desire for immediacy itself has a history that is not easily overcome. At least since the Renaissance, it has been a defining feature of Western visual (and for that matter verbal) representation. To understand immediacy in computer graphics, it is important to keep in mind the ways in which painting, photography, film, and television have sought to satisfy this same desire. These earlier media sought immediacy through the interplay of the aesthetic value of transparency with techniques of linear perspective, erasure, and automaticity, all of which are strategies also at work in digital technology.

As Albrecht Dürer noted, and as Panofsky (1991) reminded us in *Perspective as Symbolic Form* (27), *perspective* means a "seeing through," and, like the interface designers of today, students of linear perspective promised immediacy through transparency. They trusted in linear perspective to achieve transparency because by mathematizing space, it used the "right" technique to measure the world. Martin Jay and others have argued for a close connection between Albertian perspective and Descartes's spatial mathematics. For Jay (1988), "Cartesian perspectivalism" constituted a peculiar way of seeing that dominated Western culture from the seventeenth century to the early twentieth by allowing the Cartesian subject to control space from a single vantage point.² By using projective geometry to represent the space beyond the canvas, linear perspective could be regarded as the technique that effaced itself as technique. As Alberti (1972) expressed it in his treatise *On Painting*, "On the surface on which I am going to paint, I draw a rectangle of whatever size I want, which I regard as an open window through which

the subject to be painted is seen”(55). If executed properly, the surface of the painting dissolved and presented to the viewer the scene beyond. To achieve transparency, however, linear perspective was regarded as necessary but not sufficient, for the artist must also work the surface to erase his brush strokes. Norman Bryson (1983) has argued that “through much of the Western tradition oil paint is treated primarily as an *erasive* medium. What it must first erase is the surface of the picture-plane” (92). Erasing the surface in this way concealed and denied the process of painting in favor of the perfected product. Although effacement is by no means universal in Western painting, even before the nineteenth century, it was one important technique for making the space of the picture continuous with the viewer’s space. This continuity between depicted and “real” space was particularly apparent in *trompe l’oeil* art—for example, in ceilings where the painting continues the architecture of the building itself (Kemp 1990). The irony is that it was hard work to make the surface disappear in this fashion, and in fact the artist’s success at effacing his process, and thereby himself, became for trained viewers a mark of his skill and therefore his presence.

A third strategy for achieving transparency has been to automate the technique of linear perspective. This quality of automaticity has been ascribed to the technology of the camera obscura and subsequently to photography, film, and television. In the most familiar story of the development of Western representation, the invention of photography represented the perfection of linear perspective. (For a revisionist view, see Crary 1990.) A photograph could be regarded as a perfect Albertian window. André Bazin (1980) expressed this view with untroubled certainty: “The decisive moment [in Western painting] undoubtedly came with the discovery of the first scientific and already, in a sense, mechanical systems of reproduction, namely, perspective: the camera obscura of da Vinci foreshadowed the camera of Niepce. The artist was now in a position to create the illusion of three-dimensional space within which things appeared to exist as our eyes in reality see them” (239). Photography was a mechanical and chemical process, whose automatic character seemed to many to complete the earlier trend to conceal both the process and the artist. In fact, photography was often regarded as going too far in the direction of concealing the artist by eliminating him altogether. In the nineteenth and early twentieth centuries, this question was extensively debated. Was photography an art? Did it make painting and painters unnecessary? And so on (Trachtenberg 1980, vii–xiii). In examining automatic reproduction

3. A similar argument could be made for television, especially for the “live” coverage of news and sporting events, which promise immediacy through their real-time presentation. In “The Fact of Television,” Stanley Cavell has described what he calls the “monitoring” function of television. The case for immediacy in film is complicated by the intervention of the director and the editor, but film is still experienced as immediate during the time of its showing—an immediacy that greatly troubled Christian Metz (1977).

and the artist as a creative agent, Stanley Cavell (1979) expanded on and revised Bazin: “Photography overcame subjectivity in a way undreamed of by painting, a way that could not satisfy painting, one which does not so much defeat the act of painting as escape it altogether: by automatism, by removing the human agent from the task of reproduction” (23). For both Bazin and Cavell, photography offered its own route to immediacy. The photograph was transparent and followed the rules of linear perspective; it achieved transparency through automatic reproduction; and it apparently removed the artist as an agent who stood between the viewer and the reality of the image.³

Bazin (1980) concluded that “photography and the cinema . . . are discoveries that satisfy, once and for all and in its very essence, our obsession with realism,” yet he was certainly wrong. These two visual technologies did not satisfy our culture’s desire for immediacy (240). Computer graphics has become the latest expression of that desire, and its strategy for achieving immediacy owes something to several earlier traditions. William J. Mitchell (1994) claims, “The tale of computer image synthesis in the 1970s and 1980s . . . strikingly recapitulates the history of European painting from the miracle of Masaccio’s *Trinity* to the birth of photography. . . . Synthesized images can now be virtually point-for-point matches to photographs of actual scenes, and there is experimental evidence that, for certain sorts of scenes, observers cannot distinguish these images from photographs” (161). But even if we cannot always tell synthesized images from photographs, we can distinguish the different strategies that painting and photography have adopted in striving for immediacy, and we can explore how digital graphics borrows and adapts each of these strategies.

Digital graphics extends the tradition of the Albertian window. It creates images in perspective, but it applies to perspective the rigor of contemporary linear algebra and projective geometry (Foley et al. 1996, 229–283). Computer-generated projective images are mathematically perfect, at least within the limits of computational error and the resolution of the pixelated screen. Renaissance perspective was never perfect in this sense, not only because of hand methods, but also because the artists often manipulated the perspective for dramatic or allegorical effect (Elkins 1994; Kemp 1990, 20, 47–49; Hagen 1986). (Of course, digital graphic perspective can be distorted too, but even these distortions are generated mathematically.) Computer graphics also expresses color, illumination, and shading in mathematical terms (Foley et al. 1996, 563–604, 721–814), although so far less success-

fully than perspective. So, as with perspective painting, when computer graphics lays claim to the real or the natural, it seems to be appealing to the Cartesian or Galilean proposition that mathematics is appropriate for describing nature.

Furthermore, to Cartesian geometry computer graphics adds the algorithmic mathematics of John von Neumann and Alan Turing. Computer programs may ultimately be human products, in the sense that they embody algorithms devised by human programmers, but once the program is written and loaded, the machine can operate without human intervention. Programming, then, employs erasure or effacement, much as Norman Bryson defines erasure for Western painting, or as Cavell and others describe the erasure of human agency from the production of photographs.⁴ Programmers seek to remove the traces of their presence in order to give the program the greatest possible autonomy. In digital graphics, human programmers may be involved at several levels. The computer operating systems are written by one group of specialists; graphics languages, such as Open GL, are written by others; and applications are programs that exploit the resources offered by languages and operating systems. All of these classes of programmers are simultaneously erased at the moment in which the computer actually generates an image by executing the instructions they have collectively written.

The fact that digital graphics is automatic suggests an affinity to photography. In both cases, the human agent is erased, although the techniques of erasure are rather different. With photography, the automatic process is mechanical and chemical. The shutter opens, and light streams in through the lens and is focused on a chemical film. The process of recording itself is holistic, with no clearly defined parts or steps. For this reason, many in the nineteenth century could regard light or nature itself as the painter. Talbot did so in his book *The Pencil of Nature* (1969), and Niepce did as well, when he wrote that "the Daguerrotype is not merely an instrument which serves to draw Nature; on the contrary it is a chemical and physical process which gives her the power to reproduce herself" (Trachtenberg 1980, 13; see also Jussim 1983, 50). In digital graphics, however, it is not easy to regard the program as a natural product, except in the sense that nature steers the electrons inside the computer chips. Digital graphic images are the work of humans, whose agency, however, is often deferred so far from the act of drawing that it seems to disappear. This deferral is especially important in real-time animation and virtual reality, where the computer is draw-

4. Computer graphics, representational painting, and traditional photography efface the visible signs of agency; an American abstract artist like Rauschenberg, however, seeks to efface the act of erasure itself. (See Fisher 1991, 98–99.)

ing ten or twenty frames per second, all without the programmer's intervention. The automatic or deferred quality of computer programming promotes in the viewer a sense of immediate contact with the image.

Experts on computer graphics often say that they are striving to achieve "photorealism"—in other words, to make their synthetic images indistinguishable from photographs. **p. 119** This comparison may take the explicit form of putting a photograph side by side with a synthetic digital image. In such cases the computer is imitating not an external reality but rather another medium. (We argue later that this is all *any* new technology could do: define itself in relationship to earlier technologies of representation.) To achieve photorealism, the synthetic digital image adopts the criteria of the photograph. It offers a single station point, a monocular point of view, and a photographic sense of appropriate composition. Computer graphics experts do not in general imitate "poor" or "distorted" photographs (exotic camera angles or lighting effects), precisely because these distorted photographs, which make the viewer conscious of the photographic process, are themselves not regarded as realistic or immediate. Thus, photographs and synthetic images achieve the same effect of erasure through different means. The photograph erases the human subject through the mechanics and chemistry of lens, shutter, and film. Digital graphics erases the subject algorithmically through the mathematics of perspective and shading embodied in a program. So-called digital photography is a hybrid that combines and reconfigures these two kinds of automaticity.

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Obviously the test of photorealism can apply only to single, static images. The equivalent for computer animation would be "filmic" realism: a sequence of computer images that could not be distinguished from a traditional film, a feat that is technically even more challenging than photorealism. However, the very fact that the images are in motion (in computer animation and virtual reality) suggests new strategies for achieving immediacy. If immediacy is promoted by removing the programmer/creator from the image, it can also be promoted by involving the viewer more intimately in the image. The production of computer animation seems to be automatic, yet the viewing can be interactive, although the interaction may be as simple as the capacity to change one's point of view. In painting and photography, the user's point of view was fixed. In film and television, the point of view was set in motion, but it was the director or editor who controlled

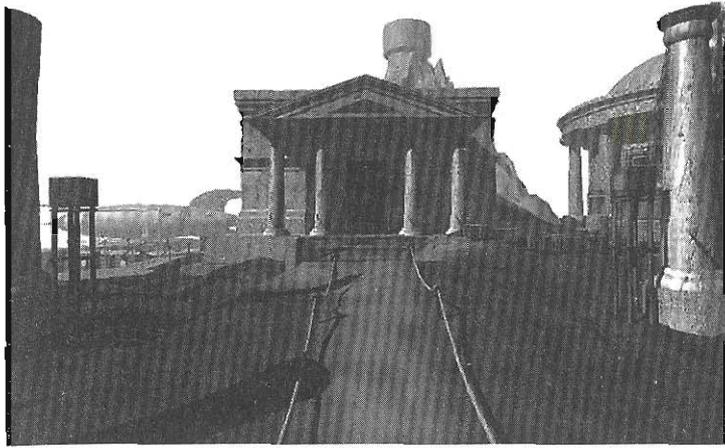


Figure 1.1. A view of *Myst* island.
© 1993 Cyan Inc. *Myst* ® Cyan
Inc. All rights reserved.

the movement. Now, computer animation can function like film in this respect, for it too can present a sequence of predetermined camera shots. However, the sequence can also be placed under the viewer's control, as it is in animated computer video games or virtual reality.

In virtual reality, the helmet that contains the eyepieces also typically contains a tracking device. As the viewer turns her head, the tracker registers the change in her orientation, and the computer redraws the image in each eyepiece to match her new perspective. Because she can move her head, the viewer can see that she is immersed—that she has jumped through Alberti's window and is now inside the depicted space. For virtual reality enthusiasts, the plane defined by the video screen on the outmoded desktop computer is like Alberti's window, and it is this plane that virtual reality now shatters. Rheingold (1991) claims that "in the 1990s, VR technology is taking people beyond and through the display screen into virtual worlds" (75). As Rheingold implies, in graphics delivered on a conventional video screen, for example, in computer games, the interface is more obtrusive. The viewer must use the mouse or the keyboard to control what she sees. Yet even here, the viewer can manipulate her point of view and may still have a feeling of immersion, especially if she can turn in a full circle. It is remarkable how easily a player can project herself into a computer game like *Myst*, *Riven*, or *Doom*, despite the relatively low resolution and limited field of view afforded by the screen (fig. 1.1).

Ⓣ p. 94 It is also a creed among interface designers that interactivity increases the realism and effectiveness of a graphical user interface: the

5. Theorists in the second half of the twentieth century have consistently denied that an image is a more direct presentation of the world than is written or spoken language. Their approach has generally been to textualize the image and therefore to take it into the discourse of poststructuralism—a strategy apparent in works as diverse as Derrida's *Of Grammatology* (1976) and Nelson Goodman's *Languages of Art* (1968). W. J. T. Mitchell (1994) attempts to break down the dichotomy between words and images by arguing for a hybrid, the "image-text," but his picture theory finally assimilates images to words more than the reverse. Martin Jay (1993) has shown how almost all the influential French theoreticians of the twentieth century have sought to surround and subdue the image by means of text.

6. In some theorists the embarrassment becomes acute. The "punctum" in Barthes's *Camera Lucida* is precisely that element in photography that threatens to become immediate, to pull the viewer into the photograph itself. Meanwhile, in his analysis of the pernicious reality effect of cinema, Christian Metz (1977) seems appalled at the thought that the "apparatus" of the cinema can lull the viewer into a hypnotic state of apparently unmediated experience.

icons become more present to the user if she can reposition them or activate them with a click of the mouse.

Contemporary literary and cultural theorists would deny that linear-perspective painting, photography, film, television, or computer graphics could ever achieve unmediated presentation.⁵ For such theorists, the desire for immediacy through visual representation has become a somewhat embarrassing (because undertheorized) tradition.⁶ Outside the circles of theory, however, the discourse of the immediate has been and remains culturally compelling. Even within the academic community, among art historians and perceptual psychologists, linear perspective is still regarded as having some claim to being natural. (See, for example, Gombrich 1982; Hagen 1980, 1986.) Meanwhile, computer graphics experts, computer users, and the vast audiences for popular film and television continue to assume that unmediated presentation is the ultimate goal of visual representation and to believe that technological progress toward that goal is being made. When interactivity is combined with automaticity and the five-hundred-year-old perspective method, the result is one account of mediation that millions of viewers today find compelling.

