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One rhizome, two unstoppable blossoms: environmental communication and ecological rhetoric

Kevin James Ells
Louisiana State University and Agricultural and Mechanical College, ells@lsu.edu

ONE RHIZOME, TWO UNSTOPPABLE BLOSSOMS:
ENVIRONMENTAL COMMUNICATION AND ECOLOGICAL RHETORIC

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Kevin Ells
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Master in Environmental Studies, York University, 1995
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The prospect of tackling a subject that is "far too vast" to be assessed by any present or future assemblage is apt to daunt even the most audacious individual. If it is too vast to be handled by any single scholar, however, it is, by the same token, also too vast to be avoided by any single scholar.

---Elizabeth Eisenstein (1979, 42)

For Ginger, with love

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I thank my parents, James and Janet Ells, and my sister Karen. Mom taught me to read when I was a toddler and oversaw a happy home; Dad supported our family through long eastern Canadian winters not only 9 to 5 but in volunteering with any extra-curricular activity we took up; and Karen, working steadily all the way through graduate school without ever forgetting how to balance work and fun, more perhaps than she realizes even today, was the smart one. No one ever doubted I could write, nor that I would excel once I settled down and found something I could do competently.

The "LSU Mafia," Shaun Treat, Jon Croghan, and Dan Grano, invited me to participate on a conference panel on my second day of class, praised my learning curve in flag football, and made me feel at home Monday through Friday in Baton Rouge, 115 miles away from my family in Alexandria. Gretchen, Roger, Jess, Tammy, David, and Linda all reassured me in various ways despite their advanced youth and in many ways superior abilities that I had not only been smart to take a 70% salary cut in early middle age to return to school, but had done so in the exact right year.

Throughout I knew by phone or email that my American and Canadian roots were rooting for me: the Hennigars, Tregunnos, Moores, and Ponikvars of Nova Scotia, the Edwardses of Shreveport, the Kartusches of Ontario, the Joneses of Missouri, the Lytles of Louisiana, and the Ellses of Halifax. Together with recent discoveries as a scholar have been many as uncle (to my sister's children, Matthew and Kate), and Bumpa (to my stepchildren's children: Lisa's Sophia and Zach's Aiden and Bella).

My PhD examination committee, Joshua Gunn, Laura Sells, Miles Richardson, and Andrew King, did not so much set the bar high for me (though they did) as light a

TABLE OF CONTENTS

ABSTRACT

This dissertation will contribute to the project of explaining what environmental communication studies may offer theoretically to an understanding of communication and rhetoric in general, investigate a complex problem in rhetoric from a variety of methodological approaches, offer examples of rhetorical criticism relevant to environmental communication researchers, and delve into certain salient aspects of ecological rhetoric (defined herein as *rhetoric from an ecological perspective*). The hypothesis of this doctoral thesis is twofold: 1) studying environmental communication can illuminate much about communication and rhetoric in general, and 2) ecological rhetoric has considerable persuasive potential in itself for reasons that can be demonstrated through criticism and ascertained through theoretical reflection. This dissertation is a critical and conceptual project that might also shed light on some practical questions about environmental advocacy. Case studies in historically significant instances of environmental communication from Garrett Hardin and Al Gore, as well as reflections upon the Interstate and the erosion of the Louisiana coastline, analyzed by means of rhetorical criticism, media ecology, semiotics, and quantitative methods, should highlight the narrative, material, and indexical quality of ecological rhetoric. Finally, a survey of concepts from network science will connect ecological rhetoric with recent debates in rhetorical theory.

CHAPTER 1

ONE ROOT; TWO TREES:
ENVIRONMENTAL COMMUNICATION AND ECOLOGICAL RHETORIC

The Earth is news again, now celebrated and discussed months before and beyond

its designated Day (April 22), a credible contender for top billing on the public agenda

alongside "the economy" and "homeland security." Momentary President-elect Al Gore

is the latest to demolish Fitzgerald's bromide about second acts in American lives as the

star of *An Inconvenient Truth,* still in theatres and nominated for an Academy Award

(which it would soon receive) for best documentary feature a week or so before the

moment – 9:30 AM Central European Time, Friday, 2 February 2007 – that the

Intergovernmental Panel on Climate Change (IPCC) unanimously and publicly linked,

with ninety percent certainty, "the increase of average global temperatures since the mid-

20th century to the increase of manmade greenhouse gases in the atmosphere" (CNN

2007). By springtime, a British CNN reporter could confidently assert that "The reality of

climate change, and mankind's causal role in the process, are facts that are now almost

universally accepted," with the caveat that "while most people have read of the threat of

rising sea levels and melting polar caps, or experienced a nagging guilt when booking a

cheap flight or buying exotic fruit imported from the other side of the planet, hitherto

global warming has largely been something we are happy to leave to the scientists to

worry about" (Hooper 2007). By fall, Gore and the IPCC were jointly awarded the Nobel

Peace Prize.

So if these be bad times for the environment, they are not so for environmental

communication scholars. As a subfield of the unwieldy family compact of rhetorical

criticism, social science research, and performance studies comprising American

Communication Studies (originally Speech, and later Speech Communication), Environmental Communication is rapidly expanding and consolidating, as is its English Literature cousin, Ecocriticism. Attendance at the Environmental Communication Division business meeting at the National Communication Association convention has at least tripled in recent years, and a peer-reviewed journal, *Environmental Communication: A Journal of Nature and Culture,* successor to the third volume of the *Environmental Communication Yearbook,* was launched in early 2007.

Its inaugural editor, Stephen DePoe, is far from the first or only one to call for an examination of what theoretical perspectives environmental communication might entail or even offer to rhetorical theory itself. This doctoral thesis, or dissertation, is my initial effort at contributing to that project. I will explore the concept of **ecological rhetoric**, which is to say, *rhetoric from an ecological perspective,* in order to derive a few of its general principles, and discuss how the study of environmental communication may enrich an understanding of rhetoric and communication in general.

<div align="center">DEFINITIONS AND DISTINCTIONS</div>

If the environment is Nature, and Spinoza identified Nature and God, defining the latter as substance with infinite attributes, then "protecting the environment" is, to put it mildly, something of a floating signifier. So let us sort out our terms at the outset. We are concerned here with **ecological rhetoric**, a term used by a few in the sense by which most intend "environmental rhetoric," itself an area of study in the field of **Environmental Communication**, which encompasses the study or performance of all discourse pertaining to the history, present condition, and plausible future of the **biosphere**, the solid, liquid, and gaseous shell of Earth wherein all living beings interact

with minerals, waters, atmospheres, and one another – in short, what is generally called **the environment**. Environmental Communication researchers examine the practice and critique of such discourse in all media for all potential purposes.

The environment is often casually conflated with **nature**, (capitalized by some as Nature) which comprises the entire material world, or in earlier language, everything under God (or for Spinoza, within God, or a Buddhist, everything). Now, every star and planet is indisputably part of nature in this sense, but only in the most literal and hardly pragmatic sense is the cosmos beyond the biosphere part of "the environment."[1]

That humanity is fully embedded in nature rings true for many people today, even though most of the Western philosophical tradition (not to mention the religious one) stands against this idea, perceiving humanity (formerly Man, and usually thereby *men*) to stand apart from or in a privileged relationship with nature by dint of its/his power of rational thought. As discourse about the nature which environs us, that is, the biosphere, environmental communication studies encompass natural history, nature writing, environmental thought, environmental rhetoric, and ecocriticism – all of which may intersect with ecological rhetoric, the subject of this dissertation.

Natural history, written accounts of human observations of the habits, cycles, and seasons of the non-human world, began with the early Hellenistic polymath Aristotle and the Roman Empire writer Pliny the Elder, whose works remained authoritative, if only spottily accurate, for centuries (Scheese 1996). After eras of silence, natural history resumed afresh in modern times with the influential and popular writings of Gilbert White, William Bartram, and Charles Darwin. Out of this background emerged Ralph

Waldo Emerson and Henry David Thoreau, "the authors most responsible for the transformation of natural history into nature writing" (Scheese 1996, 22).

Authors of **nature writing** intend to bring the essence or feeling-tone of the nonhuman world home to the literate human reader. The earliest nature writing appears about a century after Aristotle in the bucolic poetry of the Hellenistic poet Theocritus, whose work inspired the pastoral poetry of the Roman poet Virgil. We may think of the **pastoral**, in short, as *nature acting civilized*, in a literary (though occasionally realized) zone of peace and comfort between the human realm of politics and the inhuman realm of the wild. In American thought and culture, the pastoral has been found in the rural realm, not the urban nor wild ones.[2] Nature writing that systematically explores philosophical or religious perspectives on the relationship between humanity and nature is often classified as a work of **environmental thought**, or environmental philosophy (sometimes *ecophilosophy*), a field of inquiry in its own right.

Though an author's goal in nature writing may be chiefly aesthetic, nature writing often incarnates its author's rhetorical impulse to modify the reader's perception of nature such that s/he act in a particular manner in the political realm in defense of the pastoral or even the wild. Explicit calls for environmental or wilderness conservation or preservation (as well as counterarguments that such precautions are unwarranted) fall into the category of **environmental rhetoric**, which encompasses all discourse intended to modify human belief or action with respect to the biosphere. Environmental rhetoric as an academic research interest pertains to the explication and criticism of such discourse.

Ecocriticism, a fledgling but burgeoning branch of literary criticism in the U.S., and a new facet of cultural studies in the U.K. (Garrard 2004), is more theoretical in

approach, but in attempting to critique "the mutual construction of culture and nature" (Bennett and Teague 1999), including discussions of cultural representations of nature, has a self-proclaimed political intent identical to that of environmental advocacy, and thereby, most environmental rhetoric (Glotfelty 1996).

Though *ecological rhetoric* seems synonymous for some with environmental rhetoric or even environmental communication, I will consider it in this dissertation as *rhetoric grounded in an ecological perspective*, not just that "everything in the environment is connected to everything else" (Commoner 1971, 23), but that everything (rocks, air, water, politics, bodies, thought, argument) consists fundamentally of the same substance. Ecological rhetoric would not therefore seek to move an audience through appeals to transcendent values with respect to something separate from itself called Nature, let alone to some supernatural force outside or above that, but begin with the knowledge that audience and speaker already participate in a network of forces and entities the deeper understanding of which will benefit the whole.

LITERATURE REVIEW

A survey of cultural and historical perspectives of nature is essential to any study of environmental communication in general and ecological rhetoric in particular. Glacken (1967) traces the development of the idea of wilderness in the Western tradition from prehistoric times to the 18th century. Worster (1977) takes up where Glacken left off, but with a history of the science of ecology, paying special attention to the work of White, Linnaeus, Humboldt, Darwin, Emerson, Thoreau, Muir, Pinchot, and Leopold. Nash (1982) tracks the often conflicted perspectives of wilderness throughout American history. More specifically, Smith (1950) studies 18th and 19th century East Coast and

Southern U.S. perspectives on the West, while Leo Marx in *The Machine in the Garden* (1964) explores the American idea of the pastoral in its sentimental and complex forms, together with the influence of technology on each. Oelschlaeger (1991) surveys Glacken's and Nash's time frames, reassessing the work of Thoreau, Muir, and Leopold, and bringing his analysis to bear on the deep ecology and postmodern perspectives influential in the 1980s. The gamut of perspectives is vast, however, whether one surveys writers from the U.S., Canada (Cayley, 1991; Mowat 1990), the U.K. (Dobson 1990; Garrard 2004), or post-colonial cultures (Guha and Martinez-Alier 1997). Critiques of the representation of nature in popular culture and marketing may be found in Meister and Japp (2002), Cronon (1996), and Canadian recent research by Mark Meisner.

Having grappled with the complexity of the term "environment," one must next examine the range of rhetorical modes and strategies by which people have attempted to communicate about it. American communication research in the area of environmental issues was underway by the early 1980s in both its rhetoric (Oravec 1981/1984) and social science (Grunig 1983) traditions, and in the early work of J. Robert Cox, author of the first college textbook on environmental communication (2006). Killingsworth and Palmer (1992) provided a detailed history and taxonomy of eight rhetorical forms they discerned in American environmental communication (including environmental impact statements, scientific research reports, and science journalism), and placed them along a Perspectives of Nature continuum from the instrumental to the spiritual, concisely diagramming the audiences to which these forms were addressed.

In North America, perspectives on what is variously called nature, the wild, or wilderness have similarly been imagined along a continuum from the anthropocentric to

the biocentric (Payne 1996), and the conservationist (utilitarian) to the preservationist (aesthetic) (Oravec 1984). The pre-World War One dispute between Gifford Pinchot and John Muir, respective founders of the National Forest Service and the Sierra Club, over damming the Hetch Hetchy Valley in Yosemite Park, remains a paradigm example of a conflict exemplified at the farthest possible extremes by the radical Earth First! activists and the Wise Use movement (Payne 1996; Shabecoff 2003), a conflict "not limited to its importance as an acute yet circumscribed conflict over the environment. Rather the debate signaled the defeat of one view of society and the rise of another that has retained its force for much of the twentieth century and still greatly affects our concepts of the 'public' and the 'public interest'" (Oravec 1984, 445).

Though prominent public figures have written and spoken about "the environment" sporadically since Lewis Mumford (1934) and persistently since Rachel Carson (1962), the origin of Environmental Communication as a subfield of Communication Studies is generally considered the publication of Christine Oravec's rhetorical criticism of Muir's rhetoric of preservationism (1981), which showed how early environmental rhetoric met with immense success in the public sphere with lasting historical consequences because of certain rhetorical advantages it possessed. "[Muir] chose to elicit public support . . . using appeals which took the form of literary essays rather than persuasive discourses" Oravec wrote. "[His] ability to convert essentially passive aesthetic response into pragmatic action represents Muir's unique persuasive accomplishment, and as such invites further examination" (246). Though Muir's later writings and negotiations failed to prevent the damming (*damning,* in the pamphleteering of the day) and flooding of Hetch Hetchy, Oravec (1984) demonstrated how Muir's

writing remains a template for environmental advocacy, and showed the potential of environmental rhetoric to articulate non-instrumental yet rational aspirations with which a public can identify. The following chapter 2 arises from the same impetus to explore the implications of a singular rhetorical achievement in a historically influential discourse currently deemed "environmental."

In addition to examining case studies of environmental communication from which to draw pragmatic rhetorical lessons for environmental advocates, and to demonstrating the relevance of particular instances of environmental rhetoric to fields beyond environmental advocacy, scholars of environmental rhetoric in the past quarter century have sometimes pointed out what the distinctive rhetorical challenges of environmental communication can teach about rhetoric in general. Two early examples are Cox's discussion of the "*locus* of the irreparable," the strategic use in public argument of "claims that a decision cannot be repeated or that its consequences may cause an irreparable loss," (1982, 227) due to the unique and precarious position of the subject of the decision at a particular time, and Farrell and Goodnight's (1981) discussion of the failure of technical communication to function competently in the public sphere during the "accidental rhetoric" following the 1979 nuclear reactor malfunction at Three Mile Island.

By the mid-1990s, the authors of two excellent qualitative research reports (Lange 1993; Peterson and Horton 1995) had briefly surveyed the then extant environmental communication research. After citing Cantrill's observation (1993) that few analyses of environmental conflicts had yet appeared in communication journals, the authors of these two reports cited, in addition to one another's work, one book

8

(Killingsworth and Palmer 1992) and twenty-two articles, ten of them in common, for a total of twelve, half of which later appeared in *Landmark Essays In Rhetoric and the Environment* (Waddell 1998). "The year 1996," however, "marked the climax of a tremendous period of growth in environmental communication scholarship," Depoe (1997) wrote in reviewing three anthologies of criticism in the area of environmental politics and rhetoric: *Green Culture* (Herndl and Brown 1996), *The Symbolic Earth,* (Cantrill and Oravec 1996) and *Earthtalk* (Muir and Veenendall 1996). Depoe's outline of the extant literature cited articles by Jonathan Lange and Tarla Rai Peterson as well as seven of the articles these two scholars had identified a few years earlier.

The three 1996 anthologies assembled sets of theoretical essays on, respectively, environmental rhetoric, discourse analysis pertaining to environmental issues, and persuasive strategies in environmental communication. The second half of each anthology consisted of case studies of local and particular instances of environmental communication from which one could draw lessons for future environmental advocacy and sometimes about communication in general. All three books seemed to respond to Rod Hart's (1986) call for, by analogy to law, a "theory of the case," wherein multiple perspectives are brought to bear on a singular rhetorical situation in order to cast light on rhetorical theory in general. In a similar vein, Medhurst (1989) had already cited Oravec's work on the construction of early American conservation movements as a paradigm example.

Yet DePoe had actually understated his case for 1996. That year also saw the publication of Cronon's anthology of critiques of the idea of wilderness, Glotfelty and Fromm's *Ecocriticism Reader,* Macauley's *Minding Nature,* an anthology of essays on

the philosophical roots of modern environmentalism, Don Scheese's treatise on nature writing, Neuzil's and Kovarik's history of environmental conflict as reported in American mass media, and Payne's survey of environmental politics in American life.

Anthologies of articles on Rachel Carson's *Silent Spring* (Waddell 2000), and critiques of the representation of the environment in popular culture (Meister and Japp 2002) soon followed. In general, authors applied established critical perspectives and research methods to the subject of environmental communication, though some articles offered enrichments of rhetorical theory derived from analyses of particular instances of environmental communication or from field research of the practices of people communicating about environmental issues in the public sphere (Lange 1993; Peterson and Horton 1995; Schwarze 2003). Less often, writers drew generalizations from a study of environmental communication with the intention of altering the generally accepted view of rhetoric or communication itself. For example, Schwarze's (2006) discussion of environmental advocates' use of melodrama argues cogently for theorizing melodrama and reversing long established disparagements of it in rhetorical scholarship in favor of a sophistic approach that assesses when the *kairos* lends itself to a melodramatic narrative of advocate versus opposition that is more or less likely to lead to either political entrenchment or cultural transformation.

One of few book-length arguments in this latter vein is DeLuca's *Image Politics* (1999), which argues that the "image events" pioneered by Greenpeace members' anti-whaling performances before what would today be called "embedded journalists" instantiated a rhetorical form not readily explicable by traditional methods of rhetorical criticism. DeLuca reads M.C. McGee's concept of the "ideograph" as synonymous with

the "elements" in Laclau and Mouffe's theory of social change. For DeLuca, image events are a response to the condition of postmodernity, and though they undermine the traditional sender-receiver model of communication, they have politically transformative potential. The contested ideograph of nature, DeLuca concludes optimistically, leaves ample scope for freedom for minority advocates to act in the public sphere.

So environmental communication research has generated to date about the same number of pertinent pages of theoretical reflections upon what such research might bring to the understanding of communication and rhetoric in general as the body of such research itself encompassed circa 1995. There is ample room therefore for further theoretical reflection in this area, especially if such reflection is anchored empirically in the analysis of concrete texts widely regarded as having had a palpable impact in the public sphere in the area of environmental issues. This, then, is the overall project to which this doctoral thesis intends to contribute.

JUSTIFICATION AND RATIONALE

Barry Commoner's commonplace that everything is connected to everything else was a famous instance of environmental communication that also expressed the core assumption of ecological rhetoric. Certainly, much rhetoric makes or purports to make the diametrically contrary assumption. Rhetorical appeals to separation, alienation, division, isolation, and hierarchal classification are legion, especially in recent years. So what happens if we extend the assumptions of environmental communication and ecological rhetoric to communication and rhetoric in general? What distinguishes ecological rhetoric is its drive to make the network of connections among language, thought, world, and audience so palpable an audience may be moved to think or act

11

differently within the web of relationships it comprehends itself to be not apart from, but a part of. So ecological rhetoric, despite its obvious application to environmental advocacy, to the prospect of speaking on behalf of peace on Earth and with it, need not deal with environmental issues at all in every case.

As defined Cox (2006), *environmental communication* is pragmatic and constitutive symbolic action in the public sphere mediating beliefs, attitudes, and behaviors relating to nature and environmental problems. Cox finds most environmental communication research and professional and public practice concerns environmental rhetoric and discourse, media and environmental journalism, public participation in environmental decision making (including collaboration and conflict resolution), environmental advocacy campaigns, risk communication, and representations of nature in popular culture and marketing.

So a given campaign, speech, ad, image event, or argument could exemplify both environmental communication and ecological rhetoric, but not all environmental communication is "ecological," nor is "the environment" necessarily the content of all ecological rhetoric. But ecological rhetoric and most environmental communication share the same underlying assumptions about the material world. One root system, two often intertwined trees.

I am enquiring into the nature of ecological rhetoric because I want to examine its salient aspects in order to find out how environmental communication studies can contribute to a general understanding of communication and rhetoric, and perhaps enhance our understanding of what makes environmental rhetoric effective. The hypothesis of my dissertation is twofold: 1) studying environmental communication can

illuminate much about communication and rhetoric in general, and 2) ecological rhetoric has great persuasive potential in itself. This dissertation as a critical and conceptual project might also shed light on the practice of communication on environmental issues, an obvious application of ecological rhetoric, and some practical questions about environmental advocacy, namely: when does environmental rhetoric achieve its aims, when does it fail to, and when does it merely do what much of it accuses its audience of doing – in essence, burn its own beds? The final outcome of the project of which this doctoral thesis should be an initial contribution is a verifiable or at least plausible theory of ecological rhetoric.

METHODOLOGY

Near the dawn of social science research, one of its early exemplars, Emile Durkheim, felt the need to explain what he recognized as a then unorthodox first step of focusing his statistical inquiry into French and European suicide rates (1897) upon the measurements he would need in order to provide evidence for the results he already expected to find. This is precisely what Durkheim's American contemporary C.S. Peirce first called *abduction*, an innovation in scientific methodology Peirce ranked alongside the ancient deduction and induction. Whereas the classic deductive syllogism proceeds from rule through case to result, and the inductive process assembles cases to observe a result from which a rule is derived, abduction allows the researcher to begin with the prediction of an expected result, and if this result is observed in a particular case, to then postulate a new rule.[3] Today, this is called hypothesis generation, a process that resonates for me with the professorial and collegial advice that a student need not read everything

in the literature (something a dissertation writer never truly believes), but use the literature to help understand what s/he wants to say.

So I begin with the prediction that conceiving rhetoric from an ecological perspective will turn out to be a productive one once my analyses of certain seminal instances of environmental communication uncover ecological rhetoric at work therein. This dissertation will also argue directly and by example for a cluster methodology that takes a series of critical or analytical approaches to a single question, rather than privileging one supposedly best method in advance. This approach assumes the puzzle of ecological rhetoric is larger than a single method can elucidate completely, thus a plurality of methods, a series of approaches, each of which might shed light on the problem from one or another angle. "As with many other interdisciplinary projects such as feminism and cultural studies, no single disciplinary apparatus is adequate to both the range of issues and to a theoretical definition of environmental discourse" (Herndl 1997, 373). This project therefore has two goals:

1. Indicate by example a process of apprehending a large problem in rhetoric by approaching it through a series of methods, rather than a single "best" method

2. Begin to articulate a theory of ecological rhetoric through such a process

I intend to examine in the following chapters several salient aspects of ecological rhetoric, discern when it overlaps with or differs from environmental rhetoric, understand how it relates to rhetoric in general and to environmental communication, and find out what we may learn about ecological rhetoric by examining it from various critical perspectives. In separate chapters, I will analyze instances of influential environmental communication and advocacy from indigenously North American perspectives of

rhetorical criticism, media ecology, semiotics, and the quantitative survey to highlight the narrative, mediated, indexical, and networked aspects of ecological rhetoric. I will examine objectively successful examples of environmental communication or rhetoric, explain at least part of the reason for the success and influence of each, and thereby assemble a set of detailed notes toward a theory of ecological rhetoric. The dissertation as a whole should thereby conclude something of interest about its subject matter, as well as provide an example of one effort to approach a large puzzle in rhetoric by examining it through a successive series of methods. This dissertation should be a starting point in applying a cluster methodology to ecological rhetoric, as well as an example of how such an approach might usefully apply to other book-length puzzles in rhetoric. It should also read as an interesting story in its own right.

STRUCTURE AND PREVIEW

This dissertation will unfold as something of a dialectical narrative. The dialectic will become apparent as each chapter approaches ecological rhetoric from a particular methodological perspective that should prove useful but incomplete, with a specific area uncovered or question unanswered by that method addressed by the use of another method in the following chapter. The narrative arc will reveal, chapter by chapter, salient aspects of ecological rhetoric, while surveying the scope of North American communication theory.

We begin with public address criticism, still in the mainstream of American rhetorical studies, derived from the rhetorical theory of Aristotle and sister to contemporary argumentation theory. **Chapter 2**, the triple-A chapter (America, Aristotle, Argument), will examine an exception to Kevin DeLuca's assertion that "there are no

famous environmental speakers and no memorable environmental speeches" (DeLuca 2001, 17), Garrett Hardin's forty-year-old speech/article on overpopulation. Through an approach to rhetorical criticism drawing upon Aristotelian argumentation theory (though not through what has frequently been called a neo-Aristotelian method), we will explain the enduring significance of Hardin's "The Tragedy of the Commons," its relationship to the work of Hardin's famous contemporaries Rachel Carson and Paul R. Ehrlich, and its current relevance to ecological rhetoric.

Most successful environmental communication of the post-Carson/Hardin generations (the Greenpeace to Gore generation), however, has been mediated electronically to multiple audiences from disparate or corporate authors of messages, so we turn in **Chapter 3** to the more sociological and critical approach to communication theory commonly called "media ecology" in the U.S. but as much in the mainstream of Communication Studies, or Communication[s], in Canada, Australia, France, and the U.K. as are social science research methods in American communication research. We will start by demonstrating the practical use of classifying all communications media as records, channels, or environments, and then introduce media ecology, a critical tradition in media studies that conceives of media as environments (and environments as media). We will explore the roots of media ecology and contrast it with other useful approaches to media studies. After noting how media ecology might serve as something of a bridge between the traditionalist and critical/cultural strands of U.S. rhetorical studies, we will, partially by way of the work of Ivan Illich, extend rhetorical criticism somewhat by applying the media ecology perspective to an analysis of what would strike a traditional

rhetorical scholar as a peculiar selection of text, the U.S. Interstate. In concluding, we will discuss the essentially material nature of ecological rhetoric.

Yet if nature is, in Cox's elegant phrase, "ethically and politically silent" (2006, 17), what are we doing when we foretell the future of our nonhuman environment or explicate the cultural significance of our all-too-human physical or electronic built environments? **Chapter 4** will answer that question by drawing upon semiotics in order to elucidate the indexical character of ecological rhetoric. Starting with last century's first popular writer on semiotics, Roland Barthes, we will show his method as structurally identical to the one used by all people everywhere in their prehistoric environments, or for short, "nature." To do this, we will review the two most widely known paradigms of semiotics, and will prefer to that of Barthes's compatriot F. de Saussure the American semiotics of C.S. Peirce. Finally we will apply Peircean semiotic analysis to the most celebrated instance of environmental communication in the public sphere of the past decade or so, Davis Guggenheim's documentary of former Vice-President Gore's public lecture on global warming, *An Inconvenient Truth.* This will allow us in conclusion to distinguish ecological rhetoric from other approaches to environmental communication on the basis of its preference for the index, or indicator, over the icon or symbol.

Next, we will take a step back to see if some of the foregoing discussion might be anchored more precisely through quantitative research. The final outcome of the project of which this essay should be an initial contribution is a verifiable theory of ecological rhetoric. In **Chapter 5** we turn from criticism and speculation to measurement, and apply established methods of quantitative research to a small instance of ecological rhetoric used in a 2004 survey of Louisiana university students' attitudes toward seeking further

information about Louisiana's receding coastline. The results of attitude change in a large sample of a population for whom the state of the Louisiana coastline is relevant should indicate how information about one particular environmental issue presented in straightforward technical prose compares with a narrative incorporating much of the aspects of ecological rhetoric discussed in chapters 2 through 4, such as thought experiment, vicarious narrative, and a materialistic, indexical analogy.

Finally, in **Chapter 6**, we will ask why, if we live in a condition of postmodernity, so much of our world still feels so modern, or makes sense once it is examined with care, and why aspects of methods rooted in antiquity sometimes still ring true. Our answer will derive from the so-called "new science of networks," (Barabási 2003, 8)*,* and here is where we might strike out in a new direction. After surveying the findings and import of a field that has already contributed several terms to popular culture (such as "tipping point" and "six degrees of separation"), we will suggest, with reference to clear concepts in networking, how postmodern thought might best apprehend distributed networks (like the Interstate or "smart mobs"), while the desire to appeal to the most richly-connected nodes, people, or groups in a decentralized network (like the Internet and most social networks), might leave a 21st century door open for a version of old-school rhetorical studies. Network science will connect our discussion with recent developments in several of the physical and human sciences that relate at least metaphorically to the standpoint of ecological rhetoric, rhetoric grounded in an ecological perspective. A brief conclusion comprising **Chapter 7** will consider short-term and long-term implications of ecological rhetoric for further research in rhetoric and communication studies.

CONCLUSION

My faith that the study and practice of ecological rhetoric is worthwhile derives from the same faith underlain by the act of speech itself. Whenever we choose to speak, or to write, whenever we listen and read to understand, we assert a belief we cannot prove, namely, that a world exists outside our consciousness that remains constant from one utterance to the next. Slavoj Žižek (1991) puts it this way:

> By the mere act of speaking, we *suppose* the existence of the big Other as guarantor of our meaning. Even in the most ascetic analytical philosophy this fundamental belief is maintained in the form of what Donald Davidson called "the principle of charity," conceiving it as the condition for successful communication. The only subject who can successfully renounce the "charity principle" – that is, whose relation to the big Other of the symbolic order is characterized by a fundamental disbelief – is the *psychotic*…. (153, italics in original)

Even René Descartes in his most radical exercise in doubt never went so far as to assert, when speculating "that [God has brought it about that] I am always mistaken when I add two and three or count the sides of a square" (1960, 78)[4] that the concepts of "square", or "three", or "always", or "when", had themselves shifted or altered from one moment to the next, or that "add" could signify different processes from one instant to the next. C.S. Peirce would later assert Descartes was merely performing doubt, and not genuinely experiencing it.

Now, to say that speech implies faith does not mean speaking entails belief in any particular vision of a Christian God, though what speech entails a belief in, exactly, may seem difficult to pin down (*cf.* Žižek's "big Other"). Spinoza, for his part, virtually identified God with Nature (*Deus sive Natura*) after calling God "substance consisting of infinite attributes" (*E* I P11). Hindus seek direct apprehension of Brahman, the ground of

reality itself.[5] However it be expressed, wherever in the world, if one does not believe in this or something like it, speech becomes not just impossibly difficult, but impossible.

One night in late 1988, in a cafe in Montreal, I caught a fleeting glimpse, behind my eyes, of a mad elephant stampeding toward a flaming jungle, and of a flea on its back nibbling furiously away and thinking, "Maybe if I can get its attention, it will listen to my not unreasonable request to change direction." I think I twice accepted fifty-to-seventy percent pay cuts and a poorer debt-equity ratio to learn how to crawl off the beast's back and into its ear and brain.

Ecocriticism was first discussed as such in 1978, when William Rueckert coined the term, though the American Studies pioneer Leo Marx was already writing it by 1964, and both Roorda (1997) and Coupe (2003) argue Kenneth Burke had articulated the perspective by 1937. Further, Seigel (2004) considers the popular ecological literature of the 1930's, written in response to the Dust Bowl, instrumental in the structure of Burke's thought, and suggests that "ecological rhetoric" is directly analogous to what Burke called his "comic frame," and that the comic frame is in essence an ecological one.

> Because it requires one to take into account multiple perspectives on and different contributing factors to a particular situation, rather than "efficiently" committing oneself to one perspective, organizing one's acts according to the standards of ecological balance is similar to organizing them according to the "comic frame" (394). … It requires the critic, or propagandist, or scientist to understand how the different aspects of a given situation relate to one another rather than debunking perspectives until the desired one remains. (398)

This perhaps expresses *in nuce* the ethical stance underlying this study. Not only will this doctoral thesis refuse to privilege one theoretical or critical perspective, but it will admit that not even its quartet of approaches can exhaust all there is to say about its subject. But perhaps we can take a stride in that direction, and leave the way open for

experts in other methods to continue exploring the issue, while creating an example of how to approach other complex and wide-ranging subjects in rhetoric.

NOTES

[1] Walter Ong (2002) writes, "The human environment is of course not just the earth but the entire universe" (6). Of course it is not. The human environment is just the biosphere. To leave Earth requires massive technological intervention even in science fiction, and in reality, getting anywhere interesting having left Earth requires extending the Shannon and Weaver model beyond most senders' or receivers' life spans. A human in one of Earth's fiery or icy deserts can survive with sufficient tools and provisions, and sometimes even make a home there, but a human in space without an expensive suit that impedes most modes of interpersonal communication will expel fluids from every orifice and freeze solid in about a minute. Outside the biosphere, only sun, moon, meteors, and comets can affect us, and we can have no effect on their orbits or vectors. The title of an old Isaac Asimov anthology outlines the scope of this dissertation: *Earth is Room Enough*.

[2] This perfunctory encapsulation captures the everyday use of the term *pastoral*, and corresponds with what Nash (1982) calls the "soft pastoral" in American history and cultural memory. Nash's "hard pastoral" names the idea of the wilderness as a vast nonhuman realm the experience of which lifts a participant in it or even observer of it to a sense of the sublime. In either case, the pastoral is a space beyond the *polis* wherein humans derive spiritual replenishment.

[3] Whether Durkheim knew of Peirce is unknown to me. Durkheim was around twenty years old in 1878 when Peirce lectured in Paris and published French language versions of two of his most subsequently influential essays (Deledalle 2000).

[4] L.J. Lafleur, Descartes's translator herein, has enclosed in brackets a clarification absent in Descartes's 1642 Latin edition of his *Meditations Concerning First Philosophy* but present in the Duc de Luynes' 1647 French translation that Descartes read and approved before its publication (xxi-xxii).

[5] A famous Zen Buddhist *koan* depicts a student asking, "What is Buddha?" and the teacher replying, "This mind is not Buddha." What could this possibly mean? Perhaps that by the time the teacher has spoken, not only the mind that heard the question but also the one that asked it has changed, maybe imperceptibly, but nonetheless changed. Only the present instant exists. The mind moves persistently on, but the reality in which it moves, though infinitely mutable, harmonizes to a consistent ground bass. Of course, don't take my word for it. Be lamps unto yourselves.

CHAPTER 2

WHERE'S YOUR DADDY?
ECOLOGICAL RHETORIC THROUGH RHETORICAL CRITICISM

"One piece of litter won't destroy the planet," your passenger correctly asserts, rolling down your Toyota Prius window to expel an empty soda can into your conception of Nature. Flabbergasted, you engage your passenger in a thought experiment: "What if all six billion people in the world did that?" Your passenger reckons at least a quadrillion cans of soda are consumed every year, and yet the earth abides. You begin to retort, but suddenly find visualizing a quadrillion soda cans fiendishly difficult. Then you recall that "the entire world population could fit into Texas and each person could have an area equal to the floor space of a typical U.S. home. Hell, if people were willing to stand, everyone on earth could fit comfortably into half of Rhode Island" (McKibben 1998, 71). You figure your passenger occupies the space of at least a hundred soda cans, maybe hundreds of compacted ones. Now you're trying to divide the land area of the Earth and the volume of its oceans by half of Rhode Island. Then you remember Garrett Hardin once wrote, "The morality of an act is a function of the state of the system at the time it is performed. Using the commons as a cesspool does not harm the public under frontier conditions, because there is no public; the same behavior in a metropolis is unbearable" (1968, 1245). What if your passenger shed two pieces of trash daily, or hourly? How many such passengers can the carrying capacity of the Earth sustain? Perhaps we might all live more happily and securely with fewer people in the world.

We have now recapitulated the seductive reasoning of Garrett Hardin in his landmark 1968 article, "The Tragedy of the Commons," to be examined in the present chapter less for what it reveals about its subject, overpopulation, than about

environmental communication and rhetoric, as well as what I am calling throughout this dissertation *ecological rhetoric*.

Though American Presidential rhetoric with respect to environmental issues has been carefully explored to date (Peterson 2004), the traditional "one speaker / one speech" mode of American public address criticism might seem at first blush unsuited to the explication of environmental or ecological rhetoric. Before elucidating his cogent mediations on the efficacy of environmental advocates' use of "image events" in the public sphere through media of mass communication, DeLuca noted, "It is significant that there are no famous environmental speakers and no memorable environmental speeches" (1999, 17).[1] Of course, such writers as Aldo Leopold and Rachel Carson spoke from behind many a podium, but one today recalls their books rather than any public address based upon them or predating them. And the article that largely established environmental communication studies in the U.S., Oravec's study (1981) of John Muir, discusses a politically active public figure known chiefly in his lifetime, and remembered today, for his writing.

Garrett Hardin, a professor of human ecology at the University of California at Santa Barbara, composed "The Tragedy of the Commons," perhaps the lone exception to DeLuca's generalization about environmental speeches, as his "first attempt at interdisciplinary analysis" (Hardin 1998, 682), a retiring President's address on 25 June 1968 to the Pacific division of the American Association for the Advancement of Science (AAAS), the publishers of *Science* magazine. Weekly issues of *Science* include news reports, essays, and refereed papers in basic and applied (primarily life) sciences, as well as "articles," written by scientists or science journalists for scientists and the educated

non-specialist. "Trimmed by half" (Hardin 1998, 682), Hardin's address appeared as an article in the 13 December 1968 issue. "*Science* conveys an image of scientific practice and a tone that scientists themselves would likely be most comfortable with" (Killingsworth and Palmer 1992, 140). Hardin's article sustained that tone, but in a lucid, jargon-free style that reads like a transcript of the public lecture it was at first.

Becoming "one of the journal's most requested articles in the subsequent 35 years" (AAAS 2003), it has been reprinted at least 87 times (Carnell 2006). "The article stimulated immense intellectual interest across both the natural and social sciences, extensive debate, and a new interdisciplinary field of study. Scientific interest in the commons grew throughout the 1970s and early 1980s largely in reaction to Hardin's article and the frightening news stories about sharp population declines of many species" (Dietz, *et al.* 2002, 6). In legal scholarship alone, the basic concept of the article "has been used to characterize a scarcity of intellectual property rights, telemarketing, asbestos over-litigation, neglect of Presidential papers, overcrowding of the radio spectrum, overcrowding of the wireless telecommunications spectrum, sidewalk vending, greenhouse gas emissions, water pollution, underground water overdrafting, and ... overfishing" (Hsu 2005, 3).

"The Tragedy of the Commons" is named for the narrative recounted on its second page which extends a hypothetical example from an 1833 lecture by W. F. Lloyd into a thought experiment in which a herdsman in a common pasture precipitates its ruin by pursuing, as do other rational economic agents like himself, his own self-interest. Out of its original context, the story teaches social cooperation for the benefit and future security of all, but Hardin used it as a fable to warn of the long-term consequences of

overpopulation. "Freedom to breed," Hardin concluded, "is intolerable" (1968, 1246), advocating "mutual coercion mutually agreed upon" (1968, 1247) to abate overpopulation.

Concern for environmental issues may arise from virtually any social philosophy or political standpoint. Of all political perspectives, political ecology alone stands outside the drama of the individual versus the state, since the existence of both individual and state derives from the very starting point of environmental policy analysis, the non-human world. "Ecological arguments are never socially neutral any more than socio-political arguments are ecologically neutral" (Harvey 1993, 25). Though rhetorical criticism has dealt at length with Carson (Corbett and Connors 1999; Waddell 2000), and proffered several discussions of Leopold (Ulman 1996; Payne 1996), Hardin, often mentioned in passing, has not yet been examined at length. Perhaps the nature of his rhetorical appeal seems as obvious as the current unpopularity of his politics. In this chapter, we shall see how to retain the former while discarding the latter, and account for Hardin's enduring salience.

One reader of a previous iteration of the following discussion thought it unusual while another thought it neo-Aristotelian -- mutually exclusive adjectives, of course. Aristotelian it is for certain, but not along the lines indicated by Herbert Wichelns in 1925, the elaboration of which throughout mid-20th century American rhetorical studies was so scathingly if rather selectively deconstructed by Wichelns's doctoral student Edwin Black forty years later (Black 1965; King and Kuypers 2001). As for more recent methods in rhetorical criticism, one need not burrow too deep to uncover fantasy themes

in the discourse of a man declaring freedom to breed intolerable, and Hardin is hardly an elusive target for feminist or ideological criticism.

Soroos (1984) recounts a perhaps common experience for readers encountering Hardin for the first time. "The immediate urge is to attack what on the surface appears to be a repugnant and outrageous sense of values," although "the empirical and logical underpinnings are a more promising point of attack" (354). I agree, and with Ceccarelli's suggestion (2001) that "rhetorical critics should choose which aspects of a fairly loose rhetorical lexicon to use to best illuminate a specific text" (325). To that end, I discuss first how Hardin's skillful use of the extended hypothetical example as a vicarious narrative underlies the rhetorical force of "The Tragedy of the Commons." Ross (1998) infers Hardin's political intent from the article's lack of empirical content, but since Hardin clearly intended to forego inductive reasoning in favor of a deductive argument logically entailing his conclusions, I then turn to classical argumentation theory to explicate how Hardin uses his narrative to postulate a particular syllogistic proof, and then applies that proof enthymematically, but inconsistently, to contemporary social conditions.

We begin with an outline of Hardin's life, and the context in which he wrote as a population theorist and environmental writer, and then recount his narrative and examine his argument in detail. In conclusion, I will posit "The Tragedy of the Commons" as an example of ecological rhetoric.

GARRETT HARDIN AND THE "POPULATION PROBLEM"

Garrett Hardin earned his Ph.D. in microbiology at Stanford University and married in 1941 at age 26. He subtitled his 1964 anthology of excerpts and essays on

population by contemporary and historical writers "A Collage of Controversial Readings," and would readily welcome controversy throughout his life.[2] He was far from the first to write about the so-called population problem. T. R. Malthus first elaborated in 1798 how deleterious social consequences would arise inexorably from the concurrence of this pair of postulates: 1) the human need for food and passion for sex is innate and ineradicable; and 2) food supplies increase arithmetically, or in linear fashion, whereas population grows geometrically, or exponentially.

Although Malthus's specific and local predictions proved incorrect, many scholars by the end of World War II were grappling with the implications of what Bouthoul called a new "demographic mutation" arising from a reduction in infant mortality and concomitant advances in medicine and social hygiene. "The true biological mutation undergone by the human species as a whole consists of an *acceleration* in its potential for numerical expansion" (Bouthoul 1964, 12).[3] Malthus redux, perhaps, but inspired by a change in conditions requiring fresh calculations. Earlier, Kingsley Davis had predicted the 1930 world population of two billion would triple by the year 2000, and posed this chain of questions: at what standard of living can six billion live? can the Earth's resources sustain them? how will this population be distributed? and finally, in short, why should we? "What point is there to straining every resource, bending every effort, simply to support ever-greater numbers?" (1951, 21)

Many saw unchecked population growth as a harbinger of doom. C. W. Park called Davis's (as it turned out, accurate) prediction "staggering" and referred to "voices raised in screeching alarm" (1965, 1).[4] If an alarmist, Hardin was the most lucid of them, and the most concise stylist. He did not pioneer the use of the vivid analogy to explain the

27

population problem,[5] but he was original in elaborating an economic analogy into a thought experiment readers would interpret vicariously such that they could conceptually connect their own desires and resultant behavior to the entrenchment of a potentially catastrophic global trend.

"The Tragedy of the Commons" appeared in 1968 at a time of nascent ecological awareness in the United States, but its intellectual heritage predates the modern environmental movement by centuries, as does its emotional heritage. Hardin taps into a Malthusian vein, as he acknowledges (1243), but also into a Hobbesian one. As in Hobbes's *Leviathan*, one finds in Hardin a fear of societal ruin stemming from the self-interested actions of individuals, and an authoritarian political philosophy in response. "We institute and (grumblingly) support taxes and other coercive devices to escape the horror of the commons" (Hardin 1968, 1247). This fear recalls that of the first British colonists to North America writing about the wilderness they encountered. Though many new settlers attested in letters and journals to the hope and wonder of the materially abundant New World, others were overwhelmed and terrified by it: "Behind the trees lurked the Native Americans, ready, the settlers suspected, to commit unspeakable atrocities" (Shabecoff 2003, 10).

Hardin's enemy lurked not in nearby space, but in near future time. In several books, essays, and speeches, Hardin argued not only against overpopulation, but also, and less popularly, immigration, seeing rich countries as lifeboats potentially swamped and sunk by the rapidly breeding members of poor countries. "When we make it possible for another nation to get rid of its excess population by shipping it to us, we merely encourage the leaders of that nation to avoid the hard problem of population control"

(Hardin 1982, 24). Hardin opposed the creation of the World Food Bank, "a commons in disguise," since "the less provident and less able will multiply at the expense of the abler and more provident, bringing eventual ruin upon all who share in the commons" (Hardin 1974, 41). He also opposed international famine relief efforts for Ethiopia, and believed China's one-child policy, enforced only in severely overpopulated areas of China, did not go far enough (Spenser 1992, 60).

Hardin seemed to relish his iconoclastic image, and his vigorous polemical style found staunch admirers. Others had mixed opinions: "As a radical thinker and, fundamentally, a combative moralizer fond of categorical pronouncements, Hardin did not make things easy for his readers. … Only one thing was impossible: to remain indifferent in the face of his impassioned arguments" (Smil 2004, 8). Certainly, no early 21st century American political faction would embrace Hardin wholeheartedly. Though a lifelong Republican, "Hardin and his wife helped run an underground operation that sent 200 women to Mexico for abortions before the procedure was legal in the United States" (AP 2003).

Though he has been plausibly accused of social Darwinism (Fleming 1972, 58) and eugenics (Ross 1998, 76), Hardin is perhaps best remembered as a doctrinaire neo-Malthusian.[6] Still, one can admire Hardin's dogged and unsentimental exposure of long-range ecological and sociological problems and his manner of puncturing comforting euphemisms (he would call a shortage of supply "longage of demand," [1991]). His talent for the pithy and scathing neologism (he called politically irrelevant demographic information "arithmorrhea" [1991]), though not unique (Bouthoul, for example, called the historic cycle of war in Europe "deferred infanticide"),[7] remains rare.

Hardin died in September 2003, in a mutually arranged suicide with his terminally ill wife of sixty-two years, survived by four children.

<center>**"THE TRAGEDY OF THE COMMONS"**</center>

Hardin begins by assigning the "population problem" to the class of "no technical solution problems" (1243), a technical solution arising from a change in technique in the natural sciences while demanding nothing of human values. Recalling Malthus, Hardin notes (1968) that population grows exponentially, and concludes, almost syllogistically, "A finite world can only support a finite population, therefore population growth must eventually equal zero" (1243).[8] Even if energy supplies were infinite, energy cannot be dispersed infinitely in a finite system, so the optimum population will always be less than the maximum. Hardin somehow reads as a counterargument Bentham's moral axiom, "It is the greatest happiness of the greatest number that is the measure of right and wrong" (1962, 227):

> If our goal is to maximize population it is obvious what we must do: We must make the work calories per person approach as close to zero as possible. No gourmet meals, no vacations, no sports, no music, no literature, no art. ... I think that everyone will grant, without argument or proof, that maximizing population does not maximize goods. Bentham's goal is impossible. (Hardin 1968, 1243-4)[9]

So rather than advocating the greatest happiness for the largest extant number of people, Bentham was advocating maximum population growth. Assuming he is not deliberately misreading Bentham, Hardin seems so horrified by the prospect of overpopulation that he finds support for it everywhere.

Hardin then recounts an extended hypothetical example he calls "the tragedy of the commons" that functions as a scientific thought experiment. So frequently paraphrased elsewhere and integral to the article's argument, it merits quoting at length:

<center>30</center>

The tragedy of the commons develops in this way. Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. … As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, "What is the utility to me of adding one more animal to my herd?" This utility has one negative and one positive component. 1) The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1. 2) The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsmen, the negative utility for any particular decision-making herdsman is only a fraction of 1.

Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another. . . . But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit--in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all. (1244, second ellipsis in original)

Hardin's fable relies upon assumptions about economics shared by perhaps its entire intended audience. Among both neo-classical and Marxian economists, as well as non-economists relying on so-called common sense, there is widespread consensus on the basic tenets of economic behavior in what Braudel (1979) called a market economy (studied as such in the subfield of microeconomics and called "the laws of supply and demand" in popular parlance). Hardin deftly demonstrates that in a finite material system, dangerously presumed to require an infinite supply of energy and natural resources, the individual rational actors of neo-classical economics will bring about, in the aggregate, the ruin of all resources held in common. "We can make little progress in working toward optimum population size until we explicitly exorcize the spirit of Adam Smith in the field of practical demography" (Hardin 1968, 1244)

Hardin did concede thirty years after publishing "The Tragedy of the Commons" that he should have specified he was writing about "an unmanaged commons" (1998, 682), a crucial distinction, for it leaves open the political choice of management schemes, and allows for varying responses to local conditions, a flexibility hardly implied by Hardin in 1968. Though Hardin seems at first squarely in the field of ecological economists such as E.F. Schumacher (1973) and Herman E. Daly (1977), whose influential books also asserted that a capitalist economy cannot grow infinitely on a materially finite resource base, and was fond of saying "ecology is the overall science of which economics is a minor specialty" (qtd. in Meile 1996), in 1968, Hardin feared less the danger of unlimited consumption than unlimited reproduction.

HARDIN THE STORYTELLER

The two most significant American books in environmental rhetoric published between Muir's death and Hardin's article were Leopold's *A Sand County Almanac,* published in 1949, and Carson's *Silent Spring,* published in 1962. Leopold's book culminated one era of environmental writing, while Carson's inaugurated a new era. Taken together, they strike me as the two testaments of a modern environmentalist Bible. "*Silent Spring* marks a literary and political dividing line between the conservation era and modern environmentalism" (Payne 1996, 137). Leopold's text shows the reader how to see the world directly and *feel* about it, and thereby how to act for its conservation. Carson educates the reader in how to perceive the world and *think* about it, and how to act for its preservation.[10]

Carson's short chapters, each a self-contained essay in science journalism, sustain a suspenseful narrative leading to a frightening but plausible future. Waddell suggests the

public reception of *Silent Spring* may be explained best by an "overdetermination thesis: that is, that no one factor—either within or outside the text—can adequately explain [its] success" (2000, 11). "Carson tapped into…the public's growing uneasiness over science and the military in the Cold War era" (Killingsworth and Palmer 1996, 27). She wrote about a threat that was potentially pervasive, pathogenic, deadly, and invisible. "Pesticides could be understood as another form of fallout" (Lutts 2000, 19).

Garrett Hardin surely read *Silent Spring* and may well have adapted Carson's use of the illustrative fable to the extended hypothetical example he uses in his article. Perhaps we may read "The Tragedy of the Commons" as inspired in part by Carson's rhetorical success, which was well established by 1968. Like Carson, Hardin also benefited from propitious timing. "The Tragedy of the Commons" arrived at the end of the year Paul Ehrlich published *The Population Bomb* (1968), an immediate mass-market paperback best-seller written with a "dramatic flair and apocalyptic style" (Payne 1989, 63) well-suited to Hardin's cultural context. In 1968, Soviet tanks brought Czechoslovakia's "Prague Spring" to a swift end, and that summer, student demonstrations in Paris came close to inaugurating France's Sixth Republic. The U.S. was deeply entrenched in the Vietnam War, and two of its most popular and influential American public figures, Martin Luther King and Robert Kennedy, had just been assassinated. Two weeks after the publication of Hardin's article, NASA astronauts broadcast a Christmas message from the Earth's orbit. Hardin must have realized he would need to deliver a vividly memorable message to attract attention in this milieu, in which numerous writers and speakers were already expressing themselves in radical, at times apocalyptic, terms, whether about civil rights, ecological disaster, the Vietnam

War, or women's liberation. He must also have perceived an expansion of the public sphere for ideas that diverged from conventional wisdom.

Carson's rhetorical intent is established in a short introductory narrative called "A Fable for Tomorrow," where "it is generally agreed that modern environmentalism begins" (Garrard 2004, 1). It makes use of the science fiction device in which a narrator provides dramatic unity of time and place to the worst historically verifiable case studies pertaining to a particular issue.[11] "It experiments with the merging of genres. It requires readers to view the text simultaneously as a fable, a psychologically complex tragedy (with a flawed protagonist—the community), and a report of actual occurrences" (Killingsworth and Palmer 1996, 30). Though criticized by many scientists, it received a warm welcome from others, and became the book's most memorable chapter (Oravec 2000, 42).

In Carson's fable the flawed community is fatally oblivious to the links between its increase in the number, variety, scope, and severity of its illnesses, and "a white granular power … [that] some weeks before … had fallen like snow upon the roofs and the lawns, the fields and streams" (Carson 1962, 3). In Hardin's thought experiment the rational agent of neo-classical economic theory is the fatally flawed protagonist, blind to how the aggregate of individual desires identical to his leads to the destruction of the ecological and material bases of his economy and society. In Carson, "The people had done it to themselves," (1962, 3) and you, the reader, realize that you are like those people. In Hardin, however, you identify with a sole protagonist, through whom you realize that "you will do it to yourself." Carson says *we* must change, or disaster is probable; Hardin says *you* must change, or disaster is inexorable.

Though Walter Fisher asserted that "narrative as a *mode of discourse* is more universal and probably more efficacious than argument for nontechnical forms of communication" (1984, 14, italics in original) because it simultaneously appeals to the various senses and relies on suggestion and identification rather than inference and deliberation, and because everyone learns from one's culture the rules of narrative rationality (14-5), Warnick (1987) cautions critics to consider Fisher's narrative rationality (something of an amalgam of narrative coherence and informal logic) as "a *system* of critical criteria that may be variously brought into play depending on the nature of the text to be assessed" (181, italics in original). Narration, therefore, is not necessarily more persuasive than argumentation in itself, but only when a compelling and coherent story illustrates a superbly structured argument, be it an inductive argument grounded in copious credible evidence, or, as in the case of "The Tragedy of the Commons," a rigorously crafted deductive argument.

Stories have served a didactic function for millennia. Pre-Socratic Greek pupils recited the poems of Homer to learn how to live in the physical and social world. Stories of heroes to emulate or villains to despise, invented or historical, in public spheres or private, have been told by thousands of people to millions. It is a commonplace that there are only a small number of basic plots available to any storyteller, but surely Hardin's story is one of the oldest and most frequently told: that of a character punished by reality -- Kenneth Burke's "unanswerable opponent" (1941, 113) -- for concentrating too narrowly on his or her own desires. One finds a variant of this plot among the episodes recounted in the epic of Gilgamesh, the myths of Icarus and Oedipus, and the familiar tale with which the Old Testament begins. That the herdsman could bring ruin upon the

commons due to his selfish shortsightedness is, as they say, one of the oldest stories in the book. So much for coherence or narrative probability. Just because a story rings true, however, does not mean it will stand up to careful analysis, as we shall see next.

HARDIN'S THOUGHT EXPERIMENT

Hardin knew his views elicited widespread criticism. Initial responses to his article said he "neatly misses the mark" and critiqued his "insidious arguments" and "one-sided view of human nature" (Lewis, *et al.* 1969, 518). "One of the important contributions of the past 30 years of research" according to Dietz, Dolšak, Ostrom, and Stern (2002, 3), "has been to clarify the concepts involved in the tragedy of the commons. Things are not as simple as they seem in the prototypical model." Let us examine why.

Hardin uses a thought experiment to postulate and prove an implied syllogistic argument, and then applies that proof enthymematically to factual circumstances. This will take a moment to explain in sequence, so let us start by reconstructing in detail the structure of the syllogistic reasoning underlying the Commons fable.

1. If you can imagine yourself doing X, you can imagine everyone doing X

2. In reading a description of a person like you doing X, you imagine yourself doing X

3. You can therefore imagine everyone doing X

X refers to a scenario in which the individual action of one agent, though relatively harmless in itself to the system to which the agent belongs, would contribute to seriously damaging or destroying the system if all similar agents acted in the same way at the same time. Here is the next step:

1. Everyone doing X will bring about Y

2. You can imagine everyone doing X (previously demonstrated)

3. Y will happen

Each reader (or listener to the public address preceding the publication of the article) already accepts that if one desires a thing, one can imagine everyone alive desiring it. A speaker or writer needs only, therefore, to tell a vivid story with a protagonist with whom an audience member can identify. Hardin does not relate a vicarious narrative in the sense of a story told in the second person singular, as in the introduction to this paper, but rather, and far more compellingly, *a hypothetical situation the listener or reader is invited to interpret vicariously*. Once the audience member identifies with the fictional character, he or she understands from his or her own self-concept that the future events implied by the narrative must inexorably occur. Instead of asking an audience to imagine a horrifying future that *might* occur "if this goes on," as Paul Ehrlich (1968) had done earlier in the year Hardin published his article, Hardin makes a future that logically *will* occur a new aspect of the audience's perception of the present. The crux of Hardin's rhetorical accomplishment lies in the way that members of the audience for the story believe the global implications of the story will occur *precisely because they attend to the story and understand it*.

Hardin ponders three possible solutions to the problem of overpopulation. First, he claims that instituting an administrative structure to regulate population begs the ancient question of who watches the watchers, even though this will be the solution he proposes. Second, even Hardin does not suggest that his readers imagine living in a culture where people who had too many children would simply have to let them die. Finally, Hardin suggests an appeal to conscience will fail also in the long-term because

those who fail to inherit conscience genetically or acquire it culturally will eventually take advantage of all who, innately or through learned personal conviction, agree to play by the rules.

To illustrate, assume we live in a society that considers it wrong to steal office supplies from an employer's closet. First, we imagine the possibility that someone could steal supplies. Next, we imagine stealing them ourselves. If we cannot, let us imagine a scenario wherein everyone steals supplies but us. If we cannot imagine stealing supplies even then, imagine those in charge of the supplies have recently been awarded large bonuses in a year when our wages were frozen or reduced due to financial losses of the whole organization. Even if you cannot imagine stealing supplies in these circumstances (even if your children need them for school and you cannot afford them on your wages), you can surely imagine someone else doing so. Of course, if everyone came to that conclusion, the supplies would soon vanish, even if everyone had already been convinced that stealing is wrong.

In such a scenario Hardin (1968) suggests (citing Bateson's term) that one might find oneself in a "double bind," feeling guilty for wishing to exploit the commons but foolish for standing aside while others exploit it. Or one might feel angry, either at others for cheating or at oneself for not cheating, or both. One's perceived behavior of the others with whom one shares the system becomes an aspect of the system in which an act takes place. In making a moral argument against an appeal to conscience in the matter of overpopulation Hardin asks "whether, as a matter of policy, we should ever encourage the use of a technique the tendency (if not the intention) of which is psychologically pathogenic" (1247). Yet one might ask the same question of Hardin's rhetorical strategy,

through which, after all, a speaker or writer leads an audience through a narrative that makes its argument through audience members' own identification with it, thereby placing them in a psychologically intolerable situation they can relieve only by changing the way they act or think.

Now let us consider how Hardin applies his reasoning, by analogy, consistently to several contemporary examples, but inconsistently to his own subject, overpopulation. Once Hardin has demonstrated, with the assistance of his audience's self-concept, the high plausibility of the social relevance of his fable, he then only needs to suggest enthymematically that the story reveals by analogy the structure of other social and political situations, and the vicarious understanding of his audience should lead to conviction in the truth of Hardin's thesis.

Though doing so might seem patently obvious at first, we need first to spell out Hardin's enthymeme explicitly:

1. If the tragedy of the commons story applies rigorously and in detail to social or political situation X, the story illustrates X clearly.

3. The tragedy of the commons illustrates social or political situation X clearly.

This eccentric numbering alludes to the traditional understanding of the enthymeme as a syllogism with one of its three parts omitted. Aristotle asserted of the enthymeme that "rhetorical [demonstration] is enthymeme (and this is, generally speaking, the strongest of the [means of persuasion]) and the enthymeme is a sort of syllogism" (qtd. in Kennedy 1991, 33)[12] which is "drawn from few premises and often less than those of the primary syllogism" (42). In Toulmin's (1958) model of argument,

predominant in American argumentation studies during the past four decades, an enthymeme may be understood as a *unit of argument* with any one or more of its *claim* (including qualifiers or rebuttals to it), *warrant* (including evidence backing it), or *grounds*, omitted by the advocate and left to be inferred by the appropriate decision makers.

Finally, Aristotle writes that in rhetoric, "the conclusion should not be drawn from far back, nor is it necessary to include everything" (qtd. in Kennedy 1991, 187). Kennedy (1991) explains that "this suppression flatters the vanity of those to whom one speaks by leaving something to their intelligence and, in abridging the statement, makes it stronger and more lively" (297). Crick (2004) describes thought experiments in scientific argument as "enthymemes that rely on the active cooperation of speaker and audience to effect rhetorical persuasion through an appeal to the creative imagination of the hearers" (25). This is precisely Hardin's rhetorical goal.

Now let us apply Hardin's enthymeme to my introductory "Littering Passenger" story and "Saga of the Office Supplies." Recall that the first example concluded, in an echo of Hardin's thesis that we might all live more happily and securely with fewer people in the world. Now let us draw the same conclusion from the second example: "We might work more happily and securely with fewer people in this office, or if we could only curtail overemployment in the organization. Freedom to hire will bring ruin to all." But this obviously sarcastic conclusion is directly analogous to Hardin's.

Consider instead that we might work to change the system under which stealing office supplies can appear profitable and morally acceptable. By analogy, perhaps not overpopulation lies at the root of our problem, but the economic and social conditions

under which some parents inevitably conclude they need a large family. Alternatively, the citizens of nations posting the highest per capita consumption of global energy supplies and natural resources (currently Canada and the United States), or the members of what Freire (1988) called "the presence of the First-World in the Third World" (188), might need to stop breeding altogether.

So how does the suppressed term of Hardin's enthymeme read? Like this:

2. The commons fable applies by analogy *in rigorous detail* to social or political situation X.

Hardin makes this enthymematic argument in a series of cogent examples relating his fable to contemporary issues:

1. Western cattlemen pressure federal authorities to increase the allowable head count on land they lease, thereby leading to the degradation of their lands.

2. Maritime nations believe the oceans are inexhaustible and thereby act so as to bring numerous species to local, and nearly global, extinction.

3. The National Parks are open to all, but if all who wish to visit them do so frequently, the parks will soon become crowded and damaged.

4. "The rational man finds that his share of the costs of the wastes he discharges into the commons is less than the cost of purifying his wastes before releasing them. Since this is true for everyone, we are locked into a system of 'fouling our own nest'" (Hardin 1968, 1245).

Herein lies the profound appeal of Hardin's article to environmental advocates. If the abstract rational herdsman would participate in the destruction of a commons in front

of him, how much more readily will a corporate entity pollute an ecosystem it barely perceives or believes exists? When a firm's profits from sales to consumers disperse privately in the form of dividends and executive salaries, but the long-term clean-up or health care costs derived from toxic waste devolve socially to millions of taxpayers, corporations find themselves in a system wherein they must pollute, a system directly analogous to the hypothetical example of the tragedy of the commons fable. Therefore, we require strict laws either to prevent pollution or to charge all anticipated future costs of pollution to a firm's officers and shareholders. In Hardin's words, "The social arrangements that produce responsibility are arrangements that create coercion, of some sort" (1968, 1247).

This strikes me as a magnificent and rationally unassailable argument. This does not require, however, that a well-intentioned environmental activist must concede that the use of Hardin's rhetorical strategy necessitates acceptance of Hardin's proposal for "mutual coercion, mutually agreed upon" (1968, 1247) in the area of human reproduction, nor by implication, Hardin's ancillary political views.

WHERE'S YOUR DADDY?

Consider Sophia and Shreya. My newborn granddaughter Sophia not only converted gulps of milk into disconcerting volumes of waste, but required disposable and non-biodegradable diapers to contain it. Then she needed petroleum to run vehicles to carry it away and for the vinyl in her car seat and bassinet. Trees were felled for the wood in her crib, changing table, and nursery walls. She consumed more than the average medieval child did before reaching the age of reason, and she had just arrived. By contrast, her allegorical sister Shreya, in one of the poorest neighborhoods of south Asia,

consumes little more of the Earth's bounty than her food, if she survives regular depredations in her supply of that. About the differences between Sophia and Shreya, Hardin is resoundingly silent. C.W. Park writes that "Malthus made the mistake of considering the consumers' rather than the producers' role" (1965, 27). Hardin made the mistake of considering all consumers equal while assuming the producers' role constant.

An enthymeme only gains adherence with an audience that already shares some of the speaker's assumptions. It establishes identification among speaker, speech, and spoken to because the audience participates in making the argument with the speaker, as if they, in part, thought up the argument themselves.[13] "The distinctive nature of the enthymeme…is its ability to adapt to individual members of an audience, each of whom brings his or her own unique experience to the process of reconstruction" (Crick 2004, 29). So Hardin's case might sound a ring of truth because of one's instinctive preference for solitude, possibly grounded in some sense of misanthropy (recall Hardin's visions of pristine wildernesses and empty beaches), but that is not the only potential motive. P.J. O'Rourke, in his archly titled, "Overpopulation: Just Enough of Me, Way Too Much of You," observes that the population density of Fremont, California, roughly equates to that of Bangladesh, and asks "Is there any basic, scientific reason why Bangladesh can't be like Fremont, California?" (1994, 58) Here the classic conservative O'Rourke and democratic socialist Barry Commoner find some common ground: "population growth in the developing world ought to be brought into balance by the same means that have already succeeded elsewhere – improvement of living conditions, urgent efforts to reduce infant mortality, social security measures, and the resultant effects of desired family size, together with personal, voluntary contraceptive practice" (Commoner 1971, 242).

But O'Rourke goes further: "Fretting about overpopulation is a perfectly guilt-free—indeed, sanctimonious—way for 'progressives' to be racists" (61). If that seems harsh, perhaps O'Rourke was remembering the story of the night Paul Ehrlich (1968) first experienced "the *feel* of overpopulation," (16), which opens his best-selling *The Population Bomb:*

> "I have understood the population explosion intellectually for a long time. I came to understand it emotionally one stinking hot night in Delhi a couple of years ago. … The [taxi] seats were hopping with fleas. … As we crawled through the city, we entered a crowded slum area. … The streets seemed alive with people. People eating, people washing, people sleeping. People visiting, arguing, and screaming. People thrusting their hands through the taxi window, begging. People defecating and urinating. People clinging to buses. People herding animals. People, people, people, people. As we moved slowly through the mob, hand horn squawking, the dust, noise, heat, and cooking fires gave the scene a hellish aspect. Would we ever get to our hotel? (1968, 15)

So must we consider class prejudice, elitism, or xenophobia latent in the environmental movement in proportion to the popularity of "The Tragedy of the Commons?"

Certainly not. A careful examination of the suppressed line of Hardin's enthymeme shows that he misapplies his lucid thought experiment to his core area of concern. In a post-agrarian society, we cannot logically conflate the scenario of the tragedy of the commons with the decision of two parents to conceive and bear a child, or an additional child. The herdsman adds the cattle to the commons to fatten it for sale. It is capital. The firm pollutes the commons to increase its short-term net income. Parents, by contrast, do not add new children to devour the scarce resources of the commons for private profit. Children are neither pollutants nor capital – nor does income from them recapitulate, let alone exceed, the costs incurred in raising them. Men and women do not breed in order to fatten or strengthen their progeny for future profitable resale as slaves or

livestock. Even when we consider the social and emotional rewards of child-rearing, such as living in a loving family, or being cared for in old age, it is not the case that doubling the population of one's household doubles the love within it, nor that having three children in addition to one's first quadruples one's post-retirement security.

In most cultures of the 21st century, adding extra children to a family is no path to economic enrichment. In misogynistic societies, especially, adding a girl to the family represents immediate social and economic hardship for the family. Only in an agrarian society confined to a remote island would we need to apply the fable of the tragedy of the commons to the question of human population growth.[14] The rarity of short-term local aberrations, such as a social welfare commons in which those who breed are rewarded for doing so, or a zero-sum democracy in which a demographic minority breeds more rapidly in order to swamp the polls, merely illustrates the ubiquity of the general situation. Recent population arithmetic, in fact, suggests that the urgency of the so-called population problem at the dawn of the 21st century lies somewhere between that of the adrenal Ehrlich and the sanguine Commoner. "Compared with the situation at mid-century … today's demographic picture is decidedly more complex" (Brown, Gardner, and Halweil 1999, 18), in that population has declined in many areas of the world while many material limits to population growth have already been surpassed in others. Population is generally considered to have stabilized by 2007 in the industrially-developed world, with stabilization expected in Africa, South America, and South Asia by the middle of the 21st century, when the total world population should have reached around nine billion. Perhaps "population" has now become more like the "smog" of

Hardin's era, an acute concern in Los Angeles or Athens, but hardly a front burner issue in Wyoming or Newfoundland.

<div align="center">CONCLUSION</div>

An analogy from an internally consistent extended hypothetical example must apply in rigorous detail to a social or political situation if we are to say the example illustrates that situation. By that criterion, Hardin's application of his commons fable to the issue of overpopulation fails. An audience ready to accept the application of the commons allegory to overpopulation might already believe for other reasons that there are simply too many people in the world, or forget that, from the perspective of the Earth, all babies are created equally, but do not consume equally.

Still, "The Tragedy of the Commons" remains acutely relevant to environmentalists and scholars of rhetoric for three reasons. First, it provides an example of a vivid use of the thought experiment, the vicariously interpreted hypothetical example, which exerted genuine influence upon thousands of readers. Second, it demonstrates that, because "the parable fits some situations much better than others" (Soroos 1995, 435), but many of its readers chose not to extrapolate from it with strict logical consistency, the article served in large part for many as a political tract published under the imprimatur of objective science. Finally, Hardin has provided, in "The Tragedy of the Commons" a paradigm example of ecological rhetoric.

In analyzing the general rhetorical pattern of four best-selling authors (including Paul Ehrlich) whom he calls "scientistic thinkers" offering "modern-day apocalyptic discourse" with visions of future conditions … endowed with scientific legitimacy," David Payne (1989) finds that, "Science reveals what is necessary for survival … as a

kind of all-encompassing spiritual way of understanding and determining nature and priorities. … They seek a permanent solution to failures caused by improper adaptation, and the change involves a fundamental change of individual identity" (62). In other words, they make a transcendent appeal to a force beyond the individual reader to whom the reader should adapt in order to bring about a better world. Ehrlich, "at once the most strictly scientific and the most apocalyptic" of the authors Payne examines (1989, 63), creates in *The Population Bomb* fantastic scenarios of horrifying futures that readers can perhaps help forestall by taking the specific actions described in the book's final chapter. If they do not, however, they will be compelled to watch the starvations of millions on the evening television news. It is exactly the sort of appeal to conscience that Hardin deduces will fail over the long-term.

So how does the ecological rhetoric of Hardin differ from the environmental rhetoric of someone like Ehrlich? Garrett Hardin speaks and writes directly and interpersonally to each member of a mass audience, each of whom he invites to reflect intrapersonally on how his or her own character, taken in the aggregate, could damage the organizational, public, or ecological networks to which he or she is connected. Hardin's appeal is immanent. The self-concept of the listener, the listener's social and economic relationships, and the contents of the biosphere are tightly networked into a single entity, a change in one affecting, or effecting, a change in the whole. Ehrlich's story says, "If you're like me, you'll want to help." Carson's story says, "You could end up like them if you don't change." Hardin's story says, "Look at him; you know you're the same; therefore, you will bring ruin upon yourself if you don't change." Hardin does not need to transcend the network of energy flows, societies, and individual self-concepts that

comprise the biosphere in order to fashion a rhetorical appeal. If rhetoric as an appeal to conscience is indeed counterproductive, ecological rhetoric remains essential for articulating and bringing about more sustainable social arrangements than those that currently persist.

So Hardin's article persists in its influence, while Ehrlich's *The Population Bomb*, on the same subject, and with the same intent, reads like a bemusing artifact extracted from a 1960s time capsule. Ehrlich recounted terrifying statistics and postulated dire scenarios, but when the scenarios did not materialize, his book passed into obscurity. Hardin remains relevant because the structure of his thought experiment still cogently expresses the core problem underlying many political and economic situations. Of course, it is easy to point out that Hardin takes a narrow view of human nature, or that the herdsman is a product of a particular, if not peculiar, culture. "At the heart of all social theory is the contrast between humans as motivated almost exclusively by narrow self-interest and humans as motivated by concern for others or for society as a whole" (Dietz, Dolšak, Ostrom, and Stern 2002, 4). We need not settle that debate here to understand the structure and force of Hardin's rhetorical accomplishment.

Yet, because Hardin did not apply his own extended hypothetical example with logical consistency, it turns out that his fable remains directly relevant to virtually every environmental issue *except* overpopulation. We may safely ignore Hardin the political philosopher while imitating with admiration Hardin the ecological rhetor, as have readers familiar only with excerpts of his article. We need not throw out the irresistible baby with the political bath water.

¹ Also significant is the possibility that image events are the new speeches. For DeLuca, the image event is a drama or performance enacted in the presence of individuals with access to media of mass communication and of such intrinsic interest that it becomes "news," where its appearance functions as a message broadcast to a general audience. DeLuca credits environmental activists, notably the Canadian organization Greenpeace, with inventing the image event, but just as ecological rhetoric need not necessarily promote conversation or wilderness preservation, an image event can promote whatever its authors wish. When we wonder, as have many writers since DeLuca, why certain image events are more successful than others, I think we find much of the methodological toolkit of established rhetorical criticism acutely relevant still. In comparing, for example, disparate image events such as Hands Across America and 9/11 (which illustrate the outer edges of both the ineffective/effective and the good intent/evil intent continua), "one speaker/one speech" might be passé, but "one source/one image event" might generate a lot of what would read like straightforward rhetorical criticism, and perhaps act as a nodal point for the rhetorical, quantitative, and performative traditions in US Communication Studies.

² Its full title was *Population, Evolution, and Birth Control: A Collage of Controversial Readings*. It included an excerpt from the 1833 Wm. Forster Lloyd lecture that Hardin later expanded upon in "The Tragedy of the Commons."

³ "Mutation démographique" in Bouthoul (1964, 12). "La vraie mutation biologique subie par l'espèce humaine dans son ensemble consiste en une *acceleration* de son potentiel d'expansion numérique" (12). (Trans. K. Ells).

⁴ In a note facing the title page of his book *The Population Bomb* (1968) Paul R. Ehrlich credits a 1954 pamphlet from the Hugh Moore Fund (established in 1944 to fund organizations interesting in world peace and world population) with coining the terms "population bomb" and "population explosion."

⁵ For example, C.W. Park (1965) had already asked (rhetorically), "If a plugged wash-basin is being filled at a greater rate than the overflow can take and the water escapes onto the floor, do we seize our mops and engage in a relentless fight against the cascade? Do we rush for buckets to contain the flow? Common sense suggests that we restrict the supply, we turn off the tap" (98).

⁶ As opposed to a strict Malthusian. Park explains the distinction. Hardin was in favor of birth control and against international food aid in developing countries whereas Malthus urged "'moral restraint' in marriage as a preventive check to population increase. He was not an advocate of birth control in the modern sense of the term and would not have supported present practices" (1965, 26).

⁷ In Bouthoul (1964, 221): "l'infanticide différé."

⁸ Hardin's further assertion that "'Space' is no escape" (1968, 1243) might strike 21st century readers as a more pedestrian observation than it might have seemed in 1968, near the apex of the Space Age.

[9] Ellipsis in original text; my italics. Compare Hardin's prose style and perspective to that of one of the best-known passages from Thomas Hobbes's *Leviathan* (1968, 185-6): "During the time men live without a common Power to keep them all in awe, they are in that condition which is called Warre; and such a warre, as is of every man, against every man. … In such condition, there is no place for industry; because the fruit thereof is uncertain: and consequently no Culture of the Earth, no Navigation … no Knowledge of the face of the Earth; no account of Time; no Arts; no Letters; no Society; and which is worst of all, continuall feare, and danger of violent death."

[10] Following the American colonial era, two perspectives on nature developed in American nature writing during the late nineteenth century, one anthropocentric and one spiritual, the conservationist and the preservationist. The two roads diverged for good in the social and political schism between two mutual friends of President T.H. Roosevelt, Gifford Pinchot and John Muir, over the proposal to dam the Hetch Hetchy Valley east of San Francisco. "In both a political and philosophical sense, the roots of the modern environmental movement can be traced directly to Muir and his work" (Payne, 1996, 102). "He unified the aesthetic, rational, and ethical response to nature … [and] he supplied a motivation for preservation of natural scenery" (Oravec 1981, 258). Pinchot, on the other hand, considered himself the father of conservation, and it is his legacy which survives in the organizational cultures of the National Forest Service and the Bureau of Land Management (Shabecoff 2003).

[11] George J.W. Goodman, under the pseudonym "Adam Smith," used this method explicitly in chapter 3 of *Paper Money* (1981), and exposed the "trick" in chapter 4 (46-55).

[12] The bracketed terms replace the Greek words *apodeixis* and *pisteis*, respectively, left untranslated in George A. Kennedy's English text of *Techne Rhetorike* but defined as such by Kennedy on 33, n22 and 30, n9.

[13] A paraphrase of a remark by Valerie Renegar in response to an earlier version of this paper presented at the 2005 Western States Communication Association Convention.

[14] One might speculate upon the direction of the cause and effect relationship linking Hardin's intellectual calculations and his politics. I wonder whether the latter might not have helped blind Hardin to the logical inconsistencies of the former. Or perhaps they were mutually reinforcing, like the early nineteenth century tradition in the American South of Bible interpretation, and that region's "peculiar institution."

CHAPTER 3

"INNIS, ILLICH, INTERSTATE":
ECOLOGICAL RHETORIC THROUGH MEDIA ECOLOGY

> What's a route? ... Studying the vast domain of meaning transmissions, or if you prefer, the modes of transport of messages and men through space and time, mediology could not but pay homage to an unrecognized medium like the route. ... The route in its simplest expression is the tangible trace materially inscribed in the ground. The route in the abstract is archetype, symbol, ritual, obsession, dream, emblem... ... Without losing the larger sense: all lines of repeatable and reversible itineraries, whatever be the physical surroundings.
>
> --Régis Debray[1]

So the critical apparatus of rhetorical studies in use at the inauguration of American environmental communication studies (Oravec 1981) is still in good health. Even if there were no other famous environmental speech to analyze, plenty remains in the way of books, environmental impact assessments, journalism, public participation at community hearings, advertising, greenwashing, propaganda, image events, and advocacy campaigns that rhetorical analysis can elucidate. Much of current media studies consists of the rhetorical criticism of specific audio-visual texts or performances or an identifiable series of them. Moreover, most successful environmental communication to Generation G (Greenpeace → Gaia → die Grünen → Gore) has been mediated electronically to multiple audiences from disparate and corporate message sources, so this chapter turns to the more sociological and critical approach to communication theory called *media ecology* of late in the U.S. but as much in the mainstream of Communication[s], in Canada, Australia, France, and the U.K. as are social science research methods in U.S. Communication Studies.

Media ecology is distinct from other approaches to media studies in its focus on the technical structure and social effects of media rather than their content or even ownership. So if an environmental crisis has been accelerated by technology, then media

ecology is a valid perspective from which to reflect on ecological rhetoric. As Harold

Fromm writes, "Nature, whose effects on man were formerly immediate, is now mediated

by technology so that it appears that technology and not nature is actually responsible for

everything" (1994, 35). Media ecology, in brief, conceives of media as environments but

also, though less often, environments as media. No matter which aspect of what has been

described as the Promethean (Strate 2000), pre-paradigmatic science (Nystrom 1973) of

media ecology, a conception of *media* and of *environment* are inextricably linked

throughout what Lance Strate, the first President of the Media Ecology Association,

routinely calls "the media ecology intellectual tradition" (2004).

We begin in this chapter by demonstrating the practical use of classifying all

media of communication as records, channels, and environments, and then explore the

roots of media ecology, contrasting it with other approaches to media studies, and

comparing its majority branch (media as environments) with its minority one

(environments as media). After a necessary detour through of the thought of Ivan Illich,

we apply a media ecology perspective to a peculiar selection of text for the traditional

rhetorical critic, the U.S. Interstate. In conclusion, we discuss the essential materiality of

ecological rhetoric.

<div align="center">CHANNELS, RECORDS, ENVIRONMENTS</div>

Discussing an intellectual tradition that links conceptions of media and

environment is perhaps more justifiable if one can show at the outset that "environment"

can be considered one of the fundamental few classifications of communications media

themselves. Undergraduate communication textbooks usually describe media as

channels, diagramming them as straight as the one down the syringe of the inoculation

metaphor rejected as narrowly deterministic in the accompanying text. And message follows arrow from sender to receiver, often with a reverse arrow of feedback beneath, with a hazy ellipse or multipoint star labeled "noise" hovering nearby. Advanced models depict arrowheads on *both* sides of the channel/medium. But surely some media *record* what the channels transmit and can retransmit those *records* at or to a future time. Moreover, the word "medium" denotes among other things a substance through which a thing is carried or transmitted, so in addition to channels or records, a medium can constitute or at times create an *environment* through which we move or in which we glean signs of life.

We can think more lucidly about media if we set aside distracting adjectives like *mass*, *electronic*, or *broadcast*, and resist the temptation to encompass with "media", say, technology, or all possible *technique*. As wide a net as the Canadian political economist Harold Innis cast for the term *media*, he focused it sharply toward a communicative denotation, and imposed on it a parsimonious scheme of classification (space-biased vs. time-biased, that is, perishable or durable, light vs. heavy). Without such constraint, the concept of media can grow amorphously, especially in the work of two generations of McLuhan (1987) and their admiring successors, to include virtually everything already encompassed by equally polysemous terms like tool, technique, procedure, or sign.

So consider media, in short, *what we go through* to get through from ourselves to another, however many intermediate(d) steps lie between, or *what has been gone through* to get through to us, however remote, corporate, or imaginary the imputed source. Medium, mediator, go-between: we *go through* media, in the broadest senses, and any

53

apprehension of media without at least a passing family resemblance to this image will be too nebulous to be of any great conceptual use.

Next, a demonstration of the practical application of this simple tripartite classification of media: first, by rapidly sketching with it the history of human communications media; and second, by using it to reconcile a few apparently disparate media theories in showing them to be imagining media primarily as records, or as channels, or as environments. This will necessitate no neologisms, simply applying media's multiple metaphors consistently.

Media History

Environments, channels, and *records* represent the fundamental classifications of human communications media as well as their earliest and paradigm historical eras. Humans attended to nonverbal signals in their original "natural" environments, as do all life forms in theirs. Only later did people build their own communicative environments. It is in *channels* of communication that humans were pioneers, and remain the sole experts. Touch was surely our first channel (including its abstractions into gesture and gaze), but speech was our proprietary one. By channel I am writing to you of a means whereby one sentient being intentionally directs a message comprising one or more signs to another through a particular conduit. I am also creating a record of that writing. Whether a medium be channel or environment or record depends on how it is used or experienced. For example, air is a medium as environment *through* which one may walk, and *in* which one may perceive visual, olfactory, or auditory indices, but air is a medium as channel when used as a conduit to convey sonic utterances from the throat of one being to the vibrating aural receptors of another. Similarly, water is an environment through and in

which a whale, for example, finds food and company, but a channel for emitting or attending to whale-song across vast spans of ocean. So speech, a network of symbols made possible by our innate linguistic capacity, became the richest of channels. Again, Times Square on New Year's Eve is an environment, but the cell phone on which you describe your presence there to someone on a Midwestern farm is a channel. Telephones and telegraphs are channels; billboards and posters create new environments.

At one remove from speech is writing, speech made flesh, that is, script, frozen speech, the visual impression, engraving, or depiction of syllables (as in Chinese) or phonemes. Humans did not create the first or only records, but they were unique in creating detailed records of organized and communal symbols consciously intended to persist through time. Again, classification follows use. Paper allows for record making, but when identical sheets of inked paper are posted throughout a town, they comprise a medium as environment. So environments-channels-records largely summarizes the first three historical and technical eras of human communication – nonverbal codes, speech, and writing. Only three eras remain, and we can easily use environments-channels-records to illuminate the full import of all three – printing, electrical transmission, and networking.

The printing press extended script into an era of its technical reproducibility in print. While script provided several intellectual tools unavailable in oral cultures, including the classification of information in graphical tables, the ranking of disparate items in lists, and the retention of formulas in algorithms and recipes (Goody 1977), the printing press, distributed across a subcontinent of cultures fluent with phonetic scripts, created in addition "the novelty of being able to assemble diverse records and reference

guides, and of being able to study them without having to transcribe them at the same time," and permitted a "wider range of reading matter that was being surveyed at one time by one pair of eyes" (Eisenstein 1979, 686). Here was the original analog precursor to hypertext, through which any student can now assemble at electric speed the equivalent of a library table bricked up with books from his or her own virtual press.[2] The printing press did not simply manufacture various records (books, pamphlets, broadsheets, tabloids), but allowed for two additional things new under the sun – mass communication, and the ability to alter the communicative nature of a built environment.

Mass communication is distinct from other communicative modes (*e.g.*, interpersonal, group, public) in that its intended audience is neither physically present nor precisely enumerable. Though sometimes identified with electronic transmissions of news and entertainment content by profit-oriented media organizations ("the media"), electricity is neither sufficient nor necessary to define mass communication. The printing press allowed copious copies of informative or persuasive messages to reach as many people as there were units printed, as well as an unknown, possibly vast, number of readers passing copies hand to hand, or finding them on coffee house or tavern tables. As spectacular a best-seller as Thomas Paine's *Common Sense* was in early 1776, its number of buyers was a mere slice of the number who read it, and a shard of those who heard of and grasped the gist of it.

The printing press also allowed for rapid changes in the built environment of a village or town. Whereas signs identifying homes or shops remained among a relatively stable array of signals comprising the built environment through which a community member might pass (as a termite through soil or fish through water), the printing press

allowed for rapid quantitative and qualitative changes in this environment. Not only could newssheets and posters proliferate throughout a public space, they could convey detailed information, exhortations, perspectives, and warnings that could alter rapidly from one day or week to the next. The printing press allowed for the acceleration and intensification of purposive changes in local environments.

Writing his dissertation on transportation and communication in 1894, the year of Innis's birth, Charles Horton Cooley was about as close to the introduction of the telegraph, our penultimate revolution in human communication, as you are to the first use of the Internet's forerunner ARPANET (during the month of the first moon landing). "The most important fact about the telegraph is at once the most obvious and innocent," Carey (1988) explains, as succinctly as it has ever been explained, "it permitted for the first time the effective separation of communication from transportation" (203). Prior to the telegraph, messages could only propagate as quickly as the fastest horses ran or down whichever tracks the iron horses steamed.

Electricity gave old media wings. Not long after writing flashed across the Atlantic Ocean down a cable laid along its floor, conversations took place between people first on separate floors of a house and finally distant continents. Then radio lifted electrical transmission out of its cat's cradle of cables into the troposphere. Media channels (still our term for television transmissions on a particular wavelength) proliferated and accelerated. Media records multiplied in scope and depth with the invention of coded disks and magnetic tape. And radio created a pervasive new environment. Mr. Smith could follow a stream of speech from one street-level shop to another all the way to Washington, or make of his home either a listening post for

transmissions or a chamber music or swing jazz parlor. A television tuned for fifteen to thirty minutes to a news broadcast is a channel, but left on all day or evening in the background, to be attended to or not, creates a new environment. Car and transistor radios (the original iPods), could make of the entire sensate nonhuman environment itself a medium dense with messages.

All new media since Morse and Marconi have been some sort of telegraph or some kind of radio, or some combination of the two. The Internet is our most recent technical revolution in human communication, and its significance seems difficult for some to summarize because it subsumes virtually all previous media, and exemplifies all three classifications of media discussed so far. This Queen of All Media is capable of transmitting through electrical channels both linguistic and nonverbal codes, as well as records of script (calligraphy, tables, recipes, formulas), print, plastic or photographed images, voice, and movement, to individual people, geographically disparate but culturally cohesive groups, or a potential mass audience. If the content of new media is, at least at first, old media, the Internet is unique in that its content can potentially comprehend all media, almost without exception. In addition, its users can remain connected with one another, often in a rich international electronic network allowing them to interact with one another far more extensively and directly than they ever could by radio, as they never really could through television. We will explore the implications of networked communication more extensively in our penultimate chapter.

Media Theories

A second advantage of the "environments-channels-records" classification is the ability to reconcile various media theories that tend to focus on media in one particular

aspect without dismissing a certain theory as limited simply because it does not deal with media of all three types.

For example, Cooley thought modern communication had "obsolesced," to use McLuhan's invented transitive, the old distances of scale. For Cooley, communication was "the mechanism through which human symbols develop—all the symbols of the mind, together with the means of conveying them through space and preserving them in time" (qtd. in Peters 1999, 194). While Cooley saw communication in a double sense of transfer and transportation, transfer between minds and transportation across space (Peters 1999), his colleague John Dewey conceived of it in the sense of transmission, and as a field in which a people built a community (Carey 1988, 14). So Cooley was differentiating media as records from media as channels, as Innis did a half century later, and Innis's French successor Régis Debray does today a half century after Innis. Both Innis and Debray compare and contrast channels and records, Innis referring to space- and time-biased media, and Debray distinguishing between *communication* through space in the present and cultural *transmission* through time from the past or to the future. By contrast, Dewey understood the conceptual connection between media and environment. Similarly, the information theory of Shannon and Weaver was devised to solve technical challenges pertaining to a specific electric channel, while the histories of script by Goody (1977) and print by Eisenstein (1979) deal chiefly with the cultural use of, or vulnerability to, innovations in the production of specific forms of records.

So "environments-channels-records" lets us summarize the handful of seminal technical innovations in the history of human communication swiftly by way of three straightforward concepts. It also allows for a detailed but focused discussion of media

without identifying the term so broadly as to be synonymous with, say, "technique," or "communication," or "method," or "everything."

The astute reader has by now remarked that I have used the word "environment" rather loosely so far, sometimes writing of it as a sort of ether which affects us as we move through it, and sometimes as a milieu in which we can stand and decipher messages apparent to us. Though I surely do not hold the patent on using the word environment loosely, I will resolve this initial ambiguity by exploring a perspective variously referred to as media influence, mediology (Debray 1999), or medium theory (Meyrowitz 1985), but increasingly in American journals and conference panels as *media ecology*. Sternberg (2002) posits a yin-yang simile for media ecology as the complementary and interdependent study of media as environments and environments as media. Media environments reorganize intrapersonal communication and environing media influence interpersonal communication, and the emphasis on the former is historically and currently predominant over the latter.

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MEDIA ECOLOGY

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Almost entirely a 21st century presence in U.S. Communication Studies, media ecology has long been integrated with mainstream Communication(s) research in the rest of the English-speaking world, and in Europe.[3] Unlike journalism research, which would examine, for example, in the area of environmental communication, why journalists find it difficult "to report on long-term systemic processes, threaded through with scientific uncertainty and contentious debate" (Smith 2000, 4), or how the idea of the environment circulates differently in an industrially developed society like the U.K. than in an economically developing one such as India (Chapman, *et al.* 1997), or unlike mass media

research, which might, in the same area, look into "the processes which – relatively independently of the nature and severity of environmental problems – lead to certain environmental issues becoming the 'dominant' issues at certain times, issues which in turn become short-hand referents, icons, or even allegorical representations of the environment" (Anders 1993, xvi), or explore "the role of the mass media in the history of environmentalism in the U.S." (Neuzil and Kovarik 1996, xxiii), media ecology is barely if ever concerned with media content at all.

The key distinction between the media ecology perspective and mainstream mass communication research is that the latter is concerned almost exclusively with media *content* and media ecology all but ignores content. The hypodermic needle or Silver Bullet model of media influence may have few true adherents in academe (proponents of "vulgar mass comm" are more numerous in talk radio and cable TV punditry and barstool political science), but a weaker version of these metaphors, summarized in Lasswell's 1948 linear communications model (*i.e.*: Who says what to whom in what channel with what effect?) animates thousands of term papers and journal submissions. Even researchers who eschew North American quantitative studies of short term "media effects," as in British and Australian audience studies, are still interested in what preferred or resistant readings audience members ascribe to media content. American variants of audience studies such as cultivation analysis and even uses and gratifications research are likewise concerned almost exclusively with the content of mass media channels. As Joshua Meyrowitz writes, "No matter how many intervening factors are taken into account, the vast majority of media studies do not stray far from the original

assumptions that media 'inject' something into people and that the study of media effects, therefore, must begin with an analysis of *what* is injected" (1985, 14).

Meyrowitz is writing about quantitative social science methods applied to mass media research, but a preoccupation with effects is also found early in U.S. rhetorical studies. Edwin Black's seminal 1965 critique of American rhetorical criticism as it developed after the landmark 1925 essay of Herbert Wichelns (Black's dissertation director a generation later) castigated what Black called "neo-Aristotelian" critics for, among other things, placing undue emphasis upon the "effect" of a given oration or instance of public address.

One student of the Canadian 1960s media guru Marshall McLuhan encapsulated the core insight, by contrast, of media ecology: "a medium of communication is not merely a passive conduit for the transmission of information, but rather an active force in creating new social patterns and new perceptual realities" (Logan 1986, 24-5).[4] In other words, "the involvement of information technologies and communication formats with activities shapes and changes those activities. Moreover, one cannot adequately understand those activities without considering the underlying communicative foundation that silently guides symbolic interaction" (Altheide 1995, 213). It is not that "the means of communication *wholly* shape culture and personality," Meyrowitz adds, "but … that changes in communication patterns are one very important contributant to social change and one that has been generally been overlooked" (1985, 18). Debray writes that "the mediological manner or cast of mind consists in putting one's finger on the *intersections* between intellectual, material and social life, and in making these too silent hinges grate audibly" (1996, 19).

Now, any Canadian recalls McLuhan when hearing the words "communication" or "media," as do American communication scholars upon hearing the word "Canada." McLuhan popularized the notion of media as extensions of the human senses or mind (while influentially identifying the term "medium" with every conceivable tool or technique, including the electric light bulb), and though his most famous aphorism is perhaps universally known, "to say that any technology ... creates a new environment is a much better way of saying that the medium is the message" (Sanderson and MacDonald 1989, 218). McLuhan meant that "the effect of all new technologies is to impose, silently and pervasively, their deep assumptions upon the psyche" (Kroker 1984, 56). Writers frequently take McLuhan too seriously or not seriously enough, either emulating his discursive and oracular style, or dismissing his theses outright because of his unconventional and poetic manner of propounding them.[5]

Some have thrashed out the germ and let the chaff fly, finding McLuhan correct in essence, if unconvincing in detail or method. For example, rather than embracing or ignoring McLuhan's pronouncements about the revolutionary effects of the printing press (1962), Eisenstein carefully examined the transition between the eras of script and print, finding in print a neglected factor in explaining Europe's transformation from its Middle Age to its modern era. Eisenstein agrees, in essence, that "a medium is nurtured and grows through the environment, which may or may not make demands of it" (Debray 1996, 14), and "the 'techno-' is upstream from or at the heart of the 'socio-'" (22).

This was McLuhan's older colleague Harold Innis's insight, too, and Innis's insight first. Innis would have agreed with Cooley that communication is the mechanism through which symbols are developed and conveyed, but added that the technical

structure of the conveyances explained more about the social influences of communication than the symbols being conveyed. In James W. Carey's estimation, "Innis's work, despite its maddeningly obscure, opaque and elliptical character, is the great achievement in communications on this continent" (1988, 142). And though Innis wrote little of the connection between media and environment, to paraphrase Alfred North Whitehead's remark about Plato, the safest characterization of the media ecology mainstream is that it consists of a series of footnotes to Innis.

HAROLD INNIS

Harold Adams Innis was an economist by training (PhD 1920, U. Chicago), and is still known in Canada as the father of Canadian political economy and proponent of the "staples thesis," which examines the economic bases of a culture geographically marginal or tangential to an empire to understand the cultural consequences of extracting, transporting, and exporting its raw materials (staple goods) to an external economic center of power (such as Great Britain or the U.S.). Innis applied his synthesis of geography, economics, political science, and sociology at length to the fur trade across the Canadian Shield (1930), and then to the Atlantic cod fishery (1940). In exploring his next case, the West coast pulp and paper industry, Innis became fascinated less with the industry's product than with how that product propagated cultural information, and came to develop a theory of history based upon material changes in media of cultural transmission and preservation. Like Cooley, Innis "found in communication a non-Marxist engine of history," (Peters 1999, 185), a materialist explanation of social and cultural change driven by media of communication. He had abstracted from the geographic transportation of staple goods to the spatial propagation and temporal

retention of social and cultural messages, asserting that empires in history persisted or declined through the preservation or introduction of the media they used for transporting not staple goods, but stable ideas – that is, through communication. Media made mind concrete in culture.

For Innis, the most durable civilizations transacted their affairs through a balance of time- and space-bound media. "Space" Innis associated with politics, extension, centralization, and expansion, and "time" with religion, duration, decentralization, and culture. New media introduced into a society tended to undermine what Innis called, by analogy with a common concept in political economy, a "monopoly of knowledge" (1951, 50) acquired by the practitioners of established media, leading to social change. As clearly as Innis ever summarized his thesis, he did so thusly:

> Media that emphasize time are those that are durable in character, such as parchment, clay, and stone. The heavy materials are suited to the development of architecture and sculpture. Media that emphasize space are apt to be less durable in character, such as papyrus and paper. The latter are suited to wide areas in administration and trade. … Materials that emphasize time favour decentralization and hierarchical types of institutions, while those that emphasize space favour centralization and systems of government less hierarchical in character. Large-scale political organizations such as empires must be considered from the standpoint of two dimensions, those of space and time. Empires persist by overcoming the bias of media which overemphasizes either dimension. They have tended to flourish under conditions in which civilization reflects the influence of more than one medium, and in which the bias of one medium toward centralization is offset by the bias of another medium towards decentralization. (1984, 5)

For example, writing aids in the distribution of information over a large space, but erodes a citizenry's capacity to live by its founding myths through time. Writing first petrified oral culture, and then favored innovation over tradition. Some media balance space and time superbly. A medium to replace print, for example, would need to match

its unique synthesis of durability, size, portability, and affordability. "The book (or newspaper) is not perfect, but it is a workable compromise between many ideals," (Abramson, Arterton, and Orren 1988, 59).

"Ideally, a civilization would have media enabling it to control extensive territory and at the same time keep its customs and values relatively intact" (Eamon 1987, 8), because "unless media favoring time and space exist as independent traditions offsetting and checking the biases of one another, the society will be dominated by a narrow monopoly [wherein] politics becomes sacralized or religion secularized; science destroys morality or morality emasculates science; tradition gives way to the notion of progress or chronic change obliterates tradition" (Carey 1968, 280). Innis saw mid-twentieth century North America, even before television, which reached Canada only a month after his early death in 1952, as a profoundly *space*-biased society, with little means by which the culture could communicate its sense of itself to itself and to future generations through *time*. "A culture or social tradition finally earns the fate of the devices of memory that back it up, and each new mediasphere short-circuits the class of hegemonic mediators issuing out of its predecessor" (Debray 1996, 31).[6]

The contrast with Innis's junior colleague McLuhan was stark, as Carey, perhaps alone in the U.S., pointed out in 1968 at the height of McLuhan's stratospheric (though ultimately parabolic) popularity. Innis was a geographer and economist seeing in media an engine of historical change and only in passing as a means of altered sense perception. Unfortunately, Innis was little known in the U.S. during his lifetime, and McLuhan's later glosses on his work (paragraph upon paragraph of McLuhan's 1964 best-seller *Understanding Media* read like syntheses of Innis's writing), but with little of Innis's

critical, political, economic, and social perspective, had been consigned to the dustbin of academe by the time of McLuhan's hilarious but irrelevant cameo in Woody Allen's *Annie Hall* (1977), and his death in 1980.[7]

A less noted but fundamental difference between the two, however, also indicates a vital conceptual distinction between environmental and ecological rhetoric. In a superb literature review of the media ecology tradition, Strate called McLuhan, Walter Ong, and Neil Postman "the three prime nodes of media ecology" (2004, 5), while acknowledging Innis's status with some as media ecology's first scholar and his influence on McLuhan in first using the term "media" as his object of analysis, but remarking how McLuhan broadened and diverged "from Innis's purely materialistic sense of the word" (8). It is precisely this purely materialistic sense of media which must never be lost if media ecology is to remain a productive perspective from which to approach problems in environmental communication in particular or rhetoric in general.

We turn next to the minority perspective in the media ecology tradition, one which attempted with considerable success to ground so-called medium theory in the material world of everyday speech and social interaction, and thereby explain how media as apprehended by McLuhan and his many successors brought about the social effects documented by Innis and his fewer successors.

THE FLIP SIDE

For Postman, media are not only cultural environments, but also everything Mumford (1934) called "technics" and Jacques Ellul (1964) *technique*, "the totality of methods rationally arrived at and having absolute efficiency (for a given stage of development) in every field of human activity" (15).This is intriguing, but I resist

defining media so broadly.[8] For Postman, perhaps, and likely Strate, and surely McLuhan, even a cultural tendency the Frankfurt School called "instrumental rationality" could be a medium, as could language itself. This raises a question of media ecology often asked of McLuhan's definition of media, namely, what is it *not*? "What was everywhere needed," the Canadian anthropologist Edmund Carpenter wrote of the early days of Canadian media studies, "was the sort of media sophistication which comes only with detachment, dislocation, study" (1972, 191).

Aside from the tendency of some to conflate it with other more carefully circumscribed fields or other critical or research methods, media ecologists often leave unanswered the central question of agency, namely, exactly *how* do new media environments effect social change? In short, what's the route? Media ecology forerunners tended to focus on changes in patterns either of perception or of social behavior. Even if the answer to the How of social change were Perception (or worldview, or perceptual set), one still needed to understand how such a change allowed for new behaviors in private and public life. To date, some detailed answers with respect to specific media have been proposed. For example, several plausible, if partial, hypotheses have been offered by scholars peering upstream to determine why printing revolutionized Renaissance Europe but not medieval China (Eisenstein 1979; Logan 1986; Debray 1999), and Innis provided a partial general answer in suggesting that new media dislocated monopolies of knowledge held by particular social groups in mastering established media, but how might we ascertain what lies beyond the banks or around the next bends of the torrent we float in now?

The answer might lie in the direction of sociology or anthropology, especially since the intersection of media ecology and anthropology had been present from the start. In 1953 Carpenter founded and co-edited a pioneering media studies journal with McLuhan (*Explorations: Studies in Culture and Communication*), and he conducted extensive ethnographic fieldwork well into the 1970s in the South Pacific, documenting the cultural impact of the introduction of technical innovations in recording and channeling information (chiefly the adoption of still and film cameras and radio) upon indigenous pre-electric cultures. "I think media are so powerful they swallow cultures," Carpenter wrote. "I think of them as invisible environments which surround and destroy old environments" (1972, 191). But the mechanism whereby this took place was unclear.

By the 1970s, Christine Nystrom had also been thinking of media ecology as much in a sociological as psychological framework, calling her "pre-paradigmatic science" a study of "the social, symbolic, and cultural environments" that produce "the structuring of human meaning," that is, communication (qtd. in Sternberg 2002). Finally, in *No Sense of Place* (1985) Joshua Meyrowitz spanned the theoretical gap between what he called (as have many communication studies textbook authors since) the "medium theory" of Innis and McLuhan and the "situationism" of the sociologist Erving Goffman:

> Both focus on the overall effects of the larger structure of the environment. More important, the medium theorists and the situations implicitly deal with a similar theme: patterns of access to each other. The situationists suggest how our particular actions and words are shaped by our knowledge of who has access to them, and the medium theorists suggest that new media change such patterns of access. (33)

If people in society tend to be, as Goffman's detailed qualitative research suggests they are, different people in different situations, consistent in behavior across similar situations, but subtly or entirely different as situations vary, then media that impinge

69

upon, contract, or expand familiar situations will create widespread changes in social behavior. For example, Goffman writes about the familiar (or readily imaginable) difference between the "backstage" behavior of waiters in a restaurant kitchen and their "front stage" behavior tableside. Taking situations of affiliation, transition, and authority as the most fundamental of social roles played on a daily basis, Meyrowitz discusses in detail how television brings backstage behavior into the foreground in all three situations, leading a mass audience to doubt what is socially appropriate or "natural" with respect to the performance of gender, the stages by which a child is socialized into adulthood, and the now ubiquitous impulse to bring down political heroes to the level of the common citizen. Meyrowitz calls a social situation an information-system, "a given pattern of access to the behavior of other people" (37), and argues that television does not change the physical settings of old situations, but the patterns of information flow within them. Perhaps TV violence, a virtual subgenre of "effects" research, does not desensitize viewers to the pain of others so much as acculturate them to the routine presence in the home of immediately visible violence about which they can do nothing and therefore need not do anything.[9]

Because changes in social situations, the structures of which escape most people's conscious awareness, are an unintended consequence of technical innovations in communication (26), electronic media, Meyrowitz observed, not only connected old social networks but created new ones that changed society and social behavior. A new Interstate, for example, does not just make cars faster, but more numerous, while adding bigger trucks, subtracting trains, marginalizing towns, and increasing prices.[10]

Let us extend the example of the Interstate much further. The following set-piece, "Innis, Illich, Interstate," applies media ecology as a critical perspective to the Interstate (a concrete case study in two senses) in order to illustrate how the media ecology perspective, in drawing upon insights from psychology, sociology, and anthropology in order to think the concepts of media and environment in tandem, can extend the reach of rhetorical criticism. In conclusion, a brief meta-critique of "Innis, Illich, Interstate," will relate media ecology to ecological rhetoric, and explain how each understands *kairos* as a medium, in both senses in which I have seemed to be writing about media as environments.

"INNIS, ILLICH, INTERSTATE"

> We see the automobile but not the highway system, gasoline storage facilities, refineries, petroleum tankers, no more than we see the research installations upstream and all the maintenance and safety equipment downstream.
> --Régis Debray

In examining the Interstate from the standpoint of media ecology, we will ponder the following: What is the Interstate? Can one feel a sense of place on the Interstate? How does the Interstate feel to its embodied observer? If the Interstate is a place, where is it? And what does this place do to the spaces it replaces and occupies? Does the Interstate transport not only goods, but also ideas? What does the Interstate do, or how does it do what it does? Can we consider the Interstate as a medium of communication? If so, what is the Interstate saying to us? How and what does the Interstate communicate? As Lorimer writes:

> Buildings, pictures, statues, coins, banners, stained glass, songs, medallions, and rituals of all kinds are mass media in that they involve institutions communicating with members of society. Today, they remain media of centralized mass communication but we do not often talk about them as mass media institutions. (2002, 1)

In taking the question *What is the Interstate saying?* literally, I will consider the Interstate in three separate senses: first, as a medium of communication in the way Harold Innis used the term; second, as a technique or tool, applying Ivan Illich's notion of the convivial tool to ask what the Interstate does or allows us to do with it; and third, through my own bodily experience of the Interstate, first as a body alone, and then encased by an auto body.

Innis

Innis's theory that new media of communication arise to speak to, or around, or underneath, the institutions established by old media brings to mind the manner of speech and source of knowledge of many writers and thinkers offering a more environmental or sensuous perspective counter to the paradigm of mainstream North American culture. Perhaps numerous environmentalists, immersed in the media milieu and political culture of a wholly space-biased global empire, have felt what George Grant called the deep "intimations of deprival" (1969, 139) of what Innis calls the values of time. "As we drive more and more of the land's wild voices into the oblivion of extinction," Abram writes, "our own languages become increasingly impoverished by weightlessness, progressively emptied of their earthly resonance" (1996, 86).

Think of the widespread preference among environmentalists for community economic development, grassroots politics, and decentralization. Environmental politics is rich with support of small-scale economics, appropriate technology, and cultural diversity (read *preservation*). The call for a *sustainable* society is, in the title of one of Innis's major essays, "A Plea for Time." Perhaps we are now reading Nature itself as a time-bound medium for information on what a less space-biased society would look like.

At first blush, the Interstate might appear to be a space-biased medium. It allows people and cargoes to overcome the barriers of geography as never before. A trip from St. Louis to the Oregon coast that took Lewis and Clark over a year takes a few days on the Interstate. But perhaps we anticipate a discussion of what the Interstate *does*, rather than what it *says*. Remember that Innis's space-biased media were light and readily transportable. The Interstate, by contrast, is as heavy, fixed, immobile and unmovable an architectural construction as the Vatican, the Pyramids, or the St. Louis Arch. Like them, the Interstate is a monument.

Now, the Vatican still communicates its meaning in a relevant way to those of the world's billion Catholics who can visit it, but the Pyramids have little to say to Muslims in contemporary Egypt, and while the St. Louis arch serves as a symbol of its city, as do singular towers in Seattle, Paris, and Toronto, its connection to the "gateway to the West" metaphor is now rather tenuous. Should the whole American Empire pass away one day like the works of Shelley's "Ozymandias," the Interstate will remain, perhaps for millennia, as have coliseums around the Mediterranean, despite having been quarried for centuries for city and house walls by successor cultures to the Roman Empire, as an monument to the civilization that erected it. Interpretative archaeologists of another 4th millennium will realize the structure was designed to facilitate the transportation of vehicles freighted with passengers, cargo, and meaning, but what plausible explanation would they propose about us, as Tilley (1994) puts it, to produce our past in a manner relevant to their present? A septet of suppositions:

1. The economic relevance and relative importance of the cities linked by this monumental structure were expected to persist in the state in which they found

themselves in the third quarter of the 20th century for as long as the Interstate lasted, as were the cities and city-states connected by the roads and aqueducts of the Roman Empire.

2. All commercially essential transportation across land was to be carried by this single structure, while a rail network for heavy freight separate from that for individual passenger vehicles fell into gradual disuse. Vehicles of individual citizens competed for space at high speed with large corporate and government vehicles, a practice perhaps emblematic of the society as a whole.

3. Given the only sporadic evidence exists citizens who shared vehicles were granted preferential access to the structure, the use of individual vehicles was evidently strongly encouraged. This perhaps explains why citizen vehicles seemed to grow larger in size over time, to give them parity with corporate vehicles, and power over citizens who could only afford smaller vehicles.

4. Following this observation, the structure was clearly built solely for those with economic access to vehicles fast enough to use it. Owners of bicycles, scooters, mopeds, and other energy-efficient vehicles, or of cars or buses with smaller or older engines, were not invited to use the Interstate. They were likely at physical risk in attempting to use it and actively discouraged from doing so by minimum-speed regulations. So people without access to the most expensive range of vehicles were limited to travel within their own communities, most of which had tangential if any access to the Interstate.

5. The ability of a human to move from one place to another at maximum speed was of infinitely greater value than the ecosystems, rivers, forests, marshes,

hills, and small mountains existing in the space between the places, so the human species was deemed the sole proprietor of the surface of the Earth, which was conceived as pure space, a plane. If the places arrayed across that plane could not be moved closer together geographically, then they needed to be moved together temporally, through the construction of speedways.

6. But there was something at least as valuable as speed, and that was the atomization of the individual in his or her own mechanical device for navigating the Interstate. The individual, or at most his or her nuclear family in an SUV, had to be free to range, but not to travel in community. Were one to exalt solely the value of speed over space, one would construct not Interstates, but a network of high-speed trains to carry people and cargo faster and more safely. But then people would need to work together, travel in community, and be protected from competition with the routes used to carry freight. The key to the mode of capitalism represented by the Interstate was not individual freedom, but mandated individual competition.

7. And what had this to do with the environment? Nothing. Human culture had so cleanly separated itself from its physical experience of its environment, it could only feel in response to its own milieu of cultural production, its own network of power relations.

As Bill McKibben argued (1989), once we realize any copse of trees might be a farm, any climatic shift might derive from our own industrial activity, what will we do when not nature, but the idea of Nature, is gone, when it seeps into our consciousness that

there is nothing out there but us? I think a long drive on the Interstate might foreshadow the answer to McKibben's elegiac question.

Analysis of this sort builds upon Innis's and my own classifications of media, as well as Meyrowitz's proposed amalgamation of McLuhan and Goffman. Though Innis was thinking chiefly about the preservation in time-bound media of texts bearing cultural messages, extending his metaphor of time to an example of the type of transportation system Innis analyzed so effectively in his earlier work on the fur trade and cod fisheries allows us to apply his thought to a wider range of objects of analysis, but also connects Innis to the subsequent view of media ecology that interpreted media as environments, and analyzed changes in media environments through research methods established in anthropology and archaeology. This analysis also concurs with Meyrowitz's perspective, since it concerns how an Interstate creates a new information system that extends or alters established patterns of social interaction. As for my own classification of media, the Interstate comprises an environment in which a user reads particular cues and signals, a channel or conduit for certain information or information sources, and from the standpoint of an imaginary future culture, an archaeological record.

Large tracts of the media ecology terrain, however, deal with the specific manner in which a new medium is put to use, whether by individuals, owners of media organizations, politicians, or in daily social interactions. Since this can lead to the concept of media growing too unwieldy to be of much theoretical use, it will be useful to anchor the metaphor of media as tool or technique as concretely as possible, as it is in the thought of Ivan Illich, largely passed over in most writing in the media ecology tradition.

<u>Illich</u>

  In a masterful literature review of the media ecology tradition, Strate (2004)

provides chapters on Ong and Postman (to whom his survey is dedicated), as well as

McLuhan, Innis, Havelock, Ellul, and Mumford. Now, one core insight of media ecology,

accepting for the moment the McLuhan tradition of defining media as broadly as

possible, is that a change in technique will close off some opportunities while opening up

others, and impose certain constraints while removing others. The critic's task is to

discern the cultural consequences of a new mix of opportunities and constraints presented

by new media. Few critics have conducted such analysis as lucidly as the Viennese

historian, pastor, and radical ecologist Ivan Illich, but his work is mentioned only briefly

in Strate's review.

  Illich (1926-2002) was an independent public intellectual who wrote seminal

works on economics, education, gender, technology, religion, medicine, energy policy,

literacy, and politics. He examined how organizational structures of professionally-

trained technicians better perpetuate themselves than serve the people supposed to benefit

from the products their systems are ostensibly established to provide, such as health,

education, or welfare. Illich's neologism *iatrogenic,* an adverse medical condition or

reaction induced inadvertently by medical treatment or diagnostic procedures, has entered

the language.

  In calling for the abolition of schools as currently organized, Illich distinguished

schooling from learning, and insisted teachers not act as conduits, let alone funnels, of

knowledge, but as facilitators of self-directed learning in environments open to the world.

He believed schools reflect and replicate a dehumanizing consumerist culture in which

"registered students submit to certified teachers in order to obtain certificates of their own." (1971) Erich Fromm (1971) called Illich a "humanist radical," one who "questions every idea and every institution from the standpoint of whether it helps or hinders man's capacity for greater aliveness and joy."

In *Tools for Conviviality*, Illich (1973) promotes the use of what he calls *convivial* as opposed to industrial tools. By conviviality, Illich means to "designate the opposite of industrial productivity … interpersonal freedom realized in personal interdependence and, as such, an intrinsic ethical value" (11). His thesis is worth quoting in full:

> Tools are intrinsic to social relationships. An individual relates himself in action to his society through the use of tools that he actively masters, or by which he is passively acted upon. To the degree that he masters his tools, he can invest the world with his meaning; to the degree that he is mastered by his tools, the shape of the tool determines his own self-image. Convivial tools are those which give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her own vision. Industrial tools deny this possibility to those who use them and they allow their designers to determine the meaning and expectations of others. Most tools today cannot be used in a convivial fashion. (22)

So "most hand tools lend themselves to convivial use" (23), as do a few institutions such as the telephone, the US Postal Service, or the rural Mexican marketplace. A quarter-century later, we might add e-mail, though e-mail supervised by corporate technicians or a panoptic computer program ranks with "anticonvivial or manipulatory tools" (25), as does a dentist's drill, in Illich's example, which is restricted in its use by law to members of a latter-day guild. Illich aimed to foster research into the manner in which convivial tools were perverted into manipulatory uses as part of a long-range project of effecting a transition to socialism, but his perspective should be no less useful in contributing to the growth of a greener biosphere and Greener public sphere.

In the spirit of Innis, surely unknowingly, Illich suggests a convivial society is not defined by "the total absence of manipulative institutions and addictive goods and services, but the *balance between* [my italics] those tools which create the specific demands they are specialized to satisfy, and those complimentary, enabling tools which foster self-realization" (25). Viewed through this lens, the Interstate is clearly a tool that creates the need it is designed to satisfy. The need for speed, for space, for a collapsing of space into time, distance into duration, ("How many hours are we from Chicago?"), was both created by the Interstate and satisfied by it, except in urban ring roads late in the day or in the week, or during inclement weather.

I do not as Illich does consider networks of multi-lane highways (such as the Interstate) destructive no matter who uses them, robbing the rich and poor alike of conviviality (27-8). If we are speaking of individual persons in their own bodies, the rich have the option of using short stretches of the Interstate to shuttle themselves to airports, whereas the poor do not. If we speak of the legal persons in corporate bodies, the Interstate is a made-to-order convivial tool. Cells of a corporate body, like tractor-trailers, might see the Interstate in a convivial fashion, whereas for atoms of the body politic such as you and I, the Interstate is a manipulatory tool unbalanced (in Innis's sense) by any countervailing convivial structure for human transportation.

Interstate

John Livingston (1984) writes, "The naturalist, as phenomenologist, tries to temporarily step out of the paradigm. In the ideal sense, he is not 'observing,' nor even 'perceiving.' He is experiencing" (66). Elsewhere, Livingston describes experiencing the presence of a benign Other in the form of a stray tomcat that wandered into his kitchen

79

one night. He calls for an environmental rhetoric of testimony, of bearing public witness to one felt experience of the wild as an extension of oneself (1981). So because a media environment is always experienced by a particular embodied observer, and the overlap between anthropology and media ecology has been present if not always followed up upon for over a half century, the final example of a rhetorical analysis of an artefact from a media ecology perspective will take a more auto-ethnographic, perhaps phenomenological, or naturalistic, turn.

On my way through Cheneyville, Louisiana, one night, a truck flashed its high beams at me. I understood the signal, and was already driving at the speed limit of 35 past the disused gas station and shuttered houses. Passing a bend in the road across some railway tracks, I saw a sign reading 45 MPH. By the time I had reached the sign, so I was later told, I was driving at 47 MPH. A police officer pulled me over and cited me for driving, within 25 yards of a 45 MPH zone, on the way out of town, at 12 MPH over the speed limit. This would never have happened if I had not strayed from home and looked for a shorter route. I had no sense of how to behave in this place. I needed to go home, back to the Interstate.

Power operates through established discursive regimes, as Foucault (1976) explained in detail, and the Interstate illustrates this concept vividly. When one drives on the Interstate within a prescribed range of speeds of which the speed textually posted by law enforcement entities is an approximate maximum, one feels the bodily sensations associated with safety. However, when one leaves the