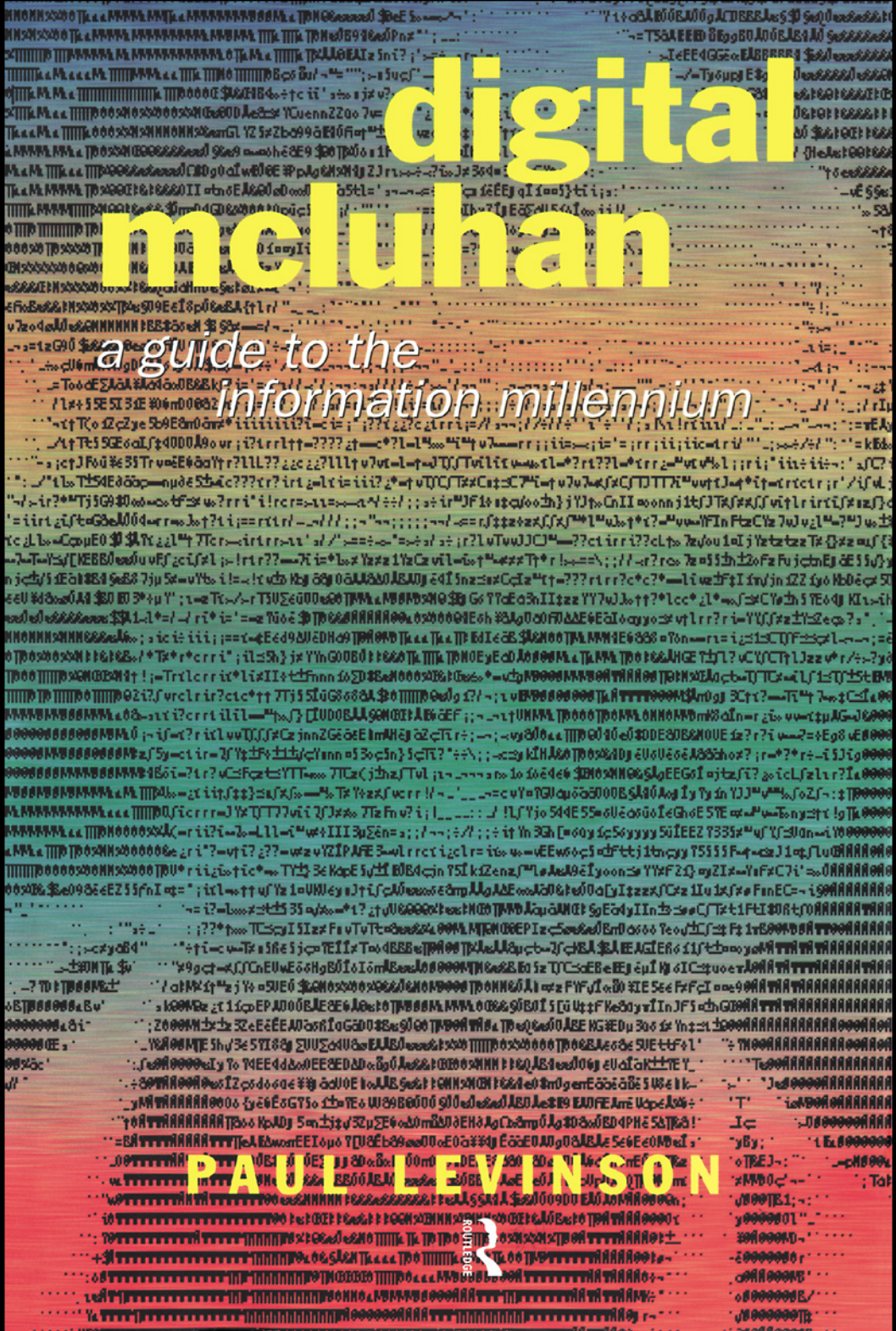

Also available as a printed book
see title verso for ISBN details

digital mcluhan

digital mcluhan

a guide to the information millennium

PAUL LEVINSON

First published 1999
by Routledge
11 New Fetter Lane, London EC4P 4EE

This edition published in the Taylor & Francis e-Library, 2004.

Simultaneously published in the USA and Canada
by Routledge
29 West 35th Street, New York, NY 10001

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

Library of Congress Cataloguing in Publication Data
Digital McLuhan: a guide to the information millennium/Paul Levinson.
Includes bibliographical references and index.
1. Mass media–information Revolution–Internet–technology.
2. McLuhan, Marshall. I. Title.
P90.L413 1999
98–40359
302.23–dc21
CIP

ISBN 0-203-16434-2 Master e-book ISBN

ISBN 0-203-25847-9 (Adobe eReader Format)
ISBN 0-415-19251-X (Print Edition)

TO JOHN M. CULKIN,

1928—1993

CONTENTS

Acknowledgements xi

1 INTRODUCTION: COINCIDING REALMS 1

The game plan 4

McLuhan & Company 18

"I don't explain–I explore"

2 THE RELUCTANT EXPLICATOR 24

Analogy and logic 26

The digital fulfillment, part I 28

The digital fulfillment, part II 30

McLuhan's medium 32

"The medium is the message"

3 NET CONTENT 35

The medium as content: writing up on the screen 36

The user as content online 39

Media within media within media...the primacy of speech and the exception of photography 41

"Acoustic space"

4 THE SONG OF THE ALPHABET IN CYBERSPACE 44

The acoustic world, heard offline 46

Script, print, cyberspace 48

The acoustic world, seen online 49

A cyberspace *sans* alphabet? 51

"Discarnate man"

5 ONLINE ANGELS 55

Virtual virtue and sex discarnate 57

God's-eye views 60

The devil in the DNA 62

"The global village"

6 FROM VOYEUR TO PARTICIPANT 65

Village of children, village of voyeurs 67

Politics in the online global village 70

Business in the online global village 75

"Centers everywhere, margins nowhere"

7 THE FATE OF THE CENTER 80

God's space 81

Online education everywhere 83

The gravity of government 86

Monopoly online? 88

The city eternal: analog as digital 92

"Light-through/light-on"

8 THE MIND BEHIND THE SCREEN 95

Science and the aesthetician 96

A kinetic understanding of media 98

The peripatetic couch potato 101

The screens and the skies 102

"Hot and cool"

9 WAY COOL TEXT 105

Bare essentials of the media thermometer 107

Cultural consequences 110

Text interactive 113

"Everyone a publisher"

10 THE RUSTED GATEKEEPER 119

Janus ascendant 121

Gatekeeping mentality 125

Filtration versus evaluation 127

From gatekeeper to matchmaker 129

"Surf-boarding electronic waves"

11 SERFS TO SURF 132

Inside-out on the phone 133

The home office: friend of the family 135

The home office as friend: counter-indications 138

Toy, mirror, and art 140

"The machine turned Nature into an art form"

12 BEAUTY MACHINES 145

Of delicatessen and convertibles 147

Television as art in the digital age 149

First loves and nostalgia versus art 152

The Internet as mainstream 154

"We have no art, we do everythingwell"

13 BALINESE AT WORK ONLINE 158

Mythic proportions and Herculean tasks: vertical vs. horizontal 160

Theremin as therapy for art 164

Virtual virtuosity 169

"Rear-view mirror"

14 THROUGH A GLASS, BRIGHTLY 173

The Web of rear-view mirrors 175

Rear-view mirror in the toolbox 178

Prescriptions for the future 182

"Laws of media"

15 SPIRALS OF MEDIA EVOLUTION 187

Basics of the tetrad 189

Spirit of the digital age 191

Deep retrieval and the digital arts 194

Reversal of the digital age 197

Reversal of media determinism 200

Bibliography 204

Index 212

ACKNOWLEDGEMENTS

I first met Marshall McLuhan's work in 1964, as an undergraduate at the City College of New York. I would like to thank the professor who introduced me to *Understanding Media* (McLuhan, 1964) by name, but the truth is I cannot remember it—I was 17 at the time—and most of the good sense he showed in assigning that book to our class (I believe it was a seminar in educational psychology) was lost on me.

A decade would elapse before I encountered McLuhan's work in an academic setting again, but this time it was with all of the trimmings—not just a book, but McLuhan's work as a course of study—and I was a far more appreciative audience. That presentation of McLuhan's ideas was by John Culkin, who had arranged for McLuhan to spend a year at Fordham University in the late 1960s, and who by the 1970s had created an independent Center for Understanding Media, along with a Master of Arts in Media Studies offered first by Antioch College and then by the New School for Social Research, where I enrolled in 1974. John was a man whose personal warmth and zest for the knowledge he sought to convey was every bit as extraordinary as his comprehensive understanding of McLuhan, and my life as a scholar and media theorist would have been different indeed had I not had the good fortune to receive this kind of

introduction to McLuhan from John. His death in 1993 prevents me from thanking him personally now, but this book, I hope, is testament to the send-off he gave to me.

By 1976, I had completed the MA in Media Studies at the New School, and had embarked on a Ph.D. in "Media Ecology," several blocks down the street in Greenwich Village at New York University. The guiding light of that doctoral program was and still is Neil Postman, who not only taught me how to teach, but conveyed valuable insights about McLuhan's work and its impact on the world. And Postman introduced me to more than McLuhan's work—he introduced me to Marshall McLuhan himself, a signal event in itself responsible for this book, and about which I will say more below. Neil Postman is of course an influential media theorist in his own right, and although I have had occasion to find fault with what I view as his unnecessarily pessimistic critique of media, his books are also cited in this book as noteworthy applications of McLuhan's thinking. Christine Nystrom and Terence Moran are other faculty in the "Media Ecology" Ph.D. program who helped teach me about McLuhan.

The people who were students with me in that doctoral program were as much a trove of enlightening conversation about McLuhan as were the faculty. Josh Meyrowitz and Ed Wachtel made the most prominent contributions. Their subsequent publications, like Postman's, are cited in this book.

By the time I was awarded the Ph.D. in 1979, two things had occurred in my life which had profound influence on my understanding of McLuhan, and perforce my writing of this book: McLuhan and I had become personal friends, and I was an Assistant Professor of Communications at Fairleigh Dickinson University.

The circumstances of my meeting with McLuhan, our brief but rich intellectual relationship in the few years before his death, are discussed at appropriate places in this book. Rather than previewing them here, I will simply state not only the obvious that McLuhan in his work is the person to whom I owe the biggest debt of gratitude for this book, but McLuhan in person was the most stimulating conversationist I have ever known. The dozen or so times we met—the chats we had over lunch, dinner, on the street, not to mention the numerous talks on the phone—were veritable alternate textbooks to McLuhan's published work, covering the same territory but often from a slightly different angle or altitude that revealed a camouflaged path to understanding.

As for my teaching, I must admit that, although I greatly prize this profession that is dedicated to the imparting of knowledge to others, I have always found a selfish motive for teaching as well: I truly learn something new, sometimes many things, in every class that I teach. My "Theories of Mass Communication" course at Fairleigh Dickinson University in the late 1970s and early 1980s was of course well stocked with McLuhan—his thinking dominated the class—and the very teaching of these ideas helped me clarify them. Likewise, the "Media Environments" course I taught in the early 1980s summer sessions at Fordham University's Graduate School were instructive about McLuhan—I hope to my students, but certainly to me.

My first course devoted entirely and explicitly to McLuhan was a "Seminar on McLuhan: 25 Years Later," that I created and began offering for the New School's MA in Media Studies (both online and in-person programs) in 1989. The "25 years" referred to the time that had passed since McLuhan's publication of *Understanding Media* in 1964, and I offered this course intermittently through the early 1990s with suitably updated titles. The student response to those courses corroborated what I already knew: that McLuhan's work was, if anything, increasing in relevance, almost as if our information age was crystallizing along the patterns of his vision. Undergraduate courses at Hofstra University and Fordham University in the middle and late 1990s gave me the same lesson.

I thus thank my students in every course I taught in which McLuhan's work played a role. Their questions and comments are among the unacknowledged catalysts of this book, so I recognize them here.

The two dozen essays, reviews, and books I have published since 1976 that deal in whole or in part with McLuhan's work have also been helpful in clarifying and developing my thinking about McLuhan, and I thank each and every editor who made those publications possible. Those texts are discussed in Chapter 1 and throughout this book, and are listed in the Bibliography.

I also thank Adrian Driscoll, editor of both my previous book, *The Soft Edge,* and this book. His encouragement was crucial.

Members of Marshall's family have been wonderful in the support they have given me, personal as well as intellectual, in my McLuhan studies over the years. Corinne, Marshall's wife, could not have made Tina (my wife) and me feel more welcome in their home during our trips to Toronto to see Marshall in the late 1970s. A dinner with Corinne, or even a chat, to this day easily

remains the high point of any trip to Toronto, or indeed anyplace where I may be fortunate enough to meet her. Eric, one of Marshall's sons, was a big help to his father in his work on the "laws of media" near the end of his life. Eric's friendship, and his continuing application of his father's insights to the media of our day, has been a great help to me. Teri, one of Marshall's daughters, lives in NewYork City, which means we get a chance to meet a bit more often. In addition to her evocative work in anthropology, Teri is the keenest thinker I know about the place of her father in the intellectual firmament. Her counsel over the years has been invaluable.

I owe even more gratitude for this book to my own family. Tina Vozick and I were married a little over a year when we first went up to see Marshall in Toronto in the summer of 1977. One evening—after a day with Marshall at his University of Toronto office, and a superb dinner with Marshall and Corinne at their home—Corinne drove us to a nearby bus stop. But Tina and I were so excited by the day and its sparkling conversation that we could not stand still. So we walked, hand-in-hand for more than an hour, through the streets of Toronto to our hotel. Those streets truly seemed paved with magic that night, and indeed I walked them in every page that I wrote in this book.

Our children—Simon, 14, Molly, 11—have been with us on that walk since they came into our lives. Authors often speak of "first readers"—people to whom they entrust a new manuscript for perusal before anyone else—but I have been fortunate indeed to also have a family of first listeners, discussants, and thinkers. Our conversations, increasingly enriched by insights and anecdotes and points of view provided by our children, wend their way through dinners, car rides, and vacations, and consequently through this book. In a sense, this book is more for their generation than ours, for they are, already, more fully denizens of the information millennium.

Paul Levinson
September, 1998

1

INTRODUCTION

Coinciding realms

Digital McLuhan is actually two intertwining books: one presents McLuhan's ideas about media and their impact upon our lives, the other presents my ideas about how McLuhan's ideas can help us make sense of our new digital age. I likely would have written a book like this in any case. But McLuhan could not, because he died on the last day of 1980, almost literally on the doorstep of the personal computer revolution that would change so much of our world, yet be so explicable via insights and comparisons McLuhan had earlier made.

Those insights showed us a world of media in motion, in which television was triumphing over books, newspapers, radio, and motion pictures for crucial segments of our attention, and consequently was exerting profound influence on politics, business, entertainment, education, and the general conduct of our lives. This Bayeux Tapestry of media in competition for our patronage—for our souls, according to some—quite naturally led McLuhan to consider the ways that media differed in their engagement of our mentalities. How and why, for example, does seeing a movie on television differ from seeing it in a motion picture theater, how is reading the news different from hearing it on radio, and how is that in turn different from watching it on TV? In raising and attempting to answer such questions, McLuhan in the 1950s, 60s, and 70s developed an intricate taxonomy of media and their effects, one which reached

back to the origin of our species for comparisons—as in its recognition of similarities between pre-literate and electronic communication—and left openings aplenty for media to come. How is selecting the news we want to read, hear about, and watch on the Internet different from its presentation via newspapers, radio, and television?

The handwriting for coming to terms with our digital age was on the wall of McLuhan's books.

But that writing could be useful only to the extent that it was comprehensible—navigational clues, outlines of environments, in a language we do not clearly understand can serve to frustrate as much as educate. To the degree that McLuhan's taxonomy of media was cast in such a language, it was also a wall in the unintended sense of being an obstacle to understanding. McLuhan sought to call attention to the pre-eminent and overlooked role of the medium in communication—the difference between reading news in a newspaper and watching it on TV—with his famous aphorism, "the medium is the message." His critics and casual readers mistook that for a claim that the content—what it is we read in newspapers or watch on TV—is totally unimportant. He used provocative analogies to dramatize the differences between television and its competitors—cool versus hot, light-through versus light-on, acoustic versus visual space. But such metaphors often performed in ways precisely contrary to the reason that metaphors are employed: rather than elucidating a lesserknown area by relating it to an area that we know well, hot and cool and light-through and light-on were far more arcane than the media effects they sought to illuminate. When McLuhan was called upon to explain, he said his intention was not to explain, but to explore.

But this difficulty with McLuhan's presentation—with his medium of expression—in no way diminishes the importance of its content. It was there to see all along for those willing to learn the language, to see what was right with his game, as Wittgenstein advised we do about any novel ideas we may come across, in addition to subjecting them to criticism. Tom Wolfe asked in 1965, "What if he is right?" Might McLuhan be "the most important thinker since Newton, Darwin, Freud, Einstein, and Pavlov?" Although Wolfe surprisingly included Pavlov on that list, he was asking the right question. And the perspective of *Digital McLuhan* is that the answer is yes, at least insofar as a framework for understanding the human relationship with technology and therein the world and the cosmos is as important as

frameworks for understanding the human psyche, life, and the cosmos in a physical sense.

Others came to the same conclusion. Critical anthologies such as Stearn's *McLuhan: Hot & Cool* (1967) and Rosenthal's *McLuhan: Pro and Con* (1968) contained as much admiration as denunciation of McLuhan (his language was so vivid, its claims so bold even when misunderstood, that inattention was rarely the first response). His biographers Philip Marchand (1989) and W. Terrence Gordon (1997) describe the caliber of protest at the University of Toronto's plan to close McLuhan's Centre for Culture and Technology in 1980, after he had been incapacitated by a stroke. Buckminster Fuller, John Cage, Woody Allen, Pierre Elliot Trudeau, and Jerry Brown were among the hundreds who called or wrote letters of support. The Centre was closed then nonetheless, but a recognition of McLuhan's importance was amply demonstrated at pinnacles of scholarly, cultural, and even political discourse.

In fairness to McLuhan's detractors, however, his work suffered from a problem more fundamental than the dazzle of his metaphors—a problem, moreover, not of McLuhan's making, and quite beyond anyone's capacity to redress at the time. In the scientific, and by extension social scientific, community, the surest way of determining to what extent someone's idea is right or wrong is to gauge the accuracy of its predictions. But there was no good occasion in the three decades McLuhan wrote about the media for either him or his associates to do this. From the publication of *The Mechanical Bride,* his first book about media, in 1951, to his death on the eve of 1981, television utterly dominated public and private life. This meant that any predictions McLuhan made about television, or were generated by others from his ideas, had elements of the ex post facto, of explanations of an environment already present. Thus, McLuhan observed that JFK's "cool" style was more appropriate to the medium of television than Nixon's "hot" arguments in 1960, and Jimmy Carter's low-key persona similarly made him appealing to voters making decisions on the basis of television sixteen years later. But as intriguing and useful as those connections may have been (and still are), they could not provide the corroboration of McLuhan's ideas that the arrival of a new medium—as revolutionary and unforeseen in its impact as television—might have bestowed, had the advent of that new medium and its effects been predictable and explicable on the basis of McLuhan's work.

The digital age now provides such an occasion. *Digital McLuhan* thus not only seeks to provide a guide to our digital age—the book's primary purpose—

but in so doing provides evidence of the underlying accuracy of McLuhan's thinking that was unavailable when he was alive.

To accomplish this double task, each chapter of the book will attempt to clarify a key insight, principle, or construct in McLuhan's work, and then discover what it tells us about tens of millions of people reading the Sunday papers, purchasing birthday presents, and even watching the equivalent of television on the Web, while those not online learn about it anyway in newspapers, magazines, movies, and TV shows.

THE GAME PLAN

We begin in the next chapter with a consideration of McLuhan's method—his professed preference for exploration over explanation, for demonstration via metaphor rather than logical argument, and his presentation of ideas about media in small packets, often as few as several paragraphs and rarely more than seven or eight pages. Strictly speaking, this is not about an insight into media effects nor a tool or construct McLuhan developed for assessing them. Rather, it is about McLuhan's way of doing business with his readers—his modus operandus. And yet not coincidentally, this turns out to bear a striking similarity to the way people communicate online, with comments on Usenet lists usually just a few paragraphs in length, and hot-linked titles and phrases on Web pages much like the glosses in bold—hot-links ahead of their medium—we find dispersed throughout the pages of McLuhan's books. Even in the examination of his method, we find in McLuhan a presaging of our age, an author struggling to communicate in an electronic pattern via the straightjacket of paper—a startling quicksilver mode in some sense consonant with the wheels of our intellect, but not as yet invented then in media.

Next, we turn to the core insight of McLuhan's entire agenda, also his best known and least understood: the medium is the message. Intended to call attention to the proposition that mere use of a medium is more profound in impact upon society than what individuals may do specifically with the medium—the world successively changed when people began talking on the phone, listening to the radio, watching television, logging on to the Web, not usually because of what they said, heard, and saw—it was roundly mangled into a contention that content is totally unimportant.

A moment's reflection shows why that cannot be. There is no such thing as a medium without content, for if it had no content, it would not be a

medium. McLuhan (1964, pp. 23–4) cites the electric light as a hypothet ical example of "pure information," or a medium without content, but then aptly notes that its content is what it shines upon and illuminates. In other words, the light bulb becomes meaningful to the extent that it illuminates something. A television with no programs could have no influence upon us as a medium, any more than a computer devoid of its very different kind of programs would be anything other than an interesting piece of junk. This is, indeed, just what became of many early personal computers due to their inability to access the Web, as soon as such access became crucial. They lacked the programs, and thus the content the programs delivered, necessary for the computer to function as a medium in the new environment. Content, in other words, is essential for "media-hood."

The Internet highlights another way in which the content of the medium aids our understanding of media. In McLuhan's quest to uncover the ordinarily hidden dimensions and effects of media—unnoticed because we focus on content and take the underlying medium for granted—he observed that media suddenly become more visible and attractive as objects of study when they are superseded by newer media, and become their new content. Thus, McLuhan's early work in literary theory showed him that the narrative structure of the novel jumped into public awareness after motion pictures adopted that structure as its content. By the 1960s, television would have the same effect on cinema, as universities created film schools to examine what was now available as content at all hours of the day in everyone's home. And in the decade after McLuhan's death, the VCR transformed the very structure and organization of television into content for the first time, directing the attention of its viewers to the relationship of commercials and programming (commercials could be "fast-forwarded" on the VCR), the subtleties of program timing (the taping could end several minutes before the end of the program, because the rest was taken up by commercials), and other aspects of television uncritically accepted when they were beyond viewer control.

But in the new millennium, the Internet is poised to trump each and every one of these prior "liberations" of media into content, because the Internet is making content of them all. What began as a medium whose content was text, and expanded in the 1990s to include images and sounds, has become at the turn of the new century a medium that offers telephone (Internet Telephone), radio (RealAudio) and television (RealVideo). The evidence and implications of the Internet as this grand medium of media will be among the continuing themes of this book.

Chapters 4 and 5 address McLuhan's discussions of "acoustic space" and "discarnate man," and therein consider the impact that the Internet as a whole has on our relationship to the world, and to one another. A prime concern of McLuhan's was the way the alphabet and the printing press encouraged us to see the world as a series of discrete sources and pieces, from which we could be easily detached, as when closing a book. According to McLuhan, such abstract, sequential vision had replaced an earlier, "acoustic" mode, wherein we perceived the world all at once, all around us, as a permeable extension of ourselves and we of it. Provocatively, McLuhan claimed that television was retrieving this mode—via screens that showed the same thing everywhere we turned. But regarding television as "acoustic" was a difficult feat, no matter how often McLuhan aptly quoted Tony Schwartz (1973) that television treats the eye as an ear.

The advent of cyberspace in the 1990s made it easier.

For the space that the computer screen invites us to join is indeed everywhere, but unlike the space on the television screen, it is potentially of our own making—we create it and remake it by using it—just like the acoustic space of the pre-literate environment. Further, the notion of being *in* cyberspace is much less counter-intuitive than being in the acoustic space of television. We go from one place to another on the Web and we feel as if we are moving through that space—a sense we do not usually have when jumping from one television station to another. The unmasking of cyberspace as acoustic space thus helps make each more explicable.

Denizens of cyberspace are virtual—meaning, our physical bodies play no role in our interaction with and in that space. McLuhan noted this "discarnate" effect when we talk on the phone, listen to the radio, or watch television, and wondered what impact it had upon our morality. But the experience on the phone is very different from the other two, in that we become discarnate when we talk on the phone—each party to the conversation is "sent," without accompanying body, in every word that is spoken—but only the viewed, not the viewer, is discarnate on television. The online participant is incorporeal in the same interactive way as the telephone conversationist, and on this key aspect the Internet is more like the telephone than television. Indeed, we will see throughout this book that the digital age has tap-roots in telephones and printing every bit as powerful as those in television, even though the digital age is brought to us on screens first made familiar on TVs.

Chapters 6 and 7 focus on the geo-political consequences of this revolution. McLuhan suggested that electronic media, television in particular, were turning the world into a "global village." The logic of this observation is immediately comprehensible and made the global village not only among the most often but also the most appropriately quoted of McLuhan's metaphors: we can all see the similarity between the world watching the Superbowl on television and villagers enjoying a local football game from their vantage point in a stadium. But there is more to village life than being a passive audience—villagers in a stadium can interact with one another and the players, and indeed the players may be villagers themselves—in contrast to the television audience, which consists for the most part of isolated family units, at irreducible arm's length from what they watch on the screen. Once again, the Internet helps complete McLuhan's metaphor, to the point of making it a reality. The online villager, who can live anywhere in the world with a personal computer, a telephone line, and a Web browser, can engage in dialogue, seek out rather than merely receive news stories, and in general exchange information across the globe much like the inhabitants of any village or stadium. Just as D.W. Griffith shattered the shell of the proscenium arch that had kept movie cameras, still under the spell of theater, from approaching the scene too closely, so has the Internet shattered the barrier that kept viewers bottled up with no input on the living-room side of their television screen.

The advent of computer screens not only as receivers but initiators of information in homes and offices around the world is further fulfilling another of McLuhan's observations about the global village—namely, that its dispersion of information is creating a new power structure whose "centers are everywhere and margins are nowhere." Radio and television networks began this process by broadcasting the same breaking news into everyone's homes and offices, and even motel rooms. From the point of view of access to this important information, the room with the best view could just as easily be in a shack off a desolate road in the middle of nowhere as a penthouse or office suite in NewYork City—all that counted was that the room have a television or radio (in a sense, this effect began with national news magazines, although their delivery was not immediate). But the sources of this information were still controlled by a handful of broadcast networks; in the television age, their corporate headquarters were meaningful centers indeed.

In the age of the Internet, in which anyone with a Web page can launch a news story, internationally, the corporate gatekeeping of news is finally beginning to subside. I learned about Princess Diana's tragic accident in August

1997 via an Associated Press bulletin forwarded by an individual on the Internet. Although some of the cable television stations were quick to pick up the story, an hour or more elapsed before all the major U.S. television networks joined in the coverage. Similarly, the Starr Report on Bill Clinton's sexual relationship with Monica Lewinsky (Office of the Independent Counsel, 1998) was available in its entirety to the world at large on the Internet at a time when only excerpts were quoted on radio and TV, and a day before its publication in newspapers.

The decentralization of our digital age pertains to more than news. Amazon.com became the third largest bookseller in the world within the first three years of its online operation (Nee, 1998). There is of course a centralized corporate structure in Amazon.com, but it is irrelevant in terms of the books that are offered for sale to its customers: unlike even the biggest physical bookstore, which can only shelve a given number of different books, the shelf space on Amazon.com—being virtual—is virtually unlimited.

And in many cases, the power of corporations to influence economic events, much like the power of governments to influence them, is melting in the light of personal computers and their empowerment of individual choice. Microsoft, the biggest corporation in the world, was unable to make its Windows 95 a thorough success, just as it has been struggling for years to attain a majority of the market for its Web browser, Internet Explorer: in both cases, the preferences of individual users, not the plans of the mega-corporation, prevailed. That is why lawsuits by the government to limit the power of Microsoft are unnecessary. The power is already limited by a decentralization, in significant part of Microsoft's own making, far more profound. Indeed, for anyone who understands McLuhan, the lawsuits are laughable—a quixotic effort by government, eager to demonstrate what little power it has left to regulate commerce, against an alleged monopoly whose very success has had the effect of obsolescing monopolies in the information business. Call it a tilting at Web mills.

McLuhan's examination of media looked not only at their impact on business, politics, and social life, but at the way they address and engage our senses—the locus of their primary psychological effect upon us, which is the basis of much of their social impact. Chapters 8 and 9 turn from our consideration of the global lessons of the digital age to a new look at the one-on-one relationship each of us has with our computer screen, our television screen, our books, our media.

For McLuhan, the specific way that we perceive the contents of each medium—the literal, physical method that each medium employs, the intensity and clarity of the information therein presented—governs not only how we use and what we derive from the medium, but its effect upon our overall society. Observing a common perceptual denominator in television and stained glass windows—both are animated by light behind the glass, which reaches our eyes after shining through it—McLuhan came to an astonishing conclusion about television: it draws and commands our attention with an almost hypnotic, religious intensity, because that is the way our senses and brains respond to a "light-through" invitation. Stainedglass windows—and, I would add, blue skies—partake of this sensory appeal. Paintings, books (other than those comprised of illuminated manuscripts, the medieval simulation on pages of light-through), newspapers, and motion pictures do not; rather, their contents are conveyed to us via light that bounces on and off of them. Thus, on this sensory basis alone, we can see the advantage of television over both books and motion pictures. Since computer screens also operate via light-through, they convey the benefits of books while maintaining the sensory appeal of TV.

"Light-through" is likely among the least known of McLuhan's comparative gauges of media. Like "acoustic space" and "discarnate man," it is appreciated among some inner circles of media theorists, but never achieved the iconic status of "the global village" or the mantric appeal of "the medium is the message." "Hot and cool"—a sensory comparison that McLuhan borrowed from jazz slang to denote media of high and low profile—went its own different way. An early star in the mid-1960s, at least as well known and associated with McLuhan as the global village and the medium is the message, it fell sharply out of style after McLuhan's death in 1980, and today has about it an almost charming, antique patina. Its one consistency throughout the decades is the large amount of misunderstanding it has generated—which, unlike the medium is the message, is due to some inherent difficulties, or unannounced subtleties, in the concept.

The crux of hot and cool is that media which are loud, bright, clear, fixed ("hot" or high definition) evoke less involvement from perceivers than media whose presentations are soft, shadowy, blurred, and changeable ("cool" or low definition). The psychological logic of this distinction is that we are obliged and seduced to work harder—get more involved—to fill in the gaps with the lower profile, less complete media. Thus, we might pore over a few lines of poetry more than a few lines of prose, study a political cartoon for meaning more than

a crystal-clear photograph, get hooked on the shimmering images of the little screen of television more than the big bold images in the movie theater.

That last example shows the strengths and weaknesses of the hot-and-cool dichotomy. The revelation that television pulls us into its cool images to see what is on the other side dovetails nicely with the same effect that television has upon us as a light-through medium. It is true that TV is small and blurry in comparison to the motion picture screen, which is thus not only light-on but hot in this McLuhanesque reading. But when we inquire more fully into why TV might be more involving than motion pictures, we notice that the two differ on another crucial criterion—namely, that television is available to us twenty-four hours a day in our homes, whereas motion pictures on the theater screen can be had only by going out to the movies and paying for the experience. This difference alone could easily account for how television could be more addictive than motion pictures, with no reference to hot and cool, or light-on versus light-through, at all.

Other non-perceptual factors can account for hot-and-cool effects of other media. McLuhan correctly noted that radio and phonograph recordings ("hi-fi" or "high-fidelity" in the late 1950s and early 1960s) provided much fuller sound than the telephone, which was thus cool and much more involving. But the telephone invited participation for a much more practical and obvious reason: unlike the radio and the phonograph, the phone provided the listener with a live, interacting person on the other end of the connection. Whatever the heat or coolness of radio and recordings, they could never warrant the level of involvement of telephone, for the plain reason that they are deaf to the voices of their listeners (unless, of course, someone calls a radio station on the phone—in which case, the addition of the phone makes radio interactive).

And radio poses another problem for hot/cool analysis. How is it that radio, a sound-only medium, can be hot, while television with its audiovisual presentation can be cool? Surely sound is less than sight-and-sound? We can answer this one with the qualification that hot and cool works best for media of the same modality—motion pictures and TV, prose and poetry, cartoon drawing and photograph—and not for cross-media comparisons such as radio and TV. But we are still left with the unavoidable result that hot and cool is a rather mercurial measure of media effects, which (perhaps apropos of the somewhat disenchanting spin it puts on clarity) can confuse as much as clarify.

Nonetheless, its elucidations are impressive, and it and they are included in this book because we need all the help we can get in furthering our understanding

of the new digital age. Text online has been more addictive than books and newspapers ever since its public inception in the 1980s, when early commercial systems such as CompuServe and the Source would charge by the hour, and people who could ill afford the cost would spend a thousand dollars or more a month and still continue logging on. The interactivity—sometimes live, usually asynchronous—with other people online certainly explains a large part of the attraction. But there was something in those primordial, low-profile screens—just letters of one shade on a dark background, dim and drab in comparison to the bright screens of today—that was powerfully alluring, and made me think of McLuhan and cool media writ in phosphor the first time I logged on to a computer network, almost fifteen years ago.

To write is usually to want to publish—a diary would be the exception—and in Chapter 10 we return to the social arena to consider what the Web has made of McLuhan's proposition that the xerox was turning every author into a publisher. The initial formulation of course had more than a dash of hyperbole. Even the cheapest paperback looks and feels more like a published book than the sharpest photocopied manuscript, and the author with photocopied "publications" in hand has no ready way of getting them into public distribution. The Web is a great equalizer on both accounts. Authors with the requisite minimal knowledge of Hyper Text Markup Language (html) and sense of Web-page design can create online pages for their publications as attractive as those put up by the biggest corporations online, and the Web is a universal distribution system whose pages can be accessed by anyone with a Web browser. But this revolution in publishing is still decidedly incomplete: Amazon.com's huge business is in selling, via the Web, traditionally published books.

Whether the buoyance of the book printed and bound is an expression of the nostalgia all of us who have grown up with it feel for it, or an indication of deeper levels of satisfaction we derive from words permanently affixed to pages—*Digital McLuhan* will examine both factors, and I suspect both are at work here—the currents of change swirling around books and newspapers are all headed in one overall direction: a washing away, an overwhelming, of traditional gatekeeping in media. When means of dissemination were handwritten and thus at their scarcest, the Church served as gatekeeper for sacred and lesser-blessed but still worthy text. The printing press took down this gate, but installed in its stead the government and soon commercial enterprises to regulate the new flow of information. In the twentieth century, the broadcast media of radio and television radically increased the flow of

information again, yet government and commercial gatekeeping continued unabated—indeed, even increased in authority, since publishing a book is considerably less expensive than producing a television program, which until the advent of cable provided only a handful of possibilities for appearing on television screens in any case. McLuhan was thus entirely right, even prescient, to seize upon the xerox as an extraordinary reversal of this trend. The question for gatekeeping in the digital age will be: with the Web removing the technological and economic reasons for the pre-sorting of information, will the public still look to gatekeepers to provide an imprimatur of what is best to read, see, and hear, or will audiences seek out and ratify a more direct relationship with creators?

Chapters 11, 12, and 13 consider how digital facility with information may be changing our very notion of "best," and how it relates to our interconnected conceptions of work, play, and art. McLuhan not only had a genius for apt phrases, he had a keen eye for picking them out from the discourse of others, and frequently quoted the saying of the Balinese that "We have no art, we do everything well." Along with acoustic space and the global village, McLuhan saw this pre-industrial attention to detail, this goal of working to perfection, as returning in an electronic age in which expert knowledge was increasingly available to everyone. As has been happening in so many other aspects of our lives, the personal digital age has done one better than the mass electronic age in this regard, giving us not only access to information twenty-four hours per day but the wherewithal to apply that information, to contribute to society, to even work at a growing number of jobs any time night or day, from any place in the world, including our homes.

The source of this enhanced capacity for work is of course the personal computer, also a place where our children (and we) play games, and via which we surf the Web for fun as well as profit. "Serfs to Surf" (Chapter 11 of this book) examines some of the background and likely consequences of this new, digital blurring of work and play. Although television in its recently departed classic age no doubt mixed entertainment with news and business (in the form of commercials), it provided few outlets for direct purchase of goods and services, and none at all for production and distribution of work from the home; business in those days by and large could only be conducted outside of the home, in physical public. In contrast to such sharp demarcation, the personal computer from the outset was a vehicle both of work (word processing, data management, telecommuting) and pleasure. Indeed, the

polarity of DOS (business) and Macintosh (fun) applications captured this double function, whose ultimate synthesis in Windows was inevitable, given that the actual differences between DOS and Mac programs were minimal in comparison to personal computers versus any media that came before. Whether the fun of surfing the Web will continue when the novelty wears off, whether the work produced in such flexible circumstances will be better in the long run, whether family life will be improved in all respects by the capacity to work at home, is not yet known. But the robust levels of economic growth in the United States at the end of the 1990s—rising GNP, declining unemployment—suggest that, in the most Web-connected nation in the world, at least, the new mixture of work and play is producing a fine harvest.

Chapter 12 looks at the other end of work and pleasure in relation to technological progress, particularly McLuhan's view that outmoded technologies become art forms. As a corollary to his warning that technologies are essentially invisible when in peak use—we might say that they are all like the blades of whirring fans, upon which the unwary might well cut their fingers—McLuhan noticed that technological workings suddenly become clear, as if pushed onto center stage, when another technology takes over even part of their job and begins pulling some of the strings. One aspect of this, as we saw in our discussion of "the medium is the message," is that older media become the high profile content of newer media, as novels in motion pictures, motion pictures in TV, and almost all prior media on the Internet.

Another aspect is that some superseded technologies become appreciated not for their actual output or function, but for the sheer pleasure of experiencing them—as we would look back at and enjoy a work of art. McLuhan's favorite example of this effect concerned the Earth itself, which became an art form—a thing of beauty to be admired and preserved as a whole, as if Gaia were an endangered species—when Sputnik circled our planet, and for the first time gave us a perspective from beyond it. My own two favorite examples (a key enjoyment in reading McLuhan's work is coming up with your own examples) are delicatessen meats and being cool in convertible cars. Ham, corned beef, and similarly treated food were once cured for the practical purpose of preservation; when electric refrigeration was developed to do a much better job of that, people began to consume cured foods almost entirely for their taste. Around that very same time, people drove in convertibles in summer to keep cool; by the 1960s, air-conditioning in cars had all but eradicated the convertible; in the 1980s,

the convertible returned—its occupants wanted to be cool, but now in a stylistic more than a physical sense.

As medium after medium moves from its traditional stand-alone position to become content on the Internet, we can expect a commensurate increase in the public's appreciation of those older media as art. The look and design of print on paper is already beginning to receive such attention—see the front-page layout of any newspaper in comparison to what front pages looked like a hundred years ago—just as handwriting became the art of calligraphy in the age of print. The appearance of television on screens attached to keyboards and trackballs will make it not only newly viewable but malleable in its contours, and this invitation to experiment with the size and shape of the TV screen, and its relation to other windows, will result in an increased awareness of what are now the underlying aesthetics and structures of the televised image. A small first step in that direction has already occurred in the repackaging of 1950s TV situation comedies—such as *I Love Lucy* and *The Honeymooners*—for presentation on cable television stations as "classics," replete with commentary at the beginning about their comedic significance. The availability of nearly 100 cable channels in many areas of the United States constitutes an enormous increase in choice over the handful of broadcast channels which was all that television had to offer in the 1950s, but the Internet has the potential to offer vastly more, and may soon make even cable TV an "Internet, lite."

But will this increase in art a la McLuhan—this shift in many older technologies from our unthinking use to our critical appreciation of them—result in a net improvement of society? In other words, granting that the Internet does indeed afford us more time and opportunity for the careful attention to activities typical of art, will this translate into the Balinese supposition of doing all of that well? Chapter 13 considers some of the prospects and pitfalls for genuine improvement of our ways of life and business in the digital age. On the one hand, rapid access to diverse information certainly facilitates better performance in any task that requires research, which cuts a wide path across medical, legal, academic, and many commercial professions. On the other hand, there can be a sense of accomplishment and relationship in the virtual realm which is illusory, or at least incomplete, until full flesh-and-blood people have shaken hands, and tangible things have been moved.

To the extent that pre-industrial Balinese were indeed able to do everything well—given the deception attendant to most self-appraisal—this presumably was due to the smaller number of tasks in their world, and the consequently

greater amount of time they could devote to each, in comparison to less time for more tasks in the Industrial Age. Digital processing of data effectively increases the amount of time we can devote to each task when it provides information essential to the task more quickly; and successful completion of more tasks gives us access to the bigger picture of interrelated tasks, which is also helpful. So far, so good: we seem well on the way to Bali Ha'i.

But the irreducible grounding of many tasks in physical reality and their refractory time frames—the Internet, after all, cannot move an orange from California to London any faster than the fastest plane, nor can the Web do anything about the time it takes an orange to grow—is an everpresent anchor on the digital surge, ever ready to bring it back down to Earth. In the end, we may well need to settle not for doing everything well, but for some of us doing some things better—which isn't too bad, either.

Peering into the future brings us to the last two chapters in this book, where we find McLuhan segueing from tour guide for our world—a world twenty years after his demise—to docent of further worlds beyond. Consistent with McLuhan's abstention from explanation and overarching theorization, he also refrained from systematic, detailed predictions of the future. His forte was rather the sudden dive into the past, to retrieve some sparkling gem from the ocean deep to help illuminate our present state of affairs back up on the surface. Thus, we have the global village, acoustic space, stained glass windows all shedding light, first on McLuhan's world of the 1950s through the 1980s, and now on the digital age in which we reside, an age which is just beginning. But McLuhan also left us, if not explicit predictions of the future, two very valuable conceptual tools to help us navigate its pathways. One, the "rear-view mirror," is designed to alert us to errors in perception, traps we may fall into, along the way. The other, the "tetrad" or "laws of media," was intended to uncover panoplies of possibilities, and how they relate to past and current effects of media.

The rear-view mirror—subject of Chapter 14—is, like the global village, among McLuhan's easiest to understand and most powerful insights. In fact, the rear-view mirror is probably my favorite. We move into the future with our sight on the past. How true that is, and how aptly the rear-view mirror in the automobile metaphorically captures that effect. Its linguistic traces are all around. The telephone was first called the talking telegraph, the automobile the horseless carriage, the radio the wireless. But each of these technologies was much more—the telephone breached the privacy of our home, the

automobile empowered countries which had oil, radio became a nationwide simultaneous mass medium—and since none of these consequences were picked up in the initial retro-labels, those rear-view mirrors distracted us from crucial developments.

The Internet, of course, is seen in a rear-view mirror par excellence. Its critics are prone to see it as a television screen; its devotees, including me, are inclined to see it as an improved kind of book. But the truth of the matter, yet to be fully determined, is that the Internet is and will be a combination and transformation of both books and TV, and other media such as telephone as well, and thus is something much more, much different from any prior media. The rear-view mirror cannot tell us what that is, but it can remind us not to get too mesmerized by reflections of the immediate past. The driver who looks only into the rear-view mirror, or even too often, and accords consequently short shrift to the road ahead and its new possibilities can quickly end up on the side of the road, or worse.

McLuhan's "tetrad"—or four laws of media—shifts gears from warning us that we need to sometimes take off our past-tinted glasses when looking at the future, to indicating what kinds of territory we might see there when those glasses are removed. McLuhan says four questions can be asked of any medium and its impact. What does it enhance or amplify in the culture? What does it obsolesce or push out of prominence? What does it retrieve from the past, from the realm of the previously obsolesced? And—and here the tetrad projects into the future—what does the medium reverse or flip into when it reaches the limits of its potential? Radio, for example, enhanced oral communication across great distances; obsolesced aspects of written communication, such as the newspaper as the leading edge of news delivery; retrieved some of the prominence of oral communication from pre-literate times; and reversed into broadcasts of sounds and images—television. The new medium can in turn be similarly examined. Television enhances instant visual long-distance communication; obsolesces aspects of sound-only radio, whose serials and soap operas moved to TV; retrieves some of the visual elements that radio had obsolesced, such as the cartoon; and reverses into Well, we are not entirely there yet, but certainly oligarchic network television has reversed into such diverse but overlapping media as cable, VCRs, and the Internet.

Chapter 15, the final chapter in our voyage, applies the tetrad to these new media of our early digital age, and looks especially at their possible areas of reversal. Might the Internet, with its democratization of

communication, its scoffing at gatekeeping, reverse in the next turn of its tetrad into a Web in which choice is a sham, where every hot-link on a page leads to a pre-determined info-dump, mandated by the government or some other resurgent central authority as in the movie *Starship Troopers* (1997)? Or are the centrifugal forces that the digital age has already unleashed so powerful, so quickly on their way to becoming universal, that they will pull the tetrad wheel away from any re-entry of a totalitarian past?

The tetrad is unique in Dr. McLuhan's bag of instruments to gauge the health, status, heartbeat, prognosis of our media. Although it is more systematic than any of his other constructs—every medium in history is subject to the four laws—it is nonetheless open-ended and multi-dimensional. Each medium enhances, obsolesces, retrieves, reverses into many more than one thing or effect. Television retrieves the cave painting, the billboard, the newspaper cartoon, and reverses not only into the Internet, cable, and the VCR but holography, the videophone (which of course is also one of the many media the telephone flips into) and much more. Clearly, McLuhan was attempting to do something new with the tetrad—to create something which approached a general theory of media, without the rigidity and confinement of possibilities which are usually the purchase price of theories. But he never got the chance.

He managed only two small, published essays about the tetrad before his death in 1980 (McLuhan, 1975, 1977a). The laws of media were not able to make their first house-call to the world-at-large until 1988, when the book by that name, co-authored by Marshall and Eric McLuhan, was at last published.

The tetrad also has a personal uniqueness to me: I wrote the Preface to the second article McLuhan published about the tetrad—"Laws of the Media" in the journal *et cetera* in 1977. I was a doctoral student then, and although I had already studied McLuhan's work at length, that Preface initiated a brief, exhilarating period of time in which I not only read McLuhan's work, but worked with him through correspondence, phone calls, and the occasional meeting in Toronto or NewYork.

The tetrad thus not only serves as the culmination of this book, but provides apt occasion for the conclusion of this chapter, where we will situate Marshall McLuhan in relation to his colleagues, co-authors, and those in the scholarly world who continue to further his work.

McLUHAN & COMPANY

One indication of the extent to which McLuhan relied on co-authors is that only three of his books—*The Mechanical Bride* (1951), *The Gutenberg Galaxy* (1962), and *Understanding Media* (1964)—were written without collaboration. All of the others—*The Medium is the Massage* (McLuhan & Fiore, 1967), *War and Peace in the Global Village* (McLuhan & Fiore, 1968), *Through the Vanishing Point* (McLuhan & Parker, 1968), *Counterblast* (McLuhan & Parker, 1969), *From Cliché to Archetype* (McLuhan & Watson, 1970), *Take Today* (McLuhan & Nevitt, 1972), *City as Classroom* (M. McLuhan, Hutchon & E.McLuhan, 1977), and the posthumously published *Laws of Media* (M. McLuhan & E. McLuhan, 1988) and *The Global Village* (McLuhan & Powers, 1989)—were co-written with the authors indicated in parenthesis. *(Culture is Our Business,* written solely by McLuhan and published in 1970, is essentially an update of *The Mechanical Bride; Verbi-Voco-Visual Explorations* is a revised 1967 reprint of number 8 of the journal *Explorations,* which McLuhan edited with Edmund Carpenter; McLuhan and Carpenter also edited *Explorations in Communication* in 1960.)

A counter-indication of McLuhan's indebtedness to co-authors, however, becomes clear when we realize that *The Gutenberg Galaxy* and *Understanding Media*—two of McLuhan's three solo works—have been far and away his most influential books. Indeed, examination of his subsequent books reveals that, although they continue to offer some new examples, the insights and metaphors and media relationships they illuminate—such as the global village, hot and cool, light-through versus light-on, and, of course, the medium is the message—are all already writ large in his second and third books. *Laws of Media* is a partial exception, but retrieval was already on stage in the global village, and reversal was the subject of a chapter—"Reversal of the Overheated Medium"—in *Understanding Media*. Enhancement and obsolescence—the replacement of one medium in prominence by another—are obviously major themes throughout McLuhan's work, in particular the obsolescence of the oral by the literate, and then the literate by the electronic. *Digital McLuhan* can be seen as an examination of the obsolescence of the early, mass-electronic milieu by our current electronic digital environment—a replacement which both enhances the world-wide reach of earlier mass electronic media, yet retrieves literate culture via the reliance of the personal computer and its Web applications on the written word. What was unapparent when McLuhan and all but his posthumous collaborators wrote was that the elec tronic media

of their time were but the root of an electronic digital age on the verge of springing into being—a one-way, mass-media caterpillar yet to burst into the digital butterfly, if you prefer your metaphors winged.

Since the presentation of McLuhan's co-authored books makes it impossible to determine which of the authors wrote what text in a given volume—and since, as indicated above, the insights in the co-authored texts are found in the earlier books solely of McLuhan's authorship—I will, for brevity's sake, refer to quotes and ideas discussed throughout this book as "McLuhan's," while of course listing any co-authors in the bibliographic reference immediately following the quote (for example: McLuhan & Fiore, 1967).

Books solely written by McLuhan's collaborators, or books written about McLuhan and his ideas, are of course a different matter. Yet, significantly, only one book by a McLuhan colleague—Edmund Carpenter's *Oh, What a Blow that Phantom Gave Me!* (1972 /1973)—stands out as making a contribution essential to our understanding of the digital age, and indeed that will be the only book of its kind quoted in this volume. As for early critical works about McLuhan, they are alas usually distinguished by a stark misunderstanding of their subject—see, for example, Jonathan Miller's *Marshall McLuhan* (1971) and its deadpan explanation that McLuhan applies "hot" to incomplete, low-profile media, or completely the reverse of McLuhan's usage—and will be cited in this volume as such.

Beyond McLuhan's collaborators and critics, we have a small but growing group of authors who have applied and extended McLuhan's work to new areas. Neil Postman (e.g., 1985, 1992) has mined the dark side of McLuhan, contending that regardless of how newsworthy, educational, and otherwise culturally erudite the content of television may appear, its underlying message—the result of watching it, whatever the program may be—is destructive of rationality, courtesy, and many of the finer things of civilization. Jim Curtis' *Rock Eras* (1987) applies the tetrad to rock 'n' roll. Joshua Meyrowitz's *No Sense of Place* (1985) develops the social and political implications of McLuhan's observation that life at electronic speed blurs distinctions between work and art, business and pleasure.

Much of this scholarship was interconnected, and informed by personal relationships among authors that continue to this day. I first became acquainted with Jim Curtis when I reviewed his *Culture as Polyphony* (1978) for the journal *Technology and Culture* (Levinson, 1979b); I noted his analysis of Russian and American Southern culture as "cool" and acoustic, and we struck up a

correspondence and a friendship. His *Rock Eras* (1987) not only uses McLuhan's tetrad, but a particular elaboration of the tetrad that I developed—tetrad "wheels" of evolution—which is discussed in Chapter 15 of *Digital McLuhan*.

Josh Meyrowitz sat right next to me in seminars of the doctoral program at NewYork University—the "Media Ecology" Program, headed by Neil Postman—from 1975 through 1978, where our relationship rapidly developed from spirited sparring over minor details to lifelong friendship and a recognition that we both saw the world of media essentially the same way. That core vision derived from Marshall McLuhan. I went on in the years that followed to integrate that vision with the philosophy of Karl Popper, the evolutionary epistemology of Donald Campbell, and even some of the logical analysis of technological possibilities found in the science fiction of Isaac Asimov. Meyrowitz mixed his McLuhan with the perspectives of sociology, most especially the work on public and private personas by Erving Goffman. Although *No Sense of Place* (1985) was just a bit too early to catch the full drift of the digital revolution—the book is much more an assessment of television than computers—its comprehensive treatment of fading distinctions and boundaries in electronic mass media offers an important prelude to the frontal assault on gatekeeping in the digital age that is one of the main themes of *Digital McLuhan*.

Neil Postman was not only the intellectual leader of the program in which I earned my Ph.D., he was also my doctoral dissertation adviser. In view of his scathing critiques of television and computers, and my opposing arguments that they are both far better for our culture than Postman allows, and radically different in any case in their effects, I have often been moved to quip that Postman was my biggest failure in which I was a teacher—in this case, a doctoral student attempting to "teach" his mentor about media. But the deeper truth is that Postman was and is a superb teacher in conveying why McLuhan must be taken seriously.

Indeed, Postman and his doctoral program were responsible for several crucial stages in the intellectual and personal relationship I came to enjoy with McLuhan, especially its beginnings. My first published scholarly article—in the *Media Ecology Review,* a publication of the Media Ecology Program at NYU—was entitled "'Hot' and 'Cool' Redefined for Interactive Media" (1976), and its thesis that hot and cool distinctions work differently in passive one-way media like radio and interactive two-way media such as telephone points directly to new applications of McLuhan in our more interactive digital age.

By 1977, I had published two other pieces pertinent to McLuhan's work, in *et cetera*—the Journal of the International Society for General Semantics—which had recently come under Postman's editorship. "Toy, Mirror, and Art" (1977b) presented a full-fledged original theory about the developmental stages of individual media; its relevance to McLuhan and play, work, and art in the digital age is explored in Chapter 11 of this book. That same issue of *et cetera* contained McLuhan's "Laws of the Media" (1977a) along with my Preface to it. (The issue is quite a classic—it also contained Meyrowitz's "The Rise of 'Middle Region' Politics," and its analysis of the erosion of the political hero in the post-JFK television age.) I had come to write such a Preface because Postman had given a draft of McLuhan's article to me, asked for my thoughts, and then for me to commit them to writing. Marshall was of course shown my Preface to his article prior to publication. We met shortly after in New York City, and commenced an all-too-brief period of several years of correspondence and visits in Toronto and NewYork, including a "Tetrad Conference" I organized at Fairleigh Dickinson University in 1978, featuring Marshall and Eric McLuhan.

There is a discrepancy I have noticed, which almost seems inevitable, whenever I meet in person someone whose creative work I have first come to greatly admire in books and recordings. It is almost as if authors and songwriters pour out their very best in their professional expressions, so that a conversation with them in person cannot possibly measure up to expectations. Marshall McLuhan was the one person I came to know who was an incandescent exception. The walks we took around his home in Wychwood Park, the conversations over dinner, on the phone, in the halls between panels, were every bit as brimming with brilliant insights and wild but somehow sensible connections as his written correspondence and books and articles. Indeed, sometimes a toss-away line in a casual conversation could pack far more punch than McLuhan's written expression, or perhaps clarify it in a way the printed page could not. Throughout this volume, I will thus on occasion quote a nugget or two from our conversations.

The opportunity for continuing such discourse ended with McLuhan's death in 1980. My "McLuhan and Rationality" (1981a), already in press, was published in the *Journal of Communication* the following summer; "McLuhan's Contribution in an Evolutionary Context" (1981b) was published in *Educational Technology* that same year.

"Marshall McLuhan and Computer Conferencing" was not published in the *IEEE Transactions of Professional Communications* until 1986. But it was

written in August of 1984, two months after I had logged on and participated in my first online discussions (hosted by the Western Behavioral Sciences Institute) via a Kaypro II CP/M personal computer and a 300–baud modem. The article suggests that McLuhan's oft-criticized, bite-sized, overlapping-little-essay style was in fact a form of online, electronic text, stuck on paper in a media environment which had not yet caught up to the speed and multi-dimensionality of McLuhan's mind. As far as I know, that article was the first by anyone to make a connection between McLuhan and modes of expression in the digital age, and can be considered the seed from which this book arose.

My *Mind at Large: Knowing in the Technological Age* (1988b) was more about technology as an embodiment and vehicle of knowledge than it was about communications media per se; but its intellectual debt to McLuhan's scope and subject, if not his style, was nonetheless enough that I dedicated that book to him. I published letters in *The NewYork Times* (1981c) and Canada's *Saturday Night* (1988a), pointing out typical misunderstandings of his ideas that continued unabated after his death. My letter to *Saturday Night* also discussed another problem that *Digital McLuhan* by its very existence seeks to address: the incorrect view that McLuhan has had no lasting impact on the world.

In 1990, *the Journal of Communication* published my "McLuhan's Space," a major essay/review of Marchand's biography (1989), Marshall and Eric's *Laws of Media* (1988), McLuhan & Powers' *The Global Village* (1989), and McLuhan's *Letters* (edited and assembled by M. Molinaro, C. McLuhan & W. Toye, 1987), in which I argued for the first time that McLuhan's notion of "acoustic space" was none other than our cyberspace. *WIRED*—aptly listing McLuhan as "Patron Saint" on its masthead—published an updated (but shortened) version of that essay/review in 1993, and McLuhan figured in three of the six articles I published in *WIRED* in the following years (Levinson, 1994a, 1994b, 1995c).

McLuhan's pertinence to the digital age was now well established, if still only barely explored and utilized.

In March 1998, Lance Strate organized a "McLuhan Symposium" at Fordham University. Neil Postman, Joshua Meyrowitz, and James Curtis presented papers, as did I and more than two dozen other scholars who had been stimulated by McLuhan's work as far back as the 1950s. *Digital McLuhan* was mostly drafted then, and the paper I presented—"Way Cool Text through Light Hot Wires" (1998c)—was an adaptation of Chapter 9. A

good smattering of the papers touched upon or more fully addressed the relevance of McLuhan to new media, and I strongly recommend the anthology of essays deriving from that conference which Lance Strate and Ed Wachtel are editing for publication, likely in 2000.

In the meantime, *Digital McLuhan* provides an assessment of McLuhan's method (the next chapter) and then 13 of his major insights and what they can tell us about the new world we are well on the way to creating.

Now that McLuhan has been rediscovered—though he was never really lost—I suspect that books about McLuhan, tracts that extend his work, will be appearing with increasing frequency. In such an emerging milieu, I think it especially important that McLuhan's original work be kept close at hand. Interpretations, including this one, inevitably recast the original, and are thus as prone to overlook as bring into better focus an important point.

Accordingly, although *Digital McLuhan* will occasionally quote from an appropriate interpretation, it will rely as much as possible on what McLuhan himself actually wrote or said.

Consider it a continuation of a discussion between McLuhan and me, in which I may have the last word but McLuhan has the upper hand….

BIBLIOGRAPHY

Advertisement (1998) for *Interactive Excellence* by E. Schlossberg, *The NewYork Times,* 23 July: G8.

Agassi, J. (1968) *The Continuing Revolution,* NewYork: McGraw-Hill.

——(1982) "In search of rationality—a personal report," in P. Levinson (ed.) (1982).

Annie Hall (1973) Motion picture directed by Woody Allen.

Asimov, I. (1945) "The mule" (concluding part 2) *Astounding Science Fiction,* December: 60–97, 148–68.

——(1951) *Foundation,* NewYork: Gnome.

——(1952) *Foundation and Empire,* NewYork: Gnome.

——(1953) *Second Foundation,* NewYork: Gnome.

Aufderheide, P. (1997) Review of *The Soft Edge: A Natural History and Future of the Informa-tion Revolution* by P. Levinson, *In These Times,* 19 October: 32–3.

Barlow, J.P. (1994) "The economy of ideas," *WIRED,* March: 84–90, 126–9.

Bazin, A. (1967) *What Is Cinema?,* trans. H. Gray, Berkeley, CA: University of California Press.

Beatty, J. (1998) "A capital life," Review of *Titan: The Life of John D. Rockefeller, Sr.* by R. Chernow, *The NewYork Times Book Review,* 17 May: 10–11.

Bedazzled (1967) Motion picture directed by Stanley Donen.

Bell, D. (1975) "Technology, nature, and society," in *The Frontiers of Knowledge,* Garden City, NY: Doubleday.

Benzon, W. (1993) "The United States of the blues: On the crossing of African and European cultures in the 20th century," *Journal of Social and Evolutionary Systems,* 16, 4: 401–38.

Bester, A. (1957) *The Stars My Destination,* NewYork: Signet.

Birkerts, S. (1994) *Gutenberg Elegies: The Fate of Reading in an Electronic Age,* Boston: Faber and Faber.

Bliss, M. (1988) "False prophet," Review of *Letters of Marshall McLuhan,* selected and edited by M.Molinaro, C.McLuhan and W.Toye, *Saturday Night,* May: 59–60, 62.

Blisset, W. (1958) "Explorations," *Canadian Forum,* August.
Brand, S. (1987) *The Media Lab,* NewYork: Viking.
——(ed.) (1985) *The Whole Earth Software Catalog for 1986,* San Francisco, CA: Point.
Broder, J. (1998) "Gore to announce 'Electronic Bill of Rights' aimed at privacy," *The New York Times,* 14 May.
Bronner, E. (1998) "Voracious computers are siphoning talent from academia," *The New York Times,* 25 June: A1, 14.
Brooks, J. (1976) *Telephone: The First Hundred Years,* NewYork: Harper & Row.
Brooks, T. and Marsh, E. (1979) *The Complete Directory to Prime Time Network TV Shows, 1946-present,* NewYork: Ballantine.
Bush, V. (1945) "As we may think," *The Atlantic Monthly,* July: 101–8.
Butler, S. (1878/1910) *Life and Habit,* NewYork: Dutton.
Butterfield, F. (1997) "Crime fighting's about-face," *The New York Times,* 19 January, sec. 4:1.
Campbell, D.T. (1974a) "Evolutionary epistemology," in P.Schilpp (ed.) *The Philosophy of Karl Popper,* La Salle, IL: Open Court.
——(1974b) "Unjustified variation and selective retention in scientific discovery," in F.J. Ayala and T.Dobzhansky (eds.) *Studies in the Philosophy of Biology,* Berkeley, CA: University of California Press.
Capra, F. (1975) *The Tao of Physics,* NewYork: Bantam.
Carpenter, E. (1972/1973) *Oh, What a Blow that Phantom Gave Me!* NewYork: Bantam.
——and McLuhan, M. (eds.) (1960) *Explorations in Communication,* Boston: Beacon.
Carson, R. (1962) *Silent Spring,* Boston: Houghton Mifflin.
Cohn, D.L. (1951) Review of *The Mechanical Bride* by M.McLuhan, *The NewYork Times,* 21 October.
Curtis, J. (1978) *Culture as Polyphony: An Essay on the Nature of Paradigms,* Columbia, MO: University of Missouri Press.
(1987) *Rock Eras: Interpretations of Music and Society, 1954–1984,* Bowling Green, OH: Bowling Green State University Popular Press.
Cziko, G. and Campbell, D.T. (1990) "Comprehensive bibliography: Evolutionary epistemology" *Journal of Social and Biological Structures,* **13, 1:41–82**.
Dawkins, R. (1976) *The Selfish Gene,* NewYork: Oxford University Press.
Dennis the Menace (1993) Motion picture directed by Nick Castle.
Dizard, W., Jr. (1997) *Old Media, New Media,* 2nd ed., White Plains, NY: Longman.
Dunlap, O.E., Jr. (1951) *Radio and Television Almanac,* NewYork: Harper & Bros.
Dyson, E. (1997) *Release 2.0:A Design for Living in the Digital Age,* NewYork: Broadway.
Ebert, R. (1995) Review of *Theremin: An Electronic Odyssey, Chicago Sun-Times,* 15 December.
Edmundson, M. (1997) Review of *Marshall McLuhan: Escape Into Understanding: A Biography* by W.T. Gordon, *The NewYork Times Book Review,* 2 November: 38.
Ellul, J. (1965/1973) *Propaganda: The Formation of Men's Attitudes,* trans. K.Kellen and J. Lerner, NewYork: Vintage.
Engdahl, S. (1990) "The mythic role of space fiction," *Journal of Social and Evolutionary Systems,* 13, 4:289–96.

Ferrell, K. (1996) Personal conversation about *Omni* magazine with its former editor, White Plains, NY, 12 July.
Forster, E.M. (1951) *Two Cheers for Democracy,* NewYork: Harcourt, Brace & World.
Freud, S. (1930) *Civilization and its Discontents,* trans. J. Riviere, New York: Cape and Smith.
From the Earth to the Moon (1998) Cable-tv series, HBO-TV, produced by Tom Hanks, Part 12, 10 May.
Fromm, E. (1941) *Escape from Freedom,* NewYork: Rinehart.
The Fugitive (1993) Motion picture directed by Andrew Davis.
Genie (1991–1998) (formerly: General Electric Network for Information Exchange) Online discussion in the Science Fiction Round Table.
Gibson, C.R. (n.d.) *The Wonders of Modern Electricity,* Philadelphia, PA: McKay.
Gordon, W.T. (1997) *Marshall McLuhan: Escape Into Understanding: A Biography,* NewYork: Basic Books.
Gore, A. (1998) Commencement address at NewYork University, 14 May.
Grave, W.W. (1954) "Cambridge University," *Encyclopedia Britannica,* vol. 4, Chicago: Encyclopedia Britannica.
Gray, T. (1751) "Elegy written in a country churchyard," reprinted in O. Williams (ed.) *Immortal Poems of the English Language,* NewYork: Washington Square Press, 1952.
Greenhouse, L. (1997) "Court, 9–0, protects speech on Internet," *The NewYork Times,* 27 June: A1, 20.
Head, S.W. and Sterling, C.H. (1987) *Broadcasting in America,* 5th ed., Boston: Houghton Mifflin.
Heelan, P. (1983) *Space-Perception and the Philosophy of Science,* Berkeley: University of California Press.
Heim, M. (1987) *Electric Language,* New Haven, CT:Yale University Press.
Heinlein, R. (1959) *Starship Troopers,* NewYork: G.P. Putnam's.
Heyer, P. (1995) *Titanic legacy,* Westport, CT: Praeger.
Hiltz, S.R. and Turoff, M. (1978) *The Network Nation: Human Communication via Computer,* Reading, MA: Addison-Wesley. Revised edition (1993) with Foreword by S. Keller, Cambridge, MA: MIT Press.
Hogarth, S.H. (1926) "Three great mistakes," *Blue Bell,* November.
Innis, H. (1950) *Empire and Communications,* Toronto: University of Toronto Press.
——(1951) *The Bias of Communication,* Toronto: University of Toronto Press.
Josephson, M. (1959) *Edison,* NewYork: McGraw-Hill.
Keepnews, P. (1976) "The latest do-it-yourself fetish: computers," *NewYork Post,* 9 June: 47.
Kelly, P. (1997a) "Evolutionary epistemology and media evolution," *journal of Social and Evolutionary Systems,* 20, 3:233–52.
——(1997b) "Self-organization in media evolution: A theoretical prelude to the Internet," M.A. thesis, The New School for Social Research.
——(1997c) Unpublished Letter to the Editor of *The New York Times* about M. Edmundson (1997), 5 November.
Leave it to Beaver (1997) Motion picture directed by Andy Cadiff.
Lehmann-Haupt, C. (1989) Review of *Marshall McLuhan: The Medium and the Messenger* by P. Marchand, *The NewYork Times,* 20 March: C17.

Levinson, P. (1976) "'Hot' and 'cool' redefined for interactive media," *Media Ecology Review,* 4, 3:9–11.
——(1977a) Preface to M.McLuhan (1977a).
——(1977b) "Toy, mirror, and art: The metamorphosis of technological culture," *et cetera,* 34, 2:151–67. Reprinted in L.Hickman and A.al-Hibri (eds.) *Technology and Human Affairs,* St. Louis, MO: C.V.Mosby, 1981. Reprinted in L.Hickman (ed.) *Philosophy, Technology, and Human Affairs,* College Station, TX: Ibis, 1985. Reprinted in L. Hickman (ed.) *Technohgy as a Human Affair,* NewYork: McGraw-Hill, 1990. Reprinted in P.Levinson (1995b).
——(1978a) "The future of technology," Seminar with Marshall McLuhan, Centre for Culture & Technology, University of Toronto, 10 November.
——(1978b) "Tetradic wheels of evolution," Paper presented at Tetrad Conference (1978).
——(1979a) "Human replay: A theory of the evolution of media," Ph.D. diss., NewYork University.
——(1979b) Review of *Culture as Polyphony* by J.Curtis, *Technology and Culture,* 20, 4: 835–7.
——(1980) "Benefits of watching television," *ERIC* microfiche, #ED 233404.
——(1981a) "McLuhan and rationality," *Journal of Communication*, 31, 3:179–88.
——(1981b) "McLuhan's contribution in an evolutionary context," *Educational Technology,* 22, 1:39–46.
——(1981c) "McLuhan's misunderstood message," Letter to the Editor, *The NewYork Times,* 24 February: A18.
——(1981d) "Media evolution and the primacy of speech," *ERIC* microfiche, #ED 235510.
——(1981e) Personal correspondence to Loretta Barrett, Doubleday editor, about publication of *Laws of Media,* 7 January. (1982) "What technology can teach philosophy," in P. Levinson (ed.) (1982).
——(1984) "The New School online," unpublished report prepared for The New School for Social Research, December. Excerpted as "Basics of computer conferencing, and thoughts on its applicability to education," in P. Levinson (1995b).
——(1985) "Impact of personal information technologies on American education, interpersonal relationships, and business, 1985–2010," report prepared for the U.S. Army Research Institute, February. Reprinted in P. Levinson (1995b).
——(1986) "Marshall McLuhan and computer conferencing," *IEEE Transactions of Professional Communications,* March: 9–11. Reprinted in P. Levinson (1995b).
——(1988a) Letter to the Editor, *Saturday Night,* August: 6.
——(1988b) *Mind at Large: Knowing in the Technological Age,* Greenwich, CT: JAI Press.
——(1989) "Intelligent writing: The electronic liberation of text," *Technology in Society,* 11, 3:387–400. Reprinted in M.Fraase, *Hypermedia Volume Two,* Chicago, IL: Scott, Foresman, 1990. Reprinted in P. Levinson (1995b).
——(1990) "McLuhan's space," Essay/Review of *Marshall McLuhan: The Medium and the Messenger* by P.Marchand; *Laws of Media* by M.McLuhan and E.McLuhan; *The Global Village* by M.McLuhan and B.R.Powers; and *Letters of Marshall McLuhan* selected and edited by M.Molinaro, C.McLuhan, and W.Toye, *Journal of Communication,* 40, 2: 169–73.

——(1992) *Electronic Chronicles: Columns of the Changes in our Time,* San Francisco, CA: Anamnesis Press.
——(1993) Review of *Marshall McLuhan: The Medium and the Messenger* by P.Marchand; *Laws of Media* by M.McLuhan and E.McLuhan; *The Global Village* by M.McLuhan and B.R.Powers; and *Letters of Marshall McLuhan* selected and edited by M.Molinaro, C. McLuhan, and W.Toye, *WIRED,* July-August: 104–5.
——(1994a) "Burning down the house," *WIRED,* March: 76.
——(1994b) "Telnet to the future?" *WIRED,* July: 74.
——(1995a) "The chronology protection case," *Analog: Science Fiction and Fact,* September: 100–18. Reprinted in C.G. Waugh and M.Greenberg (eds.) *Supernatural Sleuths,* New York: ROC Books, 1996. Reprinted in *Infinite Edge,* June, 1997. Reprinted in J.Dann (ed.) *Nebula Awards 32: SFWA's Choices for the Best Science Fiction and Fantasy of the Year,* NewYork: Harcourt Brace, 1998.
——(1995b) *Learning Cyberspace: Essays on the Evolution of Media and the New Education,* San Francisco, CA: Anamnesis Press.
——(1995c) "Web of weeds," *WIRED,* November: 136.
——(1997a) "Learning unbound: Online education and the mind's academy," *Analog: Science Fiction and Fact,* March: 48–57.
——(1997b) *The Soft Edge: A Natural History and Future of the Information Revolution,* London and NewYork: Routledge.
——(1998a) "The book on the book," *Analog: Science Fiction and Fact,* June: 24–31.
——(1998b) "Leave Microsoft alone," *The Industry Standard,* 8 June: 36.
——(1998c) "Way cool text through light hot wires," Paper presented at Symposium on Marshall McLuhan (1998).
Levinson, P. and Schmidt, S. (forthcoming) "From gatekeeper to matchmaker: The shape of publishing to come."
Levinson, P. (ed.) (1982) *In Pursuit of Truth: Essays on the Philosophy of Karl Popper,* Atlantic Highlands, NJ: Humanities Press.
Lippmann, W. (1927) *The Phantom Public,* NewYork: Macmillan.
Lohr, S. (1998a) "Microsoft fight will be waged on wide front," *The NewYork Times,* 20 May: A1, D4.
——(1998b) "Software and hardball: Potential grip of Microsoft, via Internet, on many industries is at center of dispute," *The NewYork Times,* 14 May: Al, D3.
MacDonald, D. (1967) "He has looted all culture…," in G.E. Stearn (ed.), 1967.
Marchand, P. (1989) *Marshall McLuhan: The Medium and the Messenger,* NewYork: Ticknor & Fields.
McGrath, C. (1997) "Giving Saturday morning some slack," *The NewYork Times Magazine,* 9 November, sec. 6: 52.
McLuhan, M. (1951) *The Mechanical Bride: Folklore of Industrial Man,* NewYork: Vanguard.
——(1960) "Report on project in understanding new media", typescript published by the National Association of Educational Broadcasters, US Department of Health, Education, and Welfare, Washington, DC, 30 June.
——0(1962) *The Gutenberg Galaxy,* NewYork: Mentor.
——(1964) *Understanding Media,* NewYork: Mentor. Reprint edition (1994), with an Introduction by L.Lapham, Cambridge, MA: MIT Press.
——(1967a) "Casting my perils before swains," Preface to G.E.Stearn (ed.), 1967.
——(1967b) *Verbi-Voco-Visual Explorations,* NewYork: Something Else Press.

——(1969) "Playboy interview: Marshall McLuhan—a candid conversation with the high priest of popcult and metaphysician of media," *Playboy,* March: 53–74, 158.
——(1970) *Culture is Our Business,* NewYork: Ballantine.
——(1975) "McLuhan's laws of the media," *Technology and Culture,* January: 74–8.
——(1976) "Inside on the outside, or the spaced-out American," *Journal of Communication,* 26, 4:46–53.
——(1977a) "The laws of the media," with a Preface by P.Levinson, *et cetera,* 34, 2: 173–9.
——(1977b) Personal correspondence to Paul Levinson, 8 September.
——(1978) "A last look at the tube," *NewYork,* 3 April: 45.
McLuhan, M. and Fiore, Q. (1967) *The Medium is the Massage: An Inventory of Effects,* New York: Bantam.
————(1968) *War and Peace in the Global Village,* NewYork: Bantam.
McLuhan, M. and Hutchon, K. and McLuhan, E. (1977) *City as Classroom,* Agincourt, Ontario: Book Society of Canada.
McLuhan, M. and McLuhan, E. (1988) *Laws of Media: The New Science,* Toronto: University of Toronto Press.
McLuhan, M. and Nevitt, B. (1972) *Take Today: The Executive as Dropout,* New York: Harcourt Brace Jovanovich.
McLuhan, M. and Parker, H. (1968) *Through the Vanishing Point: Space in Poetry and Painting,* NewYork: Harper & Row.
————(1969) *Counterblast,* NewYork: Harcourt, Brace & World.
McLuhan, M. and Powers, B.R. (1989) *The Global Village,* NewYork: Oxford University Press.
McLuhan, M. and Watson, W. (1970) *From Cliché to Archetype ,* NewYork: Viking.
McNeill, W. (1982) *The Pursuit of Power,* Chicago, IL: University of Chicago Press.
McWilliams, P.A. (1982) *The Personal Computer Book,* Los Angeles: Prelude.
Medium Cool (1969) Motion picture directed by Haskell Wexler.
Meyrowitz, J. (1977) "The rise of 'middle region' politics," *et cetera,* 34, 2:133–44.
——(1985) *No Sense of Place,* NewYork: Oxford University Press.
Miller, J. (1971) *Marshall McLuhan,* NewYork: Viking.
Mission Impossible (1996) Motion picture directed by Brian de Palma.
Molinaro, M., McLuhan, C. and Toye, W. (eds.) (1987) *Letters of Marshall McLuhan,* Toronto: Oxford University Press.
Morrow, J. (1980) "Recovering from McLuhan" *AFI Education Newsletter,* 3:1–2.
Mortimer, J. (1988) "Tedium is the message," Review of *Letters of Marshall McLuhan,* selected and edited by M.Molinaro, C.McLuhan and W.Toye, *The Sunday Times* (London), 13 March: G1.
MSNBC-TV (1997) *Time and Again,* Rebroadcast of Frank McGee's commentary on Khrushchev—Nixon "Kitchen" debates, originally broadcast 24 July 1959, rebroadcast 24 July 1997.
Nee, E. (1998) "Surf's up," *Forbes*, 27 July: 106–13.
Nelson, T. (1980/1990) *Literary Machines,* Sausalito, CA: Mindful Press.
Office of the Independent Counsel (1998) "Referral to the United States House of Representatives,"9 September.
Orwell, G. (1948/1949) *1984,* NewYork: Harcourt Brace.
Perkinson, H. (1982) "Education and learning from our mistakes," in P. Levinson (ed.) (1982).

Peterson, I. (1998) "Rethinking ink," *Science News,* 20 June: 396–7.
Plato. *Phaedrus,* in B. Jowett (trans.) (n.d.) *The Dialogues of Plato,* New York: Scribner, Armstrong.
Popper, K.R. (1945) *The Open Society and its Enemies,* London: George Routledge & Sons.
——(1957) *The Poverty of Historicism,* London: Routledge & Kegan Paul.
——(1972) *Objective Knowledge: An Evolutionary Approach,* London: Oxford.
——(1974) "Autobiography," in P. Schilpp (ed.) *The Philosophy of Karl Popper,* La Salle, IL: Open Court.
Postman, N. (1985) *Amusing Ourselves to Death,* NewYork: Viking.
——(1992) Technopoly: *The Surrender of our Culture to Technology,* NewYork: Knopf.
——(1994) "John Culkin Memorial Talk," New School for Social Research, NewYork City, 16 February.
——(1998) "Six questions about media," Paper presented at Symposium on Marshall McLuhan (1998).
Pulp Fiction (1994) Motion picture directed by Quentin Tarantino.
Reservoir Dogs (1992) Motion picture directed by Quentin Tarantino.
Rheingold, H. (1993) *The Virtual Community,* Reading, MA: Addison-Wesley.
Richards, I.A. (1929) *Practical Criticism,* London: K. Paul, Trench, Trubner.
Rosenthal, R. (ed.) (1968) *McLuhan: Pro and Con,* Baltimore: Penguin.
Sawyer, R. (1990/1996) "WordStar: A writer's word processor," available on http://www.sfwriter.com/wordstar.htm.
Schmidt, S. (1989) "Pure art and electronics," *Analog: Science Fiction and Science Fact,* September: 4–12.
Schreiber, F. (1953) "The battle against print," *The Freeman,* 20 April.
Schwartz, T. (1973) *The Responsive Chord,* Garden City, NY: Anchor/Doubleday.
Shannon, C. and Weaver, W. (1949) *The Mathematical Theory of Communication,* Urbana, IL: University of Illinois Press.
Skagestad, P. (1993) "Thinking with machines: Intelligence augmentation, evolutionary epistemology, and semiotic," *Journal of Social and Evolutionary Systems,* 16,2: 157–80.
——(1996) "The mind's machines: the Turing machine, the Memex, and the personal computer," *Semiotica,* 111, 3/4: 217–43.
Sokolov, R. (1979) Review of *The Printing Press as an Agent of Change* by E.L. Eisenstein, *The NewYork Times Book Review,* 25 March: 16.
Specter, M. (1998) "Europe, bucking trend in U.S., blocks genetically altered food," *The NewYork Times,* 20 July: Al, 8.
Starship Troopers (1997) Motion picture directed by Paul Verhoeven.
Stearn, G.E. (ed.) (1967) *McLuhan: Hot & Cool,* NewYork: Dial.
Stevens, H. (1987) "Electronic organization and expert networks: beyond electronic mail and computer conferencing," in *Proceedings of IEEE Conference on Management and Tech nology: Management of Evolving Systems,* NewYork: Institute of Electrical and Electronics Engineers.
Strate, L. and Wachtel, E. (eds.) (forthcoming) *The Legacy of McLuhan,* NewYork: Fordham University Press.
Symposium on Marshall McLuhan (1998) Fordham University, New York City, 27–8 March.

Tedford, T.L. (1985) *Freedom of Speech in the United States,* NewYork: Random House.

Tetrad Conference with Marshall McLuhan (1978) Fairleigh Dickinson University, Teaneck/Hackensack, New Jersey, 10 March.

Theall, D. (1971) *The Medium is the Rear-View Mirror: Understanding McLuhan,* Montreal: McGill-Queens University Press.

Theremin: An Electronic Odyssey (1995) Motion picture (documentary) directed by Steven M. Martin.

Tipler, F. (1994) *The Physics of Immortality,* NewYork: Doubleday.

Titanic (1997) Motion picture directed by James Cameron.

Titanic: Secrets Revealed (1998) Television documentary, produced by Tribune Entertainment, broadcast on WPIX-TV (NewYork City), 25 June.

Turoff, M. (1985) "Information and value: the internal information marketplace," *Journal of Technological Forecasting and Social Change,* July, 27, 4:257–373.

Vacco, D. (1998) Comments on CNN (Cable News Network) TV, 19 May.

van Gelder, L. (1985) "The strange case of the electronic lover," *Ms.,* October: 94ff.

Wachtel, E. (1977/1978) "The influence of the window on Western art and vision," *The Structurist,* 17/18: 4–10.

——(1997) "McLuhan for beginners," comment entered on the Media Ecology listserv on the Internet, 3 November.

Will, G. (1998) Review of *The Last Patrician: Bobby Kennedy and the End of American Aristocracy* by M.K. Beran, *The NewYork Times Book Review,* 24 May: 5–6.

Winner, L. (1977) *Autonomous Technology,* Cambridge, MA: MIT Press.

Wolfe, T. (1965/1967) "What if he is right?" in G.E. Stearn (ed.) (1967).

Wolff, M. (1998) "Louis the un-Wired," *The Industry Standard,* 18 May: 10.

Wynn, M. (1977) *The Plug-In Drug,* NewYork: Viking.