It is important to note that the logic of transparent immediacy does not necessarily commit the viewer to an utterly naive or magical conviction that the representation is the same thing as what it represents. *Immediacy* is our name for a family of beliefs and practices that express themselves differently at various times among various groups, and our quick survey cannot do justice to this variety. The common feature of all these forms is the belief in some necessary contact point between the medium and what it represents. For those who believe in the immediacy of photography, from Talbot to Bazin to Barthes, the contact point is the light that is reflected from the objects on to the film. This light establishes an immediate relationship between the photograph and the object. For theorists of linear-perspective painting and perhaps for some painters, the contact point is the mathematical relationship established between the supposed objects and their projection on the canvas. However, probably at no time or place has the logic of immediacy required that the viewer be completely fooled by the painting or photograph. *Trompe l'oeil*, which does completely fool the viewer for a moment, has always been an exceptional practice. The film theorist Tom Gunning (1995) has argued that what we are calling the logic of transparent immediacy worked in a subtle way for filmgoers of the earliest films. The audience members knew at one level that the film

of a train was not really a train, and yet they marveled at the discrepancy between what they knew and what their eyes told them (114–133). On the other hand, the marveling could not have happened unless the logic of immediacy had had a hold on the viewers. There was a sense in which they believed in the reality of the image, and theorists since the Renaissance have underwritten that belief. This “naive” view of immediacy is the expression of a historical desire, and it is one necessary half of the double logic of remediation.

THE LOGIC OF HYPERMEDIACY

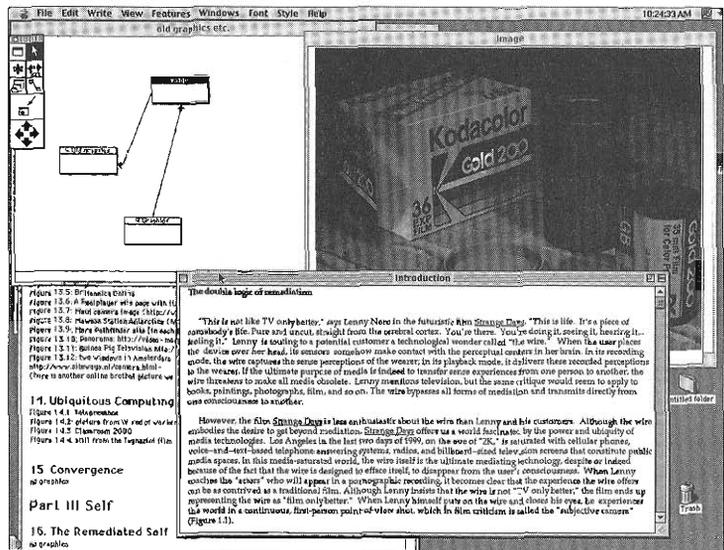
Like the desire for transparent immediacy, the fascination with media also has a history as a representational practice and a cultural logic. In digital media today, the practice of hypermediacy is most evident in the heterogeneous “windowed style” of World Wide Web pages, the desktop interface, multimedia programs, and video games. It is a visual style that, in the words of William J. Mitchell (1994), “privileges fragmentation, indeterminacy, and heterogeneity and . . . emphasizes process or performance rather than the finished art object” (8). Interactive applications are often grouped under the rubric of “hypermedia,” and hypermedia’s “combination of random access with multiple media” has been described with typical hyperbole by Bob Cotten and Richard Oliver (1993) as “an entirely new kind of media experience born from the marriage of TV and computer technologies. Its raw ingredients are images, sound, text, animation and video, which can be brought together in any combination. It is a medium that offers ‘random access’; it has no physical beginning, middle, or end” (8). This definition suggests that the logic of hypermediacy had to wait for the invention of the cathode ray tube and the transistor. However, the same logic is at work in the frenetic graphic design of cyberculture magazines like *Wired* and *Mondo 2000*, in the patchwork layout of such mainstream print publications as *USA Today*, and even in the earlier “multimediated” spaces of Dutch painting, medieval cathedrals, and illuminated manuscripts.

When in the 1960s and 1970s Douglas Englebart, Alan Kay, and their colleagues at Xerox PARC and elsewhere invented the graphical user interface and called their resizable, scrollable rectangles “windows,” they were implicitly relying on Alberti’s metaphor. Their windows opened on to a world of information made visible and almost tangible to the user, and their goal was to make the surface of these windows, the interface itself, transparent. As the windowed style has evolved in the 1980s and 1990s, however, transparency and immediacy

have had to compete with other values. In current interfaces, windows multiply on the screen: it is not unusual for sophisticated users to have ten or more overlapping or nested windows open at one time. The multiple representations inside the windows (text, graphics, video) create a heterogeneous space, as they compete for the viewer's attention. Icons, menus, and toolbars add further layers of visual and verbal meaning.

The graphical interface replaced the command-line interface, which was wholly textual. By introducing graphical objects into the representation scheme, designers believed that they were making the interfaces "transparent" and therefore more "natural." Media theorist Simon Penny (1995) points out that for interface designers: "*transparent* means that the computer interface fades into the experiential background and the analogy on which the software is based (typewriter, drawing table, paintbox, etc.) is foregrounded. If the paintbox software is 'intuitive,' it is only intuitive because the paintbox is a culturally familiar object" (55). In fact, the graphical interface referred not only to culturally familiar objects, but specifically to prior media, such as painting, typewriting, and handwriting. In making such references, computer designers were in fact creating a more complex system in which iconic and arbitrary forms of representation interact. We have only to place figure 1.2 beside the virtual environment in figure 9.1 to see that a wholly different visual logic is operating.

Figure 1.2 The windowed style of the desktop interface.



Unlike a perspective painting or three-dimensional computer graphic, this windowed interface does not attempt to unify the space around any one point of view. Instead, each text window defines its own verbal, each graphic window its own visual, point of view. Windows may change scale quickly and radically, expanding to fill the screen or shrinking to the size of an icon. And unlike the painting or computer graphic, the desktop interface does not erase itself. The multiplicity of windows and the heterogeneity of their contents mean that the user is repeatedly brought back into contact with the interface, which she learns to read just as she would read any hypertext. She oscillates between manipulating the windows and examining their contents, just as she oscillates between looking at a hypertext as a texture of links and looking through the links to the textual units as language.

With each return to the interface, the user confronts the fact that the windowed computer is simultaneously automatic and interactive. We have argued that the automatic character of photography contributes to the photograph's feeling of immediacy, but with the windowed computer, the situation is more complicated. Its interface is automatic in the sense that it consists of layers of programming that are executed with each click of the mouse. Its interface is interactive in the sense that these layers of programming always return control to the user, who then initiates another automated action. Although the programmer is not visible in the interface, the user as a subject is constantly present, clicking on buttons, choosing menu items, and dragging icons and windows. While the apparent autonomy of the machine can contribute to the transparency of the technology, the buttons and menus that provide user interaction can be seen as getting in the way of the transparency. If software designers now characterize the two-dimensional desktop interface as unnatural, they really mean that it is too obviously mediated. They prefer to *imagine* an "interfaceless" computer offering some brand of virtual reality. Nevertheless, the possibilities of the windowed style have probably not been fully explored and elaborated.

One reason that this style has not been exhausted is that it functions as a cultural counterbalance to the desire for immediacy in digital technology. As a counterbalance hypermediacy is more complicated and various. In digital technology, as often in the earlier history of Western representation, hypermediacy expresses itself as multiplicity. If the logic of immediacy leads one either to erase or to render automatic the act of representation, the logic of hypermediacy acknowledges multiple

acts of representation and makes them visible. Where immediacy suggests a unified visual space, contemporary hypermediacy offers a heterogeneous space, in which representation is conceived of not as a window on to the world, but rather as “windowed” itself—with windows that open on to other representations or other media. The logic of hypermediacy multiplies the signs of mediation and in this way tries to reproduce the rich sensorium of human experience. On the other hand, hypermediacy can operate even in a single and apparently unified medium, particularly when the illusion of realistic representation is somehow stretched or altogether ruptured. For example, perspective paintings or computer graphics are often hypermediated, particularly when they offer fantastic scenes that the viewer is not expected to accept as real or even possible. Hypermediacy can also manifest itself in the creation of multimedia spaces in the physical world, such as theme parks or video arcades. **Ⓢ p. 173** In every manifestation, hypermediacy makes us aware of the medium or media and (in sometimes subtle and sometimes obvious ways) reminds us of our desire for immediacy.

As a historical counterpart to the desire for transparent immediacy, the fascination with media or mediation can be found in such diverse forms as medieval illuminated manuscripts, Renaissance altarpieces, Dutch painting, baroque cabinets, and modernist collage and photomontage. The logic of immediacy has perhaps been dominant in Western representation, at least from the Renaissance until the coming of modernism, while hypermediacy has often had to content itself with a secondary, if nonetheless important, status. Sometimes hypermediacy has adopted a playful or subversive attitude, both acknowledging and undercutting the desire for immediacy. At other times, the two logics have coexisted, even when the prevailing readings of art history have made it hard to appreciate their coexistence. At the end of the twentieth century, we are in a position to understand hypermediacy as immediacy's opposite number, an alter ego that has never been suppressed fully or for long periods of time.

We cannot hope to explore in detail the complex genealogy of hypermediacy through centuries of Western visual representation; we can only offer a few examples that are particularly resonant with digital hypermediacy today. Some resonances seem obvious. For example, the European cathedral with its stained glass, relief statuary, and inscriptions was a collection of hypermediated spaces, both physical and representational. And within the grand space of the cathedral, altarpieces

provided a sophisticated form of hypermediacy, because they not only juxtaposed media but also embodied contradictory spatial logics. As perspectival representation came into painting, it is interesting to see, for example, a Flemish altarpiece by Arné van Kalker, now in the Musée de Cluny in Paris, with a carved representation of the Passion at the center and painted perspectival scenes on both the inside and the outside of the cabinet doors. The closed doors depict depth in the represented space; when they are opened, they reveal a bas-relief three-dimensional Passion scene that stops at the back of the cabinet. Through this interplay of the real third dimension with its perspectival representation, the Kalker altarpiece connects the older sculptural tradition with the newer tradition of perspectival representation.

Represented and real three-dimensional spaces were also combined in many secular cabinets of the sixteenth and seventeenth centuries, which could have upwards of fifty drawers, doors, and panels, each painted with a perspectival landscape or genre scene. The pictures on the doors and drawers of these cabinets ironically duplicated the three-dimensional space that they concealed. Thus, the two-dimensional pictures on the doors opened on to a fictional space, while the painted doors themselves opened on to a physical one. (For an example, see figure 1.3.) Something similar is happening in digital design today. The windowed style is beginning to play a similar game of hide and seek as two-dimensional text windows and icons conceal and then expose three-dimensional graphic images and digitized video. Even the icons and folders of the conventional desktop metaphor function in two spaces: the pictorial space of the desktop and the informational space of the computer and the Internet.

We are not alone in noting this resemblance. In *Good Looking*, art historian Barbara Stafford has remarked on the parallels between digital media and baroque cabinets—in particular when she describes the so-called *Wunderkammer*:

Turning . . . to the disjunctive jumble stored in an eighteenth-century cabinet or chamber of curiosities, the modern viewer is struck by the intensely interactive demands it places on the visitor. . . . Looking back from the perspective of the computer era, the artifacts in a Wunderkammer seem less physical phenomena and more material links permitting the beholder to retrieve complicated personal and cultural associations. Looking forward from the Enlightenment world of apparently miscellaneous pleasures, we discern that scraps of wood, stone, or metal,

Figure 1.3 An Italian cabinet, circa 1660, made of rosewood, ebony, and tortoise shell with painted glass plaques. Photography courtesy of Victoria and Albert Museum.



religious relics, ancient shards, exotic fetishes, animal remains, miniature portraits, small engravings, pages torn from a sketchbook, are the distant ancestors of today's sophisticated software [e.g., multimedia encyclopedias]. (74–75)

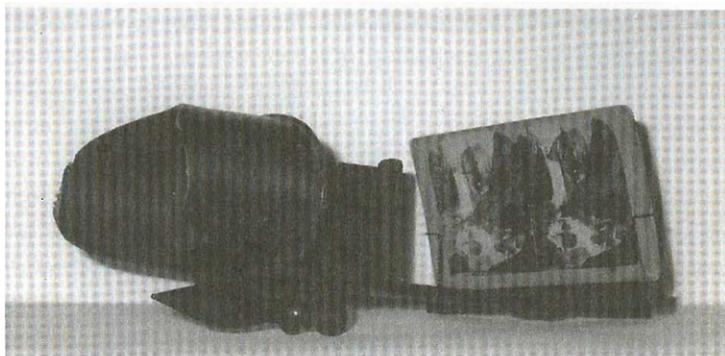
With its multiplicity of forms and its associative links, the Wunderkammer is a fine example of the hypermediacy of the baroque.

We can also identify hypermediacy in oil painting—for example, in the Dutch “art of describing” explored by Svetlana Alpers (1983). With their fascination for mirrors, windows, maps, paintings within paintings, and written and read epistles, such artists as Gabriel

Metsu, David Bailly, and especially Jan Vermeer often represented the world as made up of a multiplicity of representations. Their paintings were not multimedia; rather, they absorbed and captured multiple media and multiple forms in oil. This Dutch art has often been contrasted with the paradigm of Renaissance Italian painting with its representation of a more unified visual space, in which the signs of mediation were meticulously erased. We can in fact find hypermediacy in individual works and individual painters throughout the period in which linear perspective and erasure were ascendant: for example, in Velasquez's *Las Meninas*, discussed by Alpers, Foucault, and, because of Foucault, many others (Alpers 1982, 69–70; Foucault 1971, 3–16) One could argue—and this would simply be a version of a familiar poststructuralist argument—that hypermediacy was the counterpart to transparency in Western painting, an awareness of mediation whose repression almost guaranteed its repeated return.

Hypermediacy can be found even in the mechanical technologies of reproduction of the nineteenth century. Jonathan Crary (1990) has challenged the traditional view that photography is the continuation and perfection of the technique of linear-perspective painting. For Crary, there was a rupture early in the nineteenth century, when the stable observation captured by the old camera obscura and by perspective painting was replaced by a new goal of mobility of observation. Reflecting this goal was a new set of (now archaic) devices: the diorama, the phenakistoscope, and the stereoscope. These devices, characterized by multiple images, moving images, or sometimes moving observers, seem to have operated under both these logics at the same time, as they incorporated transparent immediacy *within* hypermediacy. The phenakistoscope employed a spinning wheel and multiple images to give the impression of movement. The appeal to immediacy here was that a moving picture, say, of a horse, is more realistic than a static image. On the other hand, it was not easy for the user to ignore or forget the contraption of the phenakistoscope itself, when even its name was so contrived. The phenakistoscope made the user aware of the desire for immediacy that it attempted to satisfy. The same was true of the stereoscope, which offered users a three-dimensional image that seemed to float in space. The image was eerie, and the device unwieldy so that the stereoscope (fig. 1.4) too seemed to be a more or less ironic comment on the desire for immediacy. Crary shows us that hypermediacy manifested itself in the nineteenth century alongside and around the transparent

Figure 1.4 A nineteenth-century stereoscope. © 1998 Richard Grusin.



7. As Clement Greenberg (1973) puts it, “Realistic, illusionist art had dissembled the medium, using art to conceal art. Modernism used art to call attention to art. The limitations that constitute the medium of painting—the flat surface, the shape of the support, the properties of pigment—were treated by the Old Masters as negative factors that could be acknowledged only implicitly or indirectly. Modernist painting has come to regard these same limitations as positive factors that are to be acknowledged openly.” (68–69).

8. Greenberg (1965, 70–74) sees collage as an expression of the tension between the modernist emphasis on the surface of the painting and the inherited tradition of three-dimensional representation. When Braque and Picasso took to pasting scraps of newspaper and wallpaper on their canvases, they created a hypermediated experience in which the viewer oscillates between seeing the pasted objects as objects and seeing them as part of the painted scene. The viewer is constantly reminded of the materials, the surface, and the mediated character of this space.

9. In making us conscious of the medium, photomontage can be seen

technology of photography. Nevertheless, the logic of transparent immediacy remained dominant. The obvious fact is that the conventional camera survived and flourished, while these other technologies did not.

According to Clement Greenberg’s influential formulation, it was not until modernism that the cultural dominance of the paradigm of transparency was effectively challenged.⁷ In modernist art, the logic of hypermediacy could express itself both as a fracturing of the space of the picture and as a hyperconscious recognition or acknowledgment of the medium. Collage and photomontage in particular provide evidence of the modernist fascination with the reality of media.⁸ Just as collage challenges the immediacy of perspective painting, photomontage challenges the immediacy of the photograph. When photomonteurs cut up and recombine conventional photographs, they discredit the notion that the photograph is drawn by the “pencil of nature,” as Talbot (1969) had suggested. Instead, the photographs themselves become elements that human intervention has selected and arranged for artistic purposes. Photographs pasted beside and on top of each other and in the context of other media, such as type, painting, or pencil drawing, create a layered effect that we also find in electronic multimedia. As we look at Richard Hamilton’s *Just What Is It That Makes Today’s Homes So Different, So Appealing?* (fig. 1.5), its cluttered space makes us aware of the process of construction. We become hyperconscious of the medium in photomontage, precisely because conventional photography is a medium with such loud historical claims to transparency.⁹

Richard Lanham (1993) notes how well Hamilton’s piece from the 1950s suits today’s “digital rhetoric” and then asks: “Couldn’t this—collaged up as it is with clip art and advertising icons—just as well be called: ‘Just What Is It That Makes Today’s Desktop So Differ-

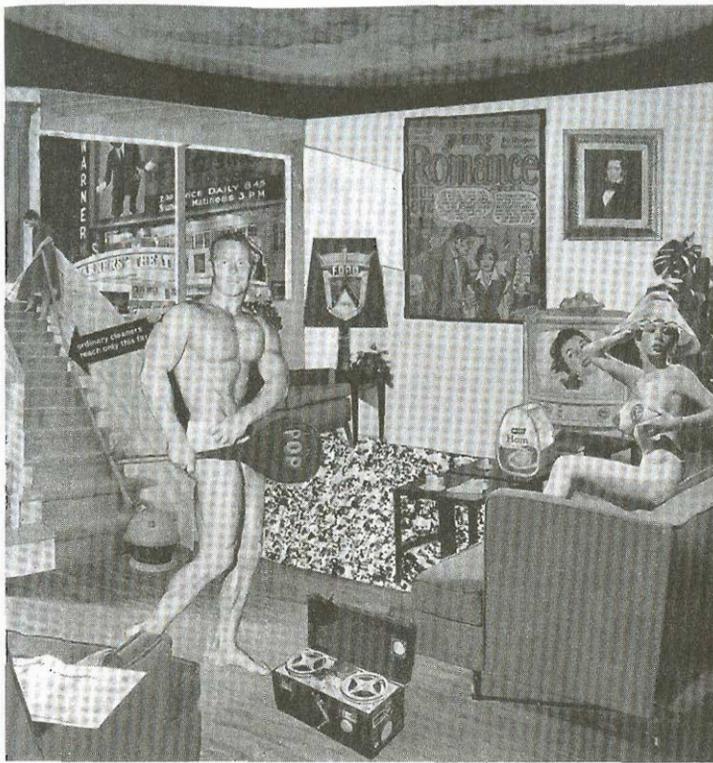


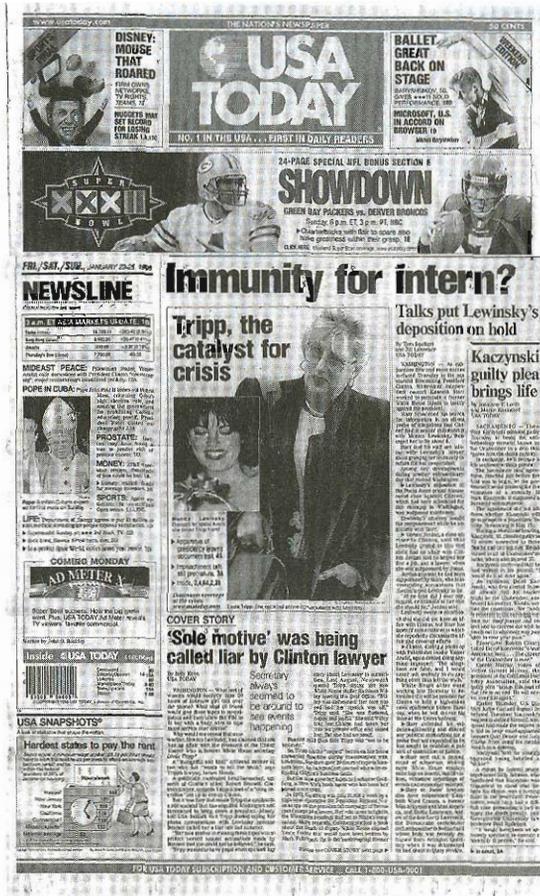
Figure 1.5 Richard Hamilton, *Just What Is It That Makes Today's Homes So Different, So Appealing?* © 1998 Artists Rights Society (ARS), New York/DACS, London.

ent, So Appealing?'" (40). In collage and photomontage as in hypermedia, to create is to rearrange existing forms. In photomontage the preexisting forms are photographs; in literary hypertext they are paragraphs of prose; and in hypermedia they may be prose, graphics, animations, videos, and sounds. In all cases, the artist is defining a space through the disposition and *interplay of forms that have been detached from their original context and then recombined*. Like Greenberg, Lanham regards collage as "the central technique of twentieth-century visual art"; Lanham wants to include digital design in the twentieth-century mainstream, which has often created heterogeneous spaces and *made viewers conscious of the act of representation* (40–41).

In the twentieth century, as indeed earlier, it is not only high art that seeks to combine heterogeneous spaces. Graphic design for print, particularly for magazines and newspapers, is becoming increasingly hypermediated as well. Magazines like *Wired* or *Mondo 2000* owe their conception of hypermediacy less to the World Wide Web than to the

both to accept and to challenge the received understanding of photography as transparent. From one point of view, photomontage can be interpreted as a deviation from the essentially transparent and unified nature of photography. On the other hand, photomontage can be seen as deviating from photography's true nature as a transparent medium but as exemplifying its irreducible hypermediacy. This latter interpretation of the photographic medium has been advanced by W. J. T. Mitchell (1994) in the idea of the "imagerext."

Figure 1.6 The front page of *USA TODAY*, January 23, 1998. © 1998 USA TODAY. Reprinted with permission.



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1: Theory

tradition of graphic design that grows out of pop art and ultimately lettrisme, photomontage, and dada. The affiliations of a newspaper like the *USA Today* are more contemporary. Although the paper has been criticized for lowering print journalism to the level of television news, visually the *USA Today* does not draw primarily on television. Its layout resembles a multimedia computer application more than it does a television broadcast; the paper attempts to emulate in print (fig. 1.6) the graphical user interface of a web site (fig. 1.7). For that matter, television news programs also show the influence of the graphical user interface when they divide the screen into two or more frames and place text and numbers over and around the framed video images. ⊕ p. 189

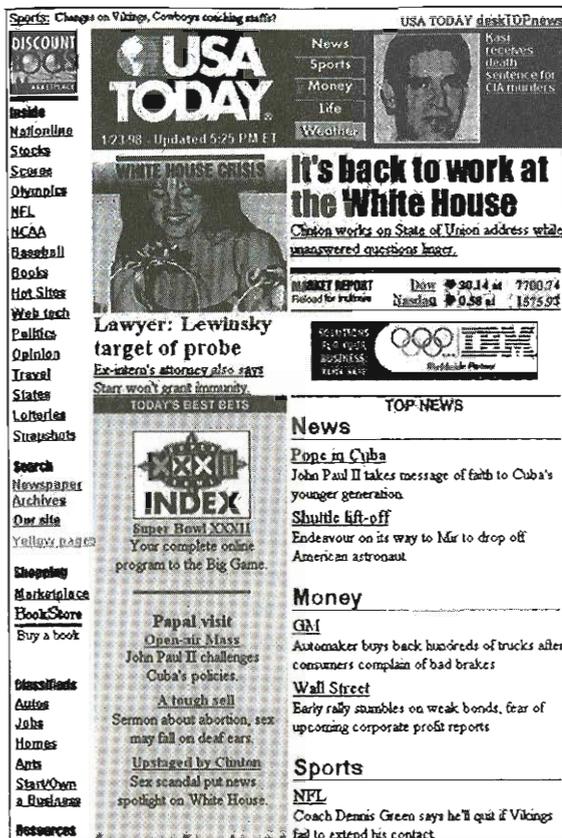


Figure 1.7 The USA TODAY web site, January 23, 1998. © 1998 USA TODAY. Reprinted with permission.

In all its various forms, the logic of hypermediacy expresses the tension between regarding a visual space as mediated and as a “real” space that lies beyond mediation. Lanham (1993) calls this the tension between looking *at* and looking *through*, and he sees it as a feature of twentieth-century art in general and now digital representation in particular (3–28, 31–52). A viewer confronting a collage, for example, oscillates between looking at the patches of paper and paint on the surface of the work and looking through to the depicted objects as if they occupied a real space beyond the surface. What characterizes modern art is an insistence that the viewer keep coming back to the surface or, in extreme cases, an attempt to hold the viewer at the surface indefinitely. In the logic of hypermediacy, the artist (or multimedia programmer or web designer) strives to make the viewer acknowledge the medium as

a medium and to delight in that acknowledgment. She does so by multiplying spaces and media and by repeatedly redefining the visual and conceptual relationships among mediated spaces—relationships that may range from simple juxtaposition to complete absorption.

For digital artist David Rokeby, the dichotomy between transparency and opacity is precisely what distinguishes the attitude of engineers from that of artists in the new technologies. Rokeby (1995) is clearly adopting a modernist aesthetic when he writes that “while engineers strive to maintain the illusion of transparency in the design and refinement of media technologies, artists explore the meaning of the interface itself, using various transformations of the media as their palette” (133). In fact, since Matisse and Picasso, or perhaps since the impressionists, artists have been “exploring the interface.” However, Rokeby may not be doing justice to “modern” engineering. Media theorist Erkki Huhtamo (1995) points out that acknowledgment is characteristic of our culture’s attitude to digital technology in general: “Technology is gradually becoming a second nature, a territory both external and internalized, and an object of desire. There is no need to make it transparent any longer, simply because it is not felt to be in contradiction to the ‘authenticity’ of the experience” (171). And Huhtamo is right to insist that hypermediacy can also provide an “authentic” experience, at least for our current culture; otherwise, we could not account for the tremendous influence of, for example, rock music.

Above, we identified the logic of transparent immediacy in computer games such as *Myst* and *Doom*, but other CD-ROMs operate according to our other logic and seem to revel in their nature as mediated artifacts. It should not be surprising that some of the clearest examples of digital hypermediacy (such as the Residents’ *Freak Show*, Peter Gabriel’s *Xplora 1*, and the Emergency Broadcast Network’s *Telecommunications Breakdown*) come directly or indirectly from the world of rock music production and presentation. Initially, when “liveness” was the signifying mark of the rock sound, early recordings adhered to the logic of transparency and aimed to sound “live.” As live performance became hypermediated, so did the recordings—as electric and then digital sampling, rave, ambient music, and other techniques became increasingly popular (cf. Auslander, forthcoming). The evolution of recording techniques also changed the nature of live performance. As early as the late 1960s and 1970s, performers such as Alice Cooper, David Bowie, and Kiss began to create elaborate, consciously artificial productions. The traditional “musical” qualities of these productions,



Figure 1.8 A screen capture from the *Telecommunications Breakdown* CD-ROM by the Emergency Broadcast Network. © 1995 TVT Records. Reprinted with permission.

never very complicated, became progressively less important than the volume and variety of sound and the visual spectacle. Today, the stage presentations of rock bands like U2 are celebrations of media and the act of mediation, while “avant-garde” artists like Laurie Anderson, the Residents, and the Emergency Broadcast Network are creating CD-ROMs that reflect and comment on such stage presentations with their seemingly endless repetition within the medium and multiplication across media. For example, in the number “Electronic Behavior Control System” by the Emergency Broadcast Network, the computer screen can be tiled into numerous small windows with shifting graphics, while a central window displays digitized clips from old films and television shows (fig. 1.8). This visual multiplicity is synchronized to an insistent “techno-rock” soundtrack. At times one or other digitized character will seem to enunciate a corresponding phrase on the soundtrack, as if all these remnants of old media had come together to perform this piece of music. In a similar spirit, the Residents’ *Freak Show* both juxtaposes media and replaces one medium with another as it combines music with graphics and animations reminiscent of comic books and other popular forms.

Except for rock music, the World Wide Web is perhaps our culture’s most influential expression of hypermediacy. As Michael Joyce (1995) reminds us, replacement is the essence of hypertext, and in a

sense the whole World Wide Web is an exercise in replacement: "Print stays itself; electronic text replaces itself" (232). When the user clicks on an underlined phrase or an iconic anchor on a web page, a link is activated that calls up another page. The new material usually appears in the original window and erases the previous text or graphic, although the action of clicking may instead create a separate frame within the same window or a new window laid over the first. The new page wins our attention through the erasure (interpenetration), tiling (juxtaposition), or overlapping (multiplication) of the previous page. And beyond the Web, replacement is the operative strategy of the whole windowed style. In using the standard computer desktop, we pull down menus, click on icons, and drag scroll bars, all of which are devices for replacing the current visual space with another.

Replacement is at its most radical when the new space is of a different medium—for example, when the user clicks on an underlined phrase on a web page and a graphic appears. Hypermedia CD-ROMs and windowed applications replace one medium with another all the time, confronting the user with the problem of multiple representation and challenging her to consider why one medium might offer a more appropriate representation than another. In doing so, they are performing what we characterize as acts of remediation.

REMEDICATION

In the early and mid-1990s, perhaps to a greater extent than at any other time since the 1930s, Hollywood produced numerous filmed versions of classic novels, including Hawthorne, Wharton, and even Henry James. There has been a particular vogue for the novels of Jane Austen (*Sense and Sensibility*, *Pride and Prejudice*, and *Emma*). Some of the adaptations are quite free, but (except for the odd *Clueless*) the Austen films, whose popularity swept the others aside, are historically accurate in costume and setting and very faithful to the original novels. Yet they do not contain any overt reference to the novels on which they are based; they certainly do not acknowledge that they are adaptations. Acknowledging the novel in the film would disrupt the continuity and the illusion of immediacy that Austen's readers expect, for they want to view the film in the same seamless way in which they read the novels. The content has been borrowed, but the medium has not been appropriated or quoted. This kind of borrowing, extremely common in popular culture today, is also very old. One example with a long pedigree are paintings illustrating stories from the Bible or other literary sources, where

apparently only the story content is borrowed. The contemporary entertainment industry calls such borrowing “repurposing”: to take a “property” from one medium and reuse it in another. With reuse comes a necessary redefinition, but there may be no conscious interplay between media. The interplay happens, if at all, only for the reader or viewer who happens to know both versions and can compare them.

On the opening page of *Understanding Media* (1964), Marshall McLuhan remarked that “the ‘content’ of any medium is always another medium. The content of writing is speech, just as the written word is the content of print, and print is the content of the telegraph” (23–24). As his problematic examples suggest, McLuhan was not thinking of simple repurposing, but perhaps of a more complex kind of borrowing in which one medium is itself incorporated or represented in another medium. Dutch painters incorporated maps, globes, inscriptions, letters, and mirrors in their works. In fact, all of our examples of hypermediacy are characterized by this kind of borrowing, as is also ancient and modern *ekphrasis*, the literary description of works of visual art, which W. J. T. Mitchell (1994) defines as “the verbal representation of visual representation” (151–152). Again, we call the representation of one medium in another *remediation*, and we will argue that remediation is a defining characteristic of the new digital media. What might seem at first to be an esoteric practice is so widespread that we can identify a spectrum of different ways in which digital media remediate their predecessors, a spectrum depending on the degree of perceived competition or rivalry between the new media and the old.

At one extreme, an older medium is highlighted and represented in digital form without apparent irony or critique. Examples include CD-ROM (or DVD) picture galleries (*digitized paintings or photographs*) and collections of literary texts. There are also numerous web sites that offer pictures or texts for users to download. In these cases, the electronic medium is not set in opposition to painting, photography, or printing; instead, the computer is offered as a new means of gaining access to these older materials, as if the content of the older media could simply be poured into the new one. Since the electronic version justifies itself by granting access to the older media, it wants to be transparent. The digital medium wants to erase itself, so that the viewer stands in the same relationship to the content as she would if she were confronting the original medium. Ideally, there should be no difference between the experience of seeing a painting in person and on the computer screen, but this is never so. The computer always inter-

venes and makes its presence felt in some way, perhaps because the viewer must click on a button or slide a bar to view a whole picture or perhaps because the digital image appears grainy or with untrue colors. Transparency, however, remains the goal.

Creators of other electronic remediations seem to want to emphasize the difference rather than erase it. In these cases, the electronic version is offered as an improvement, although the new is still justified in terms of the old and seeks to remain faithful to the older medium's character. There are various degrees of fidelity. Encyclopedias on CD-ROM, such as Microsoft's *Encarta* and Grolier's *Electronic Encyclopedia*, seek to improve on printed encyclopedias by providing not only text and graphics, but also sound and video, and they feature electronic searching and linking capabilities. Yet because they are presenting discrete, alphabetized articles on technical subjects, they are still recognizably in the tradition of the printed encyclopedia since the eighteenth-century *Encyclopédie* and *Encyclopaedia Britannica*. In the early 1990s, the Voyager Company published series of "Expanded Books" on CD-ROM, an eclectic set of books originally written for printed publication, including *Jurassic Park* and *Brave New World*. The Voyager interface remediated the printed book without doing much to challenge print's assumptions about linearity and closure. Even the name, "Expanded Books," indicated the priority of the older medium. Much of the current World Wide Web also remediates older forms without challenging them. Its point-and-click interface allows the developer to reorganize texts and images taken from books, magazines, film, or television, but the reorganization does not call into question the character of a text or the status of an image. In all these cases, the new medium does not want to efface itself entirely. Microsoft wants the buyer to understand that she has purchased not simply an encyclopedia, but an electronic, and therefore improved, encyclopedia. The borrowing might be said to be translucent rather than transparent.

The digital medium can be more aggressive in its remediation. It can try to refashion the older medium or media entirely, while still marking the presence of the older media and therefore maintaining a sense of multiplicity or hypermediacy. This is particularly clear in the rock CD-ROMs, such as the Emergency Broadcast Network's *Telecommunications Breakdown*, in which the principal refashioned media are music recorded on CD and its live performance on stage. This form of aggressive remediation throws into relief both the source and the target media. In the "Electronic Behavior Control System," old television and

movie clips are taken out of context (and therefore out of scale) and inserted absurdly into the techno-music chant (fig. 1.8). This tearing out of context makes us aware of the artificiality of both the digital version and the original clip. The work becomes a mosaic in which we are simultaneously aware of the individual pieces and their new, inappropriate setting. In this kind of remediation, the older media are presented in a space whose discontinuities, like those of collage and photomontage, are clearly visible. In CD-ROM multimedia, the discontinuities are indicated by the window frames themselves and by buttons, sliders, and other controls, that start or end the various media segments. The windowed style of the graphical user interface favors this kind of remediation. Different programs, representing different media, can appear in each window—a word processing document in one, a digital photograph in another, digitized video in a third—while clickable tools activate and control the different programs and media. The graphical user interface acknowledges and controls the discontinuities as the user moves among media.

Finally, the new medium can remediate by trying to absorb the older medium entirely, so that the discontinuities between the two are minimized. The very act of remediation, however, ensures that the older medium cannot be entirely effaced; the new medium remains dependent on the older one in acknowledged or unacknowledged ways. For example, the genre of computer games like *Myst* or *Doom* remediates cinema, and such games are sometimes called “interactive films.”

Ⓢ p. 94 The idea is that the players become characters in a cinematic narrative. They have some control over both the narrative itself and the stylistic realization of it, in the sense that they can decide where to go and what to do in an effort to dispatch villains (in *Doom*) or solve puzzles (in *Myst*). They can also decide where to look—where to direct their graphically realized points of view—so that in interactive film, the player is often both actor and director. On the World Wide Web, on the other hand, it is television rather than cinema that is remediated.

Ⓢ p. 204 Numerous web sites borrow the monitoring function of broadcast television. These sites present a stream of images from digital cameras aimed at various parts of the environment: pets in cages, fish in tanks, a soft drink machine, one’s office, a highway, and so on. Although these point-of-view sites monitor the world for the Web, they do not always acknowledge television as the medium that they are re-fashioning. In fact, television and the World Wide Web are engaged in an unacknowledged competition in which each now seeks to remediate

the other. The competition is economic as well as aesthetic; it is a struggle to determine whether broadcast television or the Internet will dominate the American and world markets.

Like television, film is also trying to absorb and repurpose digital technology. As we have mentioned, digital compositing and other special effects are now standard features of Hollywood films, particularly in the action-adventure genre. And in most cases, the goal is to make these electronic interventions transparent. The stunt or special effect should look as “natural” as possible, as if the camera were simply capturing what really happened in the light. Computer graphics processing is rapidly taking over the animated cartoon; indeed, the takeover was already complete in Disney’s *Toy Story*. ☉ p. 147 And here too the goal is to make the computer disappear: to make the settings, toys, and human characters look as much as possible like live-action film. Hollywood has incorporated computer graphics at least in part in an attempt to hold off the threat that digital media might pose for the traditional, linear film. This attempt shows that remediation operates in both directions: users of older media such as film and television can seek to appropriate and refashion digital graphics, just as digital graphics artists can refashion film and television.

Unlike our other examples of hypermediacy, this form of aggressive remediation does create an apparently seamless space. It conceals its relationship to earlier media in the name of transparency; it promises the user an unmediated experience, whose paradigm again is virtual reality. Games like *Myst* and *Doom* are desktop virtual reality applications, and, like immersive virtual reality, they aim to inspire in the player a feeling of presence. On the other hand, like these computer games, immersive virtual reality also remediates both television and film: it depends on the conventions and associations of the first-person point of view or subjective camera. ☉ p. 163 Science-fiction writer Arthur C. Clarke has claimed that “Virtual Reality won’t merely replace TV. It will eat it alive” (cited by Rheingold, 1991, back cover). As a prediction of the success of this technology, Clarke is likely to be quite wrong, at least for the foreseeable future, but he is right in the sense that virtual reality remediates television (and film) by the strategy of incorporation. This strategy does not mean that virtual reality can obliterate the earlier visual point-of-view technologies; rather, it ensures that these technologies remain at least as reference points by which the immediacy of virtual reality is measured. Paradoxically, then, remediation is as important for the logic of transparency as it is for hypermediacy.

Another category of refashioning must be mentioned here: the refashioning that occurs within a single medium—for example, when a film borrows from an earlier film, as *Strange Days* borrows from *Vertigo* or when a painting incorporates another painting, as in Courbet's *Interior of My Studio*. This kind of borrowing is perhaps the most common, because artists both know and depend most immediately on predecessors in their own medium. This borrowing is fundamental not only to film and painting, but also to literature, where the play within a play (from *Hamlet* to *Rosencrantz and Guildenstern Are Dead*) or the poem within a poem or novel (from the *Odyssey* to *Portrait of the Artist*) is a very familiar strategy. In fact, this is the one kind of refashioning that literary critics, film critics, and art historians have acknowledged and studied with enthusiasm, for it does not violate the presumed sanctity of the medium, a sanctity that was important to critics earlier in this century, although it is less so now. Refashioning within the medium is a special case of remediation, and it proceeds from the same ambiguous motives of homage and rivalry—what Harold Bloom has called the “anxiety of influence”—as do other remediations. Much of what critics have learned about this special kind of refashioning can also help us explore remediation in general. At the very least, their work reminds us that refashioning one's predecessors is key to understanding representation in earlier media. It becomes less surprising that remediation should also be the key to digital media.

Media theorist Steven Holtzman (1997) argues that repurposing has played a role in the early development of new media but will be left behind when new media find their authentic aesthetic:

In the end, no matter how interesting, enjoyable, comfortable, or well accepted they are, these approaches [repurposing] borrow from existing paradigms. They weren't conceived with digital media in mind, and as a result they don't exploit the special qualities that are unique to digital worlds. Yet it's those unique qualities that will ultimately define entirely new languages of expression. And it's those languages that will tap the potential of digital media as new [original italics] vehicles of expression. Repurposing is a transitional step that allows us to get a secure footing on unfamiliar terrain. But it isn't where we'll find the entirely new dimensions of digital worlds. We need to transcend the old to discover completely new worlds of expression. Like a road sign, repurposing is a marker indicating that profound change is around the bend. (15)

From the perspective of remediation, Holtzman misses the point. He himself appeals to a comfortable, modernist rhetoric, in

which digital media cannot be significant until they make a radical break with the past. However, like their precursors, digital media can never reach this state of transcendence, but will instead function in a constant dialectic with earlier media, precisely as each earlier medium functioned when it was introduced. Once again, what is new about digital media lies in their particular strategies for remediating television, film, photography, and painting. Repurposing as remediation is both what is "unique to digital worlds" and what denies the possibility of that uniqueness.

Mediation and Remediation

1

2

It is easy to see that hypermedia applications are always explicit acts of remediation: they import earlier media into a digital space in order to critique and refashion them. However, digital media that strive for transparency and immediacy (such as immersive virtual reality and virtual games) also remediate. Hypermedia and transparent media are opposite manifestations of the same desire: the desire to get past the limits of representation and to achieve the real. They are not striving for the real in any metaphysical sense. Instead, the real is defined in terms of the viewer's experience; it is that which would evoke an immediate (and therefore authentic) emotional response. Transparent digital applications seek to get to the real by bravely denying the fact of mediation; digital hypermedia seek the real by multiplying mediation so as to create a feeling of fullness, a satiety of experience, which can be taken as reality. Both of these moves are strategies of remediation.¹

There are two paradoxes at work here. One is that hypermedia could ever be thought of as achieving the unmediated. Consider again the music spectacle CD-ROMs like the *Emergency Broadcast Network* with its surfeit of images and sounds that bombard the viewer. The idea of excess has been part of the popular music culture for decades. At first the excess was achieved simply by turning up the volume, until the sound could be felt as well as heard. More recently, the stage productions of popular musicians have emphasized visual spectacle and the acknowledgment of multiple media. The excessive, highly self-conscious video style of MTV is one result, and the music spectacle CD-ROMs obviously remediate MTV. The excess of media becomes an authentic experience, not in the sense that it corresponds to an external reality, but rather precisely because it does not feel compelled to refer

1. The logic of remediation we describe here is similar to Derrida's (1981) account of mimesis, where mimesis is defined not ontologically or objectively in terms of the resemblance of a representation to its object but rather intersubjectively in terms of the reproduction of the feeling of imitation or resemblance in the perceiving subject. "Mimesis here is not the representation of one thing by another, the relation of resemblance or identification between two beings, the reproduction of a product of nature by a product of art. It is not the relation of two products but of two productions. And of two freedoms. . . . 'True' mimesis is between two producing subjects and not between two produced things" (9).

2. Greenberg's account of modernism has been challenged by many critics, among them T. J. Clark (1983), who criticizes Greenberg for not recognizing what Clark sees as modernism's essential qualities of negation and ideological critique. Clark's argument is refuted by Michael Fried (1983), who sees Clark as subscribing to a kind of essentialism that Greenberg too endorses. For Fried, modernism is not about "the irreducible essence of *all* painting," but rather "those conventions which, at a given moment, alone are capable of establishing [a] work's identity as painting" (227). In arguing that all mediation is remediation, we do not mean that remediation is the irreducible essence of either digital media or mediation generally, but rather that at our historical moment, remediation is the predominant convention at work in establishing the identity of new digital media.

to anything beyond itself. As with MTV, the viewer experiences such hypermedia not through an extended and unified gaze, but through directing her attention here and there in brief moments. The experience is one of the glance rather than the gaze, a distinction that Bryson (1983) has drawn in order to understand the semiotics of Western painting (cf. Bryson 1981). The aesthetic of the glance also makes the viewer aware of the process rather than just the product—both the process of creation and the process of viewing. For example, the Emergency Broadcast Network's CD-ROM conveys the feeling that we are witnessing, and in a way participating in, the process of its own construction. By emphasizing process, digital hypermedia become self-justifying. With their constant references to other media and their contents, hypermedia ultimately claim our attention as pure experience. In this claim, and perhaps only in this claim, hypermedia remind us of high modern art.

High modern visual art was also self-justifying, as it offered the viewer an experience that he was not expected to validate by referring to the external world. Modern art also promised authenticity of experience, and it emphasized the process of putting paint on canvas. As Greenberg (1986) described it, "[modern] painting and sculpture can become more completely nothing but what they do; like functional architecture and the machine, they *look* what they *do*" (34).² Digital hypermedia also look what they do. On the other hand, modern art often worked by reduction and simplification rather than excess. In that sense, digital hypermedia (and MTV) are closer in spirit to the excessive rhetoric of early modernism than to the visual practice of high modernism. The rhetoric of cyberspace is reminiscent of the manifestos of Filippo Tommaso Marinetti and the futurists. Moreover, the cyberspace enthusiasts have a similar relationship to technologies of representation that Marinetti and the futurists had to technologies of motive power (race cars, airplanes, etc.).

The second paradox is that just as hypermedia strive for immediacy, transparent digital technologies always end up being remediations, even as, indeed precisely because, they appear to deny mediation. Although transparent technologies try to improve on media by erasing them, they are still compelled to define themselves by the standards of the media they are trying to erase. The wire, Lenny claims, "is not like TV only better"; in saying this, of course, he affirms the comparison that he denies. The wire does improve on television, because it delivers "lived" experience, as television promises and yet fails to do. Similarly,

interactive computer games such as *Myst* (and its sequel *Riven*) and *Doom* define their reality through the traditions of photography and film. *Doom* is regarded as authentic because it places the user in an action-adventure movie, *Myst* and *Riven* because of the near photorealism of their graphics and their cinematic use of sound and background music. In general, digital photorealism defines reality as perfected photography, and virtual reality defines it as first-person point-of-view cinema.

It would seem, then, that *all* mediation is remediation. We are not claiming this as an a priori truth, but rather arguing that at this extended historical moment, all current media function as remediators and that remediation offers us a means of interpreting the work of earlier media as well. Our culture conceives of each medium or constellation of media as it responds to, redeploys, competes with, and reforms other media. In the first instance, we may think of something like a historical progression, of newer media remediating older ones and in particular of digital media remediating their predecessors. But ours is a genealogy of affiliations, not a linear history, and in this genealogy, older media can also remediate newer ones.³ Television can and does refashion itself to resemble the World Wide Web (p. 189), and film can and does incorporate and attempt to contain computer graphics within its own linear form. (p. 153) No medium, it seems, can now function independently and establish its own separate and purified space of cultural meaning.

To suggest that at our present moment all mediation is remediation is not, however, to suggest that all of our culture's claims of remediation are equally compelling or that we could necessarily identify all of the strategies through which digital media remediate and are remediated by their predecessors. The double logic of remediation can function explicitly or implicitly, and it can be restated in different ways:

- *Remediation as the mediation of mediation.* Each act of mediation depends on other acts of mediation. Media are continually commenting on, reproducing, and replacing each other, and this process is integral to media. Media need each other in order to function as media at all.
- *Remediation as the inseparability of mediation and reality.* Although Baudrillard's notion of simulation and simulacra might suggest otherwise, all mediations are themselves real. They are real as artifacts (but not as autonomous agents) in our mediated culture. Despite the fact that all media depend on other media in cycles of remediation, our culture still

3. It is in this sense of older media remediating newer ones that our notion of remediation can be distinguished from the Hegelian concept of sublation (*Aufhebung*), in which prior historical formations (like pagan religions) are sublated or incorporated by newer formations (like Christianity). But as Slavoj Žižek (1993) points out, the interesting move in thinking about Hegelian sublation is to look at those moments when the newer formation is still "in its becoming," when it is perceived as something of a scandal. It is in part the attempt to understand remediation at such a historical moment that we are endeavoring in this book (284–285, n. 34.)

needs to acknowledge that all media mediate the real. Just as there is no getting rid of mediation, there is no getting rid of the real.

- *Remediation as reform.* The goal of remediation is to refashion or rehabilitate other media. Furthermore, because all mediations are both real and mediations of the real, remediation can also be understood as a process of reforming reality as well.

REMEDICATION AS THE MEDIATION OF MEDIATION

Readers may already see an analogy between our analysis of media and poststructuralist literary theory of the past four decades, for Derrida and other poststructuralists have argued that all interpretation is reinterpretation. Just as for them there is nothing prior to writing, so for our visual culture there is nothing prior to mediation. Any act of mediation is dependent on another, indeed many other, acts of mediation and is therefore remediation. In his work on postmodernism, Fredric Jameson (1991) has traced out the connection between the “linguistic turn” and what he calls “mediatization.” Jameson describes the spatialization of postmodern culture as “the process whereby the traditional fine arts are *mediatized*: that is, they now come to consciousness of themselves as various media within a mediatic system in which their own internal production also constitutes a symbolic message and the taking of a position on the status of the medium in question” (162). Jameson’s mediatization of the traditional fine arts is a process of remediation, in which media (especially new media) become systematically dependent on each other and on prior media for their cultural significance. What Jameson describes as mediatization may be true not only of postmodern new media but also of prior visual media as well. What he identifies as new and truly postmodern in fact reflects an attitude toward mediation that, while dominant today, has expressed itself repeatedly in the genealogy of Western representation.

Jameson himself seems to recognize this genealogy.

It is because we have had to learn that culture today is a matter of media that we have finally begun to get it through our heads that culture was always that, and that the older forms or genres, or indeed the older spiritual exercises and meditations, thoughts and expressions, were also in their very different ways media products. The intervention of the machine, the mechanization of culture, and the mediation of culture by the Consciousness Industry are now everywhere the case, and perhaps it might be interesting to explore the possibility that they were al-

ways the case throughout human history, and within even the radical difference of older, precapitalist modes of production. (68)

Jameson still insists that there is something special about the mediatisation of our current culture: visual media are challenging the dominance of older linguistic media. The most powerful form of this “critical and disruptive challenge” is video, whose “total flow” threatens the physical and temporal differences that constitute linguistic meaning—even as the “available conceptualities for analyzing” media like video “have become almost exclusively linguistic in orientation.”⁴ Proclaimed by Jameson the dominant medium of our postmodern age, video simultaneously depends on and disrupts literary and linguistic theory. For Jameson, literary theory, and by extension the traditional humanist enterprise, is redefined by popular visual culture. In fact, television, film, and now computer graphics threaten to remediate verbal text both in print and on the computer screen—indeed, to remediate text so aggressively that it may lose much of its historical significance.⁵

In *We Have Never Been Modern* (1993), Bruno Latour takes us further in understanding the role of postmodern theory in our media-saturated, technological culture. For Latour, as for Jameson, contemporary theory gives a special status to language and interpretation: “Whether they are called ‘semiotics,’ ‘semiology’ or ‘linguistic turns,’ the object of all these philosophies is to make discourse not a transparent intermediary that would put the human subject in contact with the natural world, but a mediator independent of nature and society alike” (62). Contemporary theory thus makes it difficult to believe in language as a neutral, invisible conveyor of fully present meaning either between speaker/writer and listener/reader or between subjects and objects, people and the world. Instead, language is regarded as an active and visible mediator that fills up the space between signifying subjects and nature. But language is not the only mediator; it operates just as visual media operate in their tasks of remediation. Postmodern theory errs in trying to isolate language as a cultural force, for it fails to appreciate how language interacts with other media, other technologies, and other cultural artifacts. For Latour, the phenomena of contemporary technoscience consist of intersections or “hybrids” of the human subject, language, and the external world of things, and these hybrids are as real as their constituents—in fact, in some sense they are more real because no constituent (subject, language, object) ever appears in its

4. Jameson’s (1991) concept of “total flow” relates to the concept of the “televisual,” which Tony Fry (1993) describes as “an ontological domain” of which “almost everyone, everywhere,” lives within its reach. For Fry, and for the other authors collected in *RUA/TV*, the “televisual” signals “the end of the medium, in a context, and the arrival of television as the context” (11–13). Where Jameson still sees video as a medium, Fry aims to offer new “conceptualities” for analyzing the ontology of the televisual. (For a critique of this ontological argument, see Auslander, 1997a.)

5. In *Teletheory*, published in 1989 and therefore before the advent of the World Wide Web, Gregory Ulmer made an influential attempt to refashion academic discourse for what he characterized as the “age of video.” In this new, highly mediated environment, he argued, academic discourse must abandon its claim to critical distance and become more like television (10–11). He has subsequently revised his argument to take in new media as well.

6. Prior to *We Have Never Been Modern* (1993), Latour's fullest account of the heterogeneous network that links together humans, language, and the external world is in *Science in Action* (1987).

7. In *The Media Equation* (1996), Byron Reeves and Clifford Nass argue not only that media are real objects in the world, but that "media equal real life" (6). Drawing on their own extensive empirical research, the authors have conclusively demonstrated that people relate to media in the same way in which they relate to other people or places. For Reeves and Nass, the media equation has five variables: manners, personality, emotion, social roles, and form. Each of these variables, they argue, affects the way in which people relate to media and should inform the design choices made by media technologists and developers. This important book supports and complements our contention that media and reality are inseparable. Where Reeves and Nass focus largely on the psychological and sociological implications of how people relate to media, our concern is primarily with the cultural, historical, and formal relationships between people and media, and, more important, among media themselves.

8. For Cavell on modernist painting and acknowledgment, see *The World Viewed* (1979, 108–118). The relations among Cavell, Fried, and Greenberg are complex. See note 2 for Fried's Cavell-inspired criticism of Greenberg and T. J. Clark.

pure form, segregated from the other constituents.⁶ The events of our mediated culture are constituted by combinations of subject, media, and objects, which do not exist in their segregated forms. Thus, there is nothing prior to or outside the act of mediation.

REMIEDIATION AS THE INSEPARABILITY OF REALITY AND MEDIATION

Media function as objects within the world—within systems of linguistic, cultural, social, and economic exchange.⁷ Media are hybrids in Latour's sense and are therefore real for the cultures that create and use them. Photography is real—not just as pieces of paper that result from the photographic process, but as a network of artifacts, images, and cultural agreements about what these special images mean and do. Film is real; its reality is constituted by the combination of the celluloid, the social meaning of celebrity, the economics of the entertainment industry, as well as the techniques of editing and compositing. The reality of digital graphics and the World Wide Web is attested to by the web of economic and cultural relationships that have grown up in a few years around the products from Netscape and Microsoft.

Modern art played a key role in convincing our culture of the reality of mediation. In many cases, modern painting was no longer about the world but about itself. Paradoxically, by eliminating "the real" or "the world" as a referent, modernism emphasized the reality of both the act of painting and its product. Painters offered us their works as objects in the world, not as a representation of an external world. By diminishing or denying painting's representational function, they sought to achieve an immediacy of presentation not available to traditional painting, where immediacy had been achieved by concealing signs of mediation. Modern art was often regarded as real or authentic, precisely because it refused to be realistic, and the example of modern art reminds us of the need to distinguish mediation and remediation from representation. Although the real and the representational are separated in modern art, modern art is not therefore less immediate. Modern painting achieves immediacy not by denying its mediation but by acknowledging it. Indeed, as Cavell has noted, building on the work of Greenberg and Michael Fried, one of the defining characteristics of modernist painting is its insistence on acknowledging the conditions of its own mediation.⁸

The reality of modernist painting extends beyond the work itself to the physical space that surrounds it. As Philip Fisher (1991) has

argued, "The colonizing of this space between the surface of the canvas and the viewer has been one of the most aggressive features of the 20th century" (37). As we can learn from a visit to any traditional museum, the space between viewer and canvas is controlled, institutionalized, and policed as a special, real kind of space, which people walk around or wait before entering. The colonization of museum space has extended to the space between a photographer or videographer and the object of her mediating technology. When a tourist is taking a photograph or making a video, for example, we treat the line of sight between the camera and the object as if it were a real obstruction; we walk around it, bend under it, or wait until it is gone. We make these gestures not only out of politeness, but also to acknowledge the reality of the act of mediation that we are witnessing. In this case, the act of mediation functions in a system of pedestrian traffic circulation like a tree, a wire, or a traffic light (which is also an act of mediation whose reality we acknowledge). Mediations are real not only because the objects produced (photos, videos, films, paintings, CD-ROMS, etc.) circulate in the real world, but also because the act of mediation itself functions as a hybrid and is treated much like a physical object.

Finally, just as there is nothing prior to the act of mediation, there is also a sense in which all *mediation remediates the real*. Mediation is the remediation of reality because media themselves are real and because the experience of media is the subject of remediation.

REMEDICATION AS REFORM

The word *remediation* is used by educators as a euphemism for the task of bringing lagging students up to an expected level of performance and by environmental engineers for "restoring" a damaged ecosystem. The word derives ultimately from the Latin *remederi*—"to heal, to restore to health." We have adopted the word to express the way in which one medium is seen by our culture as reforming or improving upon another. This belief in reform is particularly strong for those who are today repurposing earlier media into digital forms. They tell us, for example, that when broadcast television becomes interactive digital television, it will motivate and liberate viewers as never before; that electronic mail is more convenient and reliable than physical mail; that hypertext brings interactivity to the novel; and that virtual reality is a more "natural" environment for computing than a conventional video screen.⁹ The assumption of reform is so strong that a new medium is now expected to justify itself by improving on a predecessor: hence the

9. In *The Soft Edge* (1997), Paul Levinson uses the term *remediation* to describe how one medium reforms another (104–114). Levinson's intriguing theory is teleological: media develop "anthropotopically"—that is, to resemble the human. For Levinson, remediation is an agent of this teleological evolution, as we invent media that improve on the limits of prior media. Thus, writing makes speech more permanent; the VCR makes TV more permanent; hypertext makes writing more interactive; and so on. The development Levinson describes, however, is always progressive. We are arguing that remediation can work in both directions: older media can also refashion newer ones. Newer media do not necessarily supersede older media because the process of reform and refashioning is mutual.

need for computer graphics to achieve full photorealism. The assumption of reform has not been limited to digital media. Photography was seen as the reform of illusionistic painting and the cinema as the reform of the theater (in the sense that early films were once called "photoplays").

It is possible to claim that a new medium makes a good thing even better, but this seldom seems to suit the rhetoric of remediation and is certainly not the case for digital media. Each new medium is justified because it fills a lack or repairs a fault in its predecessor, because it fulfills the unkept promise of an older medium. (Typically, of course, users did not realize that the older medium had failed in its promise until the new one appeared.) The supposed virtue of virtual reality, of videoconferencing and interactive television, and of the World Wide Web is that each of these technologies repairs the inadequacy of the medium or media that it now supersedes. In each case that inadequacy is represented as a lack of immediacy, and this seems to be generally true in the history of remediation. Photography was supposedly more immediate than painting, film than photography, television than film, and now virtual reality fulfills the promise of immediacy and supposedly ends the progression. The rhetoric of remediation favors immediacy and transparency, even though as the medium matures it offers new opportunities for hypermediacy.

Remediation can also imply reform in a social or political sense, and again this sense has emerged with particular clarity in the case of digital media. A number of American political figures have even suggested that the World Wide Web and the Internet can reform democracy by lending immediacy to the process of making decisions. When citizens are able to participate in the debate of issues and possibly even vote electronically, we may substitute direct, "digital" democracy for our representational system. Here too, digital media promise to overcome representation. Even beyond claims for overt political reform, many cyberenthusiasts assert that the web and computer applications are creating a digital culture that will revolutionize commerce, education, and social relationships. Thus, broadcast television is associated with the old order of hierarchical control, while interactive media move the locus of control to the individual. That digital media can reform and even save society reminds us of the promise that has been made for technologies throughout much of the twentieth century: it is a peculiarly, if not exclusively, American promise. American culture seems to believe in technology in a way that European culture, for example, may not. Throughout the twentieth century, or really since the French Revo-

lution, *salvation in Europe has been defined* in political terms: finding the appropriate (radical left or radical right) political formula. Even *traditional* Marxists, who believed in technological progress, subordinated that progress to political change. In America, however, collective (and perhaps even personal) salvation has been thought to come through technology rather than through political or even religious action.

Contemporary American culture claims to have lost much of its naive confidence in technology. Certainly postmodern theory is ambivalent about, if not hostile to, technology, but postmodern theory is European, and largely French, in its origins and allegiances. On the other hand, the whole fringe of rhetorical hangers-on that has grown up around computer technology is defined by its commitment to technological salvation. What remains strong in our culture today is the conviction that technology itself progresses through reform: that technology reforms itself. *In our terms, new technologies of representation proceed by reforming or remediating earlier ones, while earlier technologies are struggling to maintain their legitimacy by remediating newer ones.* The cyberenthusiasts argue that in remediating older media the new media are accomplishing social change. The gesture of reform is ingrained in American culture, and this is perhaps why American culture takes so easily to strategies of remediation.

Finally, remediation is reform in the sense that media reform reality itself. It is not that media merely reform the appearance of reality. Media hybrids (the affiliations of technical artifacts, rhetorical justifications, and social relationships) are as real as the objects of science. Media make reality over in the same way that all Western technologies have sought to reform reality. Thus, virtual reality reforms reality by giving us an alternative visual world and insisting on that world as the locus of presence and meaning for us. Recent proposals for “ubiquitous” or “distributed” computing would do just the opposite, but in the service of the same desire for reform. **Ⓧ p. 212** Instead of putting ourselves in the computer’s graphic world, the strategy of ubiquitous computing is to scatter computers and computational devices throughout our world—to “augment reality” with digital artifacts and so create a “distributed cyberspace.” Its advocates see such a strategy “as a way to improve on the ‘flawed’ design in ordinary reality,” in which “objects are largely ‘dead’ to distinctions we care about. Television sets and stereo systems are socially insensitive; they do not turn themselves down when we talk on the phone” (Kellogg, Carroll, and Richards 1991, 418).

Latour has argued, however, that for hundreds of years we have been constructing our technologies precisely to take our cultural distinctions seriously. Although he would probably agree with the enthusiasts for distributed computing that “the ‘distinctions’ people care about can be viewed as virtual worlds, or . . . information webs,” these enthusiasts miss the point when they want to make a categorical distinction between distributed cyberspace and other current and past technologies (Kellogg, Carroll, and Richards 1991, 418). For Latour (1992) the idea of technologies that embody our cultural values or distinctions has been a feature not only of modern but of “amodern” or “premodern” societies as well.

The advocates of ubiquitous computing express grandiloquently the implied goal of all advocates and practitioners of digital media: to reimagine and therefore to reform the world as a mediated (and remediating) space. Again this is not new. For hundreds of years, the remediation of reality has been built into our technologies of representation. Photography, film, and television have been constructed by our culture to embody our cultural distinctions and make those distinctions part of our reality; digital media follow in this tradition. Nor will ubiquitous computing be the last expression of remediation as reform—as the burgeoning promises made on behalf of “push media” already remind us.

Networks of Remediation

3

Television, film, computer graphics, digital photography, and virtual reality: our culture recognizes and uses all of these technologies as media. This cultural recognition comes not only from the way in which each of the technologies functions in itself, but also from the way in which each relates to other media. Each participates in a network of technical, social, and economic contexts; this network constitutes the medium as a technology.

WHAT IS A MEDIUM?

We offer this simple definition: a medium is that which remediates. It is that which appropriates the techniques, forms, and social significance of other media and attempts to rival or refashion them in the name of the real. A medium in our culture can never operate in isolation, because it must enter into relationships of respect and rivalry with other media. There may be or may have been cultures in which a single form of representation (perhaps painting or song) exists with little or no reference to other media. Such *isolation does not seem possible for us today*, when we cannot even recognize the representational power of a medium except with reference to other media. If someone were to invent a new device for visual representation, its inventors, users, and economic backers would inevitably try to position this device over against film, television, and the various forms of digital graphics. They would inevitably claim that it was better in some way at achieving the real or the authentic, and their claim would involve a redefinition of the real or authentic that favors the new device. Until they had done this, it would not be apparent that the device was a medium at all.

In the past fifty years, we have seen the digital computer undergo this process of "mediatization." The programmable digital computer was invented in the 1940s as a calculating engine (ENIAC, EDSAC, and so on); by the 1950s, the machine was also being used for billing and accounting in large corporations and bureaucracies. At that time, proponents began to understand the computer as a new writing technology; that was in fact the message of the artificial intelligence movement, which began as early as 1950 with A. M. Turing's famous essay, "Computing Machinery and Intelligence." The important cultural contribution of artificial intelligence was not that the computer could be a new kind of mind, but rather that it could be a symbol manipulator and could therefore remediate earlier technologies of arbitrary symbol manipulation, such as handwriting and printing.

As long as computers remained expensive and rare, available only to a limited group of experts in large institutions, their remediating functions were limited. In the 1970s, the first word processors appeared, and in the 1980s the desktop computer. The computer could then become a medium because it could enter into the social and economic fabric of business culture and remediate the typewriter almost out of existence.

Although the computational device itself, even the "user-friendly" word processor, was not a medium, that device, together with its social and cultural functions, did constitute a new medium. (Furthermore, in the 1980s and 1990s the digital computer has taken on new technical and social functions and is being constituted as a second medium, or series of media, for visual or sensory representation.)

The cultural work of defining a new medium may go on during and in a sense even before the invention of the device itself. The technologists working on the device may have some sense of where it might fit in the economy of media, what it might remediate, as fifteenth- and sixteenth-century printers did in their project to remediate the manuscript and as the inventors of photography did in the nineteenth century. Or they might be working on a device for a different purpose altogether, and they or someone else might realize its potential for constituting a new medium. In some cases the potential might emerge only slowly as the device evolved and changed (as with radio and the telephone). All sorts of cultural relationships with existing media are possible. The only thing that seems impossible is to have no relationship at all.

The cultural studies of popular media (for example, *Media Culture* by Douglas Kellner) have been right to insist on close ties between the formal and material characteristics of media, their "content," and their economic and social functions. Indeed, the various elements are so tightly bound that they can never be entirely separated; a medium is a hybrid in Latour's sense. To say, for example, that the commercial funding of American television is the cause of its insipid content (or induces individuals to identify with dominant ideologies, or whatever) is already to separate the technical form of television (as the creation and distribution of programs on television sets) from its economic expression. In fact, commercial financing is an inseparable aspect of the medium of American television, as are its many social uses (TV dinners, occupying the children, defining shopping habits). We do not mean that one could not design a different system, say public financing, but rather that, in the unlikely event that it were ever established, public financing would redefine American television as a technology or medium. This does not mean that the mode of financing *causes* American television to be what it is, but rather that the character of a technology such as television is articulated through a network of formal, material, and social practices.

Whenever we focus on one aspect of a medium (and its relationships of remediation with other media), we must remember to include its other aspects in our discourse. In the case of film, for example, when we look at what happens on the screen (in a darkened theater), we can see how film refashions the definitions of immediacy that were offered by stage drama, photography, and painting. However, when the film ends, the lights come on, and we stroll back into the lobby of, say, a suburban mall theater, we recognize that the process of remediation is not over. We are confronted with all sorts of images (posters, computer games, and videoscreens), as well as social and economic artifacts (the choice of films offered and the pricing strategy for tickets and refreshments). **p. 173** These do not simply provide context for the film itself; they take part in the constitution of the medium of film as we understand it in the United States today. We must be able to recognize the hybrid character of film without claiming that any one aspect is more important than the others. This is the claim implicit in most cultural studies analyses of popular media: that film and television embody or carry economic and cultural ideologies and that we should study media principally in order to uncover and learn to resist their ideologies

(Kellner, 1995). Although it is true that the formal qualities of the medium reflect their social and economic significance, it is equally true that the social and economic aspects reflect the formal or technical qualities.

THE MATERIAL AND ECONOMIC DIMENSIONS OF REMEDIATION

The economic aspects of remediation have already been acknowledged and explored by cultural theorists. Each new medium has to find its economic place by replacing or supplementing what is already available, and popular acceptance, and therefore economic success, can come only by convincing consumers that the new medium improves on the experience of older ones. At the same time, the economic success of workers depends on the new medium's acquired status. Thus, web designers currently command higher salaries than technical writers and graphic designers for print; it is in their interest to promote the belief that digital media can not only replace printed documents, but vastly improve on them.

Similarly, the whole entertainment industry's understanding of remediation as repurposing reveals the inseparability of the economic from the social and material. The entertainment industry defines repurposing as pouring a familiar content into another media form; a comic book series is repurposed as a live-action movie, a televised cartoon, a video game, and a set of action toys. The goal is not to replace the earlier forms, to which the company may own the rights, but rather to spread the content over as many markets as possible. Each of those forms takes part of its meaning from the other products in a process of honorific remediation and at the same time makes a tacit claim to offer an experience that the other forms cannot. Together these products constitute a hypermediated environment in which the repurposed content is available to all the senses at once, a kind of mock *Gesamtkunstwerk*. For the repurposing of blockbuster movies such as the Batman series, the goal is to have the child watching a Batman video while wearing a Batman cape, eating a fast-food meal with a Batman promotional wrapper, and playing with a Batman toy. The goal is literally to engage all of the child's senses.

We can also consider repurposing in microeconomic terms as the refashioning of materials and practices. When artists or technicians create the apparatus for a new medium, they do so with reference to previous media, borrowing and adapting materials and techniques whenever possible. Thus, Gutenberg and the first generation of printers borrowed the letterforms and layout from the manuscript and con-

structured the printed book as the “manuscript only better.” They borrowed the materials too. Paper had long been used for manuscripts, and techniques of binding remained the same (Steinberg, 1959). After winning their rather easy battle of remediation, printers in the late fifteenth and early sixteenth centuries moved away from the manuscript model by simplifying letterforms and regularizing the layout. A manuscript page was dark with the ink of letters formed by hand; these printers learned to use ink sparingly to achieve a highly legible page. In the case of photography, Talbot, one of the pioneers, justified his invention because of his dissatisfaction with a contemporary device for making accurate perspective drawings by hand, and the name “camera” was his remediation of the *camera lucida* (Trachtenberg 1980, 27; Kemp 1990, 200). Film technicians and producers remediated both photography and the practices of stage plays. We have noted that early films were once called photoplays, which expresses this combined remediation; the term *mise-en-scène* was also borrowed from stage production to refer to the film director’s control of the visual appearance. In computer graphics, paint programs borrowed techniques and names from manual painting or graphic design practices: paintbrush, airbrush, color palette, filters, and so on. World Wide Web designers have remediated graphic design as it was practiced for printed newspapers and magazines, which themselves in some cases have reappropriated the graphic design of the World Wide Web.

THE SOCIAL DIMENSION

The remediation of material practice is inseparable from the remediation of social arrangements, in the first instance because practitioners in the new medium may want to claim the status of those who worked in an earlier medium. Film stars hope to be seen as artists, as skilled as stage actors, and, at least from the 1950s on, many film directors want to be regarded as “authors” of their films. In turn, actors and directors of television dramas want their work to be accorded the status of dramatic film. On stage, in film, or on television, the mark of being a true author or actor is “moving” the audience: offering an experience that the audience finds authentic. Film and television actors and directors could also lay claim to improving on stage drama, in the sense that their newer media handle popular subjects in accessible ways and appeal to a public that twentieth-century stage drama could no longer attract. Meanwhile, computer game makers hope that their interactive products will someday achieve the status of first-run films, and there is even

an attempt to lure film stars to play in these narrative computer productions. Game makers can cite the wide appeal of their games as evidence of the success of their remediations.

The status of the photographer in the nineteenth and twentieth centuries presents a more complicated case. In their rivalry with painting, some photographers (such as Henry Peach Robinson) sought to be regarded as artists, while others (such as Lewis Hine, Edward Weston, and August Sander) promoted themselves instead as social historians or even natural scientists. Their internal disagreements were over both the material and formal basis of their medium and the social nature of the remediation that photography undertook. Meanwhile, the viewer was being refashioned into the role of photographer. Daguerre himself suggested that "everyone, with the aid of the daguerreotype, will make a view of his castle or country-house; people will form collections of all kinds, which will be the more precious because art cannot imitate their accuracy and perfection of detail. . . . The leisured class will find it a most attractive occupation, and although the result is obtained by chemical means, the little work it entails will greatly please ladies" (Trachtenberg 1980, 12–13). Daguerre had from the outset a sense of the social aspects of remediation that his invention would entail, although his "everyone" seemed to include only men and women of the leisured class. The formal remediation—that the daguerreotype captures more detail than a painting—meant that the technology would better serve the needs of the wealthy collector, an emerging, nineteenth-century type. Daguerre may not have been precisely right with his prediction. With Eastman, photography later became a pastime for a larger and less wealthy middle class.¹ The important point is that even one of its inventors realized very early that photography was about social practices as well as technical details.

1. Eastman had figured out how to automate or "blackbox" not only the mechanical but also the commercial aspects of his photographic system (Latour 1987, 115, 122, 124, 131).

The two logics of remediation have a social dimension for the viewers as well as the practitioners. We have so far used the term *immediacy* in two senses: one epistemological, the other psychological. In the epistemological sense, immediacy is transparency: the absence of mediation or representation. It is the notion that a medium could erase itself and leave the viewer in the presence of the objects represented, so that he could know the objects directly. In its psychological sense, immediacy names the viewer's feeling that the medium has disappeared and the objects are present to him, a feeling that his experience is therefore authentic. Hypermediacy also has two corresponding senses. In its epistemological sense, hypermediacy is opacity—the fact that knowl-

edge of the world comes to us through media. The viewer acknowledges that she is in the presence of a medium and learns through acts of mediation or indeed learns about mediation itself. The psychological sense of hypermediacy is the experience that she has in and of the presence of media; it is the insistence that the experience of the medium is itself an experience of the real. The appeal to authenticity of experience is what brings the logics of immediacy and hypermediacy together.

This appeal is socially constructed, for it is clear that not only individuals, but also various social groups can vary in their definitions of the authentic. What seems immediate to one group is highly mediated to another. In our culture, children may interpret cartoons and picture books under the logic of transparent immediacy, while adults will not. Even among adults, more sophisticated groups may experience a media event as hypermediated, while a less sophisticated group still opts for immediacy. In the mid-1990s a film became widely available (even in video stores) that purported to show the autopsy by American doctors of an alien creature. When both sides in the UFO debate pored over the film, their argument really concerned the logic by which the film should be read. Critics were looking for signs of mediation or staging—for example, that the telephone on the wall was of the wrong kind for the supposed date of the autopsy. Believers, on the other hand, were trying to establish that the film was a transparent recording of a “real” event. All debates about UFO films and photographs turn on the question of transparency.

The experience of hypermediacy also depends on the social construction of the media used. Staged rock productions are hypermediated events, which no one interprets as transparent in the sense that the media are to be forgotten or erased. But by entering into an immediate relationship with the media themselves—the sound, the lights, the televised images—rock fans achieve an experience they regard as authentic. Others remain distanced from that experience, either repelled or simply unmoved. This distancing depends at least in part on social grouping. For example, those on the American religious right are compelled by their construction of rock music to remain distanced. They may claim that the sinfulness of rock music lies primarily in its lyrics, but it is the nature of hypermediated experience that really troubles them. Rock music expects, if it does not require, that the viewer/listener be intimately involved in the hypermediacy—that she “abandon herself” to the music. This abandonment is all the more threatening because there is nothing offered beyond the medium—no world into

which the user can enter—as there is in conventional representational media, such as linear-perspective painting. What rock music seems to offer (and indeed what Wagnerian opera offered to the nineteenth-century German audiences, or flute music in the Lydian mode to Plato's Greeks) is pure experience, pure authenticity, real in a sense that the listener's perception cannot itself be deceived.

Photography provides an important example of the social debate that can surround the logics of immediacy and hypermediacy. When Niepce, Daguerre, Talbot, and others claimed immediacy for their new medium, they were seeking to control its social construction. A long and complicated debate followed, with important figures such as Baudelaire arguing in opposition, but in general the case for immediacy succeeded, and Western societies accepted the idea that a photograph truly captures the world. Digital photography is now challenging that claim to immediacy (p. 104), so that a new kind of hybrid is emerging whose social and practical meanings have to be reworked. Even prior to the advent of digital photography, there has been an argument for decades about whether the Western technologies of drawing and photography are governed by convention or by the intrinsic principles of human vision and Euclidean space: whether these techniques capture the world scientifically, as it appears "in the light." Although strict social constructionists and many other postmodern writers take it as dogma that linear-perspective representations are as artificial and arbitrary as any others, some psychologists and art historians still believe otherwise. An empirical test of the question has been to show perspective drawings, photographs, or films to subjects from cultures (often in Africa) that had never seen them. The results of the relatively few experiments have been mixed. When shown a photograph or perspective drawing for the first time, subjects sometimes had trouble interpreting the images, although after a few minutes or a few tries they could handle the images more easily. In other experiments subjects have had little trouble understanding films that employ editing conventions (Hagen 1980, vol. 1; Messaris 1994).

Such experiments suggest to us that neither the social nor the technical aspect of mediation should be reduced to the other. Both Western and African subjects clearly use their innate visual systems to process the information in the image, but it is also clear that the images are socially constructed. For the Westerners, photography and linear-perspective drawing are media that are constructed as transparent. The images are transparent, however, only because Westerners have already

learned to overlook, or “look through,” the conventions that they appear on paper and offer a static, monocular view. When the same images were handed to the African subjects, they were at first experienced as hypermediated. Some of the subjects had never seen paper before, so that the very idea of paper carrying an image was foreign to them (Mesaris 1994). After that initial phase, when the subjects had adjusted and could read the images “properly,” the media would still not necessarily be transparent in our sense, because the African subjects would not have had the opportunity to build the collective response that Western culture now has to perspective painting, photography, and realistic film. However, the fact that the subjects could learn so quickly to interpret the images in the Western fashion indicates that the images do take advantage of properties of the propagation of light that are the same in the developing countries as in the West. What counts as transparent or as hypermediated depends on social construction, but the social construction of immediacy is not arbitrary or oblivious to technical details. It has been relatively easy to construct linear perspective as transparent and natural, precisely because the construction can mobilize the (Western) physics of light and vision.

The social dimension of immediacy and hypermediacy is as important as their formal and technical dimensions. However, there is no need to deny the importance of the latter in order to appreciate the former, no need to reduce the technical and psychological dimensions to the social. It is not helpful to seek to reduce any aspect of media to any other. This applies equally to the economics of media, to which traditional Marxists (and capitalists) seek to reduce all other aspects. Furthermore, by seeking to recognize all aspects of media and mediation, we can best respond to, although we cannot conclusively settle, the vexing question of technological determinism.

THE WORK OF ART IN THE AGE OF REMEDIATION

Before taking up the question of technological determinism, we need to say more about remediation's political dimension. Remediation is not replication or mechanical reproduction; however, we cannot discuss its social and political dimensions without pausing to reflect on Walter Benjamin's influential essay “The Work of Art in the Age of Mechanical Reproduction” (1969). Benjamin's argument is that mechanical reproduction produces a fundamental change in the nature of art, a change that destroys the artwork's “aura” by removing it from the context of ritual and tradition in which art had been historically embedded.

Citing photography and especially cinema, Benjamin posits that technology creates a new kind of political or revolutionary potential for mass art, a potential that can also be dangerous, as his concluding discussion of Marinetti and the futurists warns us.

Benjamin's argument that technologies of mechanical reproduction are politically enabling has its counterpart today in the claim by some enthusiasts that new media, particularly the Internet, will bring about a new kind of democracy. For example, according to Howard Rheingold (1994), "The political significance of [computer-mediated communication] lies in its capacity to challenge the existing political hierarchy's monopoly on powerful communications media, and perhaps thus revitalize citizen-based democracy" (14). In the most extreme version of this argument, we find John Perry Barlow proclaiming in his "Declaration of Independence" (http://www.eff.org/pub/Publications/John.Perry.Barlow/barlow_0296.declaration April 17, 1998) that cyberspace is a new political territory in which the laws of industrial capitalism no longer apply and that a new political order lies on (or perhaps just beyond) our monitors. These Internet and new media enthusiasts are more naive, or at least less subtle, than Benjamin, for they are arguing that digital technology offers us a transparent democracy, in which the medium of political representation disappears and citizens can communicate their political will directly with each other or with their government. Benjamin believed that film educates its mass audience through a more complex dynamic.

Benjamin begins with the assertion that film technology, or mechanical reproduction in general, breaks down the aura of the work of art by eliding or erasing the distance between the work and its viewer. Removed from the cathedral or museum, the work of art is now closer to the viewer. At first glance, Benjamin seems to be suggesting that mechanical reproduction is responding to and even satisfying a desire for transparent immediacy—that removing the aura makes the work of art formally less mediated and psychologically more immediate. On the other hand, Benjamin's mechanical reproduction also seems to evoke a fascination with media. In the case of film, he describes the viewer as distracted by the rapid succession of scenes, as simultaneously entranced and aroused by the mediation of film. For just this reason, Benjamin contrasts seeing a film with viewing a painting. Unlike a filmgoer, the viewer of a painting is absorbed into the work, as if the medium had disappeared. Perhaps for Benjamin, the immediacy offered by film is the immediacy that we have identified as growing out of the fascination with media: the acknowledged experience of mediation.

Furthermore, film for Benjamin is a medium that demonstrates the inseparability of technology and reality. He emphasizes the complicated apparatus surrounding the production of film, as a result of which there is no unity or wholeness in the surrounding scene. It requires elaborate camera work, editing, and other forms of reproduction to make film appear seamless, to make its mediation disappear. Ironically, although filmmakers work hard to conceal the signs of material and technological mediation, their final product calls attention (through the rapid succession of images) to its aesthetic, temporal, and formal mediation in a way that traditional painting does not. For Benjamin, the painter and the cameraman practice very different crafts:

The painter maintains in his work a natural distance from reality, the cameraman penetrates deeply into its web. There is a tremendous difference between the pictures they obtain. That of the painter is a total one, that of the cameraman consists of multiple fragments which are assembled under a new law. Thus, for contemporary man the representation of reality by the film is incomparably more significant than that of the painter, since it offers, precisely because of the thoroughgoing permeation of reality with mechanical equipment, an aspect of reality which is free of all equipment. And that is what one is entitled to ask from a work of art. (233–234)

Benjamin encourages us to reformulate his question: What are we entitled to ask from a work of art in an “age of remediation”? Benjamin still seems to believe both that it is possible to get past mediation to “an aspect of reality which is free of all equipment” and that political revolution may come about through such an achievement. In a period such as ours today, in which media and the process of mediation are more frankly acknowledged and appreciated, the aesthetic goal and its political consequences seem to be different. The work of art today seems to offer “an aspect of reality which cannot be freed from mediation or remediation,” at the same time that new media seek to present us precisely with “an aspect of reality which is free from all mediation.” Thus remediation does not destroy the aura of a work of art; instead it always refashions that aura in another media form.

TECHNOLOGICAL DETERMINISM

If Benjamin's essay has often been read as an expression of the technological determinism implicit in classical Marxist thought, more recent scholars have been concerned to avoid the charge of determinism. Even two decades ago, British Marxist Raymond Williams (1975) made an

influential argument against the notion that new technologies “are discovered, by an essentially internal process of research and development, which then sets the conditions for social change and progress” (13). He was protesting against a view that was popular in the 1960s and 1970s and remains so today. Whether they are blaming or praising technology, politicians, futurologists, and the print and electronic media fall easily into the rhetoric of technological determinism. Enthusiasts for cyberspace such as John Perry Barlow credit the Internet with creating a new culture, while conservative politicians speak as if the Internet itself had called forth a new form of pornography. Meanwhile, Williams and others have convinced almost all historians, social scientists, and humanists, with the result that technological determinism has been one feature of traditional Marxism rejected by postmodern theory and cultural studies. Whenever it is made, the charge is now considered fatal: nothing good can come of technological determinism, because the claim that technology causes social change is regarded as a justification for the excesses of technologically driven capitalism in the late twentieth century.

Williams was reacting above all to McLuhan's (1964) then influential theory of media as “extensions of man.” For Williams, McLuhan had isolated and abstracted media from their social contexts, as if media could work directly on some abstract definition of human nature. Williams (1975) objected that in McLuhan's work, “as in the whole formalist tradition, the media were never really seen as practices. All specific practice was subsumed by an arbitrarily assigned psychic function, and this had the effect of dissolving not only specific but general intentions. . . . All media operations are in effect dissociated; they are simply physical events in an abstracted sensorium, and are distinguishable only by their variable sense-ratios” (127). In *Understanding Media* (1964) McLuhan did often claim that media change us, and he continues to influence popular versions of technological determinism today. Although he was regarded as a radical in the 1960s, McLuhan has now been adopted as a patron saint of the information industry. In the 1960s, his phrase “global village” sounded like a justification of social protest and “flower power.” Today, communications giants happily borrow the phrase in their advertising. The idea that new electronic technologies of communication will determine our social organization is clearly not threatening to corporations that produce and market those technologies.

In *Understanding Media*, on the other hand, McLuhan often notices intricate correspondences involving media and cultural artifacts.

Although Williams is right that McLuhan returns repeatedly to the claim that media bring about cultural change, the chapters of *Understanding Media* are filled with contemporary as well as historical examples, from popular and literary culture. Some of McLuhan's correspondences are still worth considering, for they point to the ways in which one medium remediates others (especially print, radio, film, and television). Often the remediations involve the social practices that accompany media—for example, how a contemporary American family views television or film. We can let go of the premise of cause and effect and still examine the interrelationships among media for which McLuhan argues. We need not be afraid of McLuhan's "formalism," as long as we remember that technical forms are only one aspect of technologies that are simultaneously social and economic. McLuhan's notion that media are extensions of the human sensorium can even be regarded as an anticipation of Donna Haraway's cyborg. McLuhan did bring to our attention the fact that media take their meaning through interactions with the senses and the body, although feminist writers since the 1970s have elaborated this idea in ways that McLuhan did not envision. In short, we can reject McLuhan's determinism and still appreciate his analysis of the remediating power of various media.

We need to keep in mind, however, the other half of Williams's critique. Williams (1975) also warned against the notion of "determined technology [which] has a similar one-sided, one-way version of human process. Determination is a real social process but never . . . [functions] as a wholly controlling, wholly predicting set of causes" (130). He argued that social forces "set limits and exert pressures, but neither wholly control nor wholly predict the outcome" (130).

In an effort to avoid both technological determinism and determined technology, we propose to treat social forces and technical forms as two aspects of the same phenomenon: to explore *digital technologies* themselves as hybrids of technical, material, social, and economic facets. Thus, virtual reality is not only a head-mounted display and computer hardware and software; it is also the sum of the entertainment and training uses to which this hardware and software is put, and it is *the institutional and entrepreneurial capital devoted to these uses*. Finally, virtual reality enacts a subjective, point-of-view aesthetic that our culture has come to associate with new media in general. These facets of the cultural meaning of virtual reality are so closely associated that it is unproductive to try to tease them apart. Like a quark, no one facet can exist in isolation; any argument forceful enough to detach one facet from its network of affiliations would necessarily bind that facet into

some other cultural network. Because our digital technologies of representation are simultaneously material artifacts and social constructions, there is no need to insist on any aspect as cause or effect.

It is difficult, however, to hold in relief all the aspects of a technology at any one rhetorical moment. Readers of this book will find sentences in which a technology is used as the subject of an action verb. We have tried to avoid the most egregious generalizations of the kind that make McLuhan so appalling to Raymond Williams and his followers. When we do write something like “digital media are challenging the status of television and film,” we are asking readers to treat this as shorthand. A longer, and less felicitous, version would be that “the individuals, groups, and institutions that create and use digital media treat these media as improved forms of television and film.” Media *do* have agency, but that agency is constrained and hybrid. To say that digital media “challenge” earlier media is the rhetoric of technological determinism only if technology is considered in isolation. In all cases we mean to say that the agency for cultural change is located in the interaction of formal, material, and economic logics that slip into and out of the grasp of individuals and social groups.

Nevertheless, our rhetoric and our strategy foreground new media in a way that may prove unacceptable to many postmodern theorists, because of their suspicion, inherited in large part perhaps from the influential Frankfurt School, that high technology has become a principal obstacle to social progress and economic justice. We cannot hope to allay this suspicion; in fact, if our argument is successful, we will exacerbate it. We believe that the cultural significance of the new digital media cannot be condemned or praised in isolation, precisely because these media are hybrids that draw on so many aspects of our culture. To condemn new media is to condemn contemporary culture itself—in a kind of jeremiad that has made a few humanists wealthy but has not helped to explain our current cultural moment. We are attempting to explore, not to pass judgment on, the twin logics of remediation at work on the eve of the twenty-first century.

THE REMEDIATION OF THE GENDERED GAZE

One more key theoretical issue remains to be touched on: the implications of gender for our understanding of remediation. Among the best-known illustrations of the Renaissance theory of linear perspective is the Dürer woodcut in which the male draftsman objectifies and mathematically dissects his female model (cf. Alpers 1982, 184–185, 187;



Figure 3.1. A draftsman drawing a nude from Albrecht Dürer, *Unterweisung der Messung*, Nuremberg, 1538.

Haraway 1997, 182–183). (See fig. 3.1.) In this image, the artist's desire for immediacy is evident in his clinical gaze, which seems to want to analyze and control, if not possess, its female object. The woodcut suggests the possibility that technologies of transparent immediacy based on linear perspective, such as perspective painting, photography, and film, or computer graphics and virtual reality, may all be enacting the so-called male gaze, excluding women from full participation as subjects and maintaining them as objects.

Beginning with Alberti's window, transparent immediacy itself may be a gendered notion. Martin Jay (1988) has suggested that Albertian technical perspective joined with Descartes's philosophical dualism to constitute "Cartesian perspectivalism"—a way of seeing that characterized Western culture at least until the coming of modernism in the twentieth century (p. 21). Evelyn Fox Keller and Christine Grontkowski (1996) have associated Descartes's dualism with the privileging of the visual and also with Western, masculinist science (187–202). They also point out that "there is a movement among a number of feminists to sharpen what, until now, had only been a vague sentiment . . . : that the logic of the visual is a male logic. According to one critic [Luce Irigaray], what is absent from the logic . . . is women's desire" (187). For these feminists, then, the desire for visual immediacy is a male desire that takes on an overt sexual meaning when the object of representation, and therefore desire, is a woman, as in the Dürer woodcut.

Film is the medium for which feminist theorists have delivered perhaps the most powerful and sustained critique of the male gaze. In

the 1970s, in a now-classic essay, Laura Mulvey argued that Hollywood film almost inevitably enacts that way of looking, because both the camera work and the narrative structure cause the viewers to identify with the usually male main character and to join him in his visual examination of women:

The actual image of woman as (passive) raw material for the (active) gaze of man takes the argument a step further into the content and structure of representation, adding a further layer of ideological significance demanded by the patriarchal order in its favorite cinematic form—illusionistic narrative film. . . . Although none of these interacting layers is intrinsic to film, it is only in the film form that they can reach a perfect and beautiful contradiction, thanks to the possibility in the cinema of shifting the emphasis of the look. The place of the look defines cinema, the possibility of varying it and exposing it. This is what makes cinema quite different in its voyeuristic potential from, say, striptease, theatre, shows, and so on. Going far beyond highlighting a woman's to-be-looked-at-ness, cinema builds the way she is to be looked at into the spectacle itself. . . . Cinematic codes create a gaze, a world and an object, thereby producing an illusion cut to the measure of desire. (1989, 25)

The desire of which Mulvey speaks certainly seems to be what we call the desire for immediacy, which then becomes a male desire to possess, or perhaps to destroy, the female. The case is clearest in detective films, such as Hitchcock's *Vertigo* (1958), in which the detective follows, observes, and not coincidentally falls in love with the woman he is asked to investigate. Through Hitchcock's transparent style, we share the detective's gaze and perhaps his desire for both cognitive and sexual immediacy, which is the real subject of the film. © p. 150 Mulvey suggests that film is the definitive medium for representing this desire, because only film can offer a mobile and shifting point of view. She exaggerates somewhat. Striptease (and perhaps the theater in general) would also seem to build the way woman is to be looked at into the spectacle itself. What else is striptease, in fact, but a highly stylized structure for gazing at women? Nevertheless, film's claim to immediacy is that it defines and controls the structure of the gaze with greater precision. Mulvey is in fact arguing that film remediates striptease and the theater (we would add photography and painting) through its ability to change point of view, and, because of this remediation, it offers a new path to satisfying a familiar desire.

It may well be that film and other technologies of transparent immediacy enact a gendered form of looking. On the other hand, visual media can pursue other routes to immediacy than perfect transparency. Television's claim to immediacy depends not only on its transparency (conventional television is not as visually precise as film), but also on its ability to present events "live." ⊕ p. 187. The immediacy of such new media as computer games and the World Wide Web is supposed to come through interactivity—the fact that these media can change their point of view in response to the viewer or user. Indeed, interactivity even forms part of virtual reality's claim to immediacy. Finally, there is the immediacy that comes through hypermediacy—an immediacy that grows out of the frank acknowledgment of the medium and is not based on the perfect visual re-creation of the world. In such cases, we do not look *through* the medium in linear perspective; rather, we look *at* the medium or at a multiplicity of media that may appear in windows on a computer screen or in the fragmented elements of a collage or a photomontage. We do not gaze; rather, we glance here and there at the various manifestations of the media. This immediacy is not based on a desire to control and appropriate the female form, or any form, and may not be univocally gendered.²

Even within the cinema, there can be a hypermediacy of which Mulvey does not take adequate account. Recent film theorists such as Linda Williams (1995, 1–22) have criticized Mulvey's influential view for not attending to the multiplicity of possible viewers and viewing positions. Early film defined an alternative viewing position, which Tom Gunning (1995) has called the "cinema of attractions," and to which recent Hollywood film is returning with the help of computer graphics. ⊕ p. 155 Other theorists argue that we need to understand the filmic gaze in the context of other media or mediated experiences—for example, in the early days of film, the pleasures of strolling along boulevards and through arcades, of looking into shops, and of visiting museums and other exhibits (Friedberg 1995, 59–83; Schwartz 1995, 87–113). Vanessa Schwartz goes on to compare our contemporary cinema to the mediated spaces of shopping malls. ⊕ p. 174 Paul Young (1998) has argued that some early films were concerned with the potential rivalry of the telegraph, wireless, and radio. In other words, from its beginnings the cinema has entered into remediating relationships with a variety of other forms, and these relationships may encourage ways of looking other than the appropriating male gaze.

2. For psychoanalysis, immediacy may not be gendered in any univocal way. In Freudian terms, the desire for immediacy may well be a kind of prephallic desire to unite with the mother or return to the womb. This desire can be shared by women. Even in Lacanian terms, the desire for wholeness—the desire to get back behind the psychic split defined by the mirror stage—is something that both men and women can feel, although in different ways.

The model offered by Christian Metz and Laura Mulvey treats the cinema as a medium in isolation. In fact, they understand the viewer's experience of film as one of enforced isolation: he sits in a darkened theater and falls under the imaginary spell of the cinematic apparatus. However, in our media-saturated culture, we see film through other media and other media through film in a play of mutual remediations. The experience of transparent immediacy remains important in contemporary Hollywood film, but it is not the sole experience that even Hollywood film offers. Even for a male viewer, a recurring fascination with the medium distances and frames the viewing experience; the viewer oscillates between a desire for immediacy and a fascination with the medium. This distancing and framing occur not only for the spectator in the darkened theater, but also during all the other manifestations that precede and follow that supposedly isolated experience: the previews playing on monitors in the lobby of the theater; the home viewing of whole films on videocassette; the appearance of trailers, film stills, and information on the World Wide Web; and so on. These agents of remediation are at work for older films as well as contemporary ones. Perhaps it was still possible in 1958 to view *Vertigo* in relative isolation from other media. (In its early days, television remediated vaudeville and live theater more often than it remediated film.  p. 185) But now even old films are caught in the logic of hypermediacy. In the mid-1990s a remastered version of *Vertigo* was released for the theater, and part of the remastering process included digital enhancing. The movie is available on videocassette and on laser disk, and a search of the Web reveals well over two-thousand web documents that mention Hitchcock's *Vertigo*, some of which include film stills.

As a result of such remediations, we may all experience film and other visual media with something of that multiple consciousness or "double desire" that Teresa de Lauretis (1984, 155) ascribes to the female spectator, who is necessarily shut out from any simple participation in the transparent male gaze (cf. Doane 1991, 17–32). The remediation of the male gaze is apparent in *Strange Days*, when Lenny experiences a wire recording of a brutal rape and murder simultaneously from the points of view of the male assailant and his female victim.  p. 163. The violent potential of the male gaze is not denied, but it is certainly complicated by the remediating power of the wire. The male gaze can be distanced and framed by new media as well—for example, in the Amsterdam webcam, which purports to monitor the windows of rooms occupied by prostitutes (fig. 12.12). Although such a webcam

seems perfectly to enact the male gaze, no one could find this site even mildly erotic. The viewer may certainly be curious about what is going on behind the shades, but his desire for immediacy must pass quickly into a fascination with the medium. © p. 208

Furthermore, it is not clear whether the desire for immediacy must necessarily be expressed in the scopophilia of the male gaze. For if the male gaze takes as its sole purpose to control and possess the female, then the desire for immediacy implies another kind of looking as well. In formal terms, the desire for immediacy is the desire to get beyond the medium to the objects of representation themselves. Different media may enact this desire in different ways. Although linear-perspective painting and film may keep the viewer distant from what he views, in virtual reality the viewer steps through Alberti's window and is placed among the objects of representation. Similarly, the desire for sexual immediacy could aim for a voyeuristic examination of the objects of representation or a union with them. If the aim is voyeuristic, then the spectator is practicing the traditional male gaze. However, if the aim is union, then the desire for immediacy could be interpreted in Lacanian terms as the longing gaze of the mirror stage—a desire to return to an original state of union (with the mother) prior to the split that defined the subject and simultaneously privileged the male realm of the Symbolic over the realm of the Imaginary. The desire for immediacy then becomes the desire to return to the realm of the Imaginary and could well be shared by female spectators.

Finally, if the male gaze is exclusively an exercise in control and possession, the question remains whether such a gaze can be sustained in contemporary visual media, which are constantly remediating one another and therefore reminding us of the futility of believing that any technology of representation can fully erase itself. We may wonder whether the male gaze was ever represented unproblematically even in apparently transparent media. If we look back at the Dürer woodcut, we see that it too is hypermediated, at least to the extent that it does not simply enact the male gaze but represents it. After all, we do not look through the draftsman's eyes in a first-person, point-of-view shot; instead, we see the draftsman in the act of gazing. Since this image is not a motion picture, we cannot have the establishing-shot, point-of-view-shot, reaction-shot sequence that would enact the male gaze more straightforwardly. Instead, we are made conscious of our position as spectators, for our perspective enables us to appreciate the dissecting character of the draftsman's gaze. The subject of this woodcut is the

technique of linear perspective itself, which is what makes the image so amenable to a feminist critique. Once again, the desire for immediacy passes into a fascination with media. In this case, the conventional, heterosexual male gaze leaves itself open to another, hypermediated kind of looking.

All this suggests a psychosexual interpretation of the dichotomy between transparent immediacy and hypermediacy. Transparent immediacy attempts to achieve through linear perspective a single, "right" representation of things. Linear perspective becomes the normal and normative way of looking at the world, while hypermediacy becomes the sum of all the unconventional, unusual, and in some sense deviant ways of looking. Hypermediacy is multiple and deviant in its suggestion of multiplicity—a multiplicity of viewing positions and a multiplicity of relationships to the object in view, including sexual objects. Lorraine Gamman (1989, 12) has suggested that the female gaze can be distinguished from the male gaze by its multiplicity—so much so that it may be not be appropriate to speak of the female gaze at all, but rather of a series of looks from various perspectives.

At the same time, Judith Butler (1990) has argued that heterosexuality itself depends on homosexuality for its cultural meaning. While the socially accepted practice of heterosexuality seeks to exclude other sexual practices as deviant, it is precisely this exclusion that enables heterosexuality to define itself as normal and normative: "For heterosexuality to remain intact as a distinct social form, it *requires* an intelligible conception of homosexuality and also requires the prohibition of that conception in rendering it culturally unintelligible. Within [Butler's revised notion of] psychoanalysis, bisexuality and homosexuality are taken to be primary libidinal dispositions, and heterosexuality is the laborious construction based upon their gradual repression" (77). In the same way, we might argue that linear perspective, which enacts the heterosexual male gaze, depends on hypermediacy, which is defined as an "unnatural" way of looking at the world. As the sum of all unnatural modes of representation, hypermediacy can then be used to justify the immediacy of linear perspective. It would be for this reason that hypermediacy always reemerges in every era, no matter how rigorously technologies of transparency may try to exclude it. Transparency needs hypermediacy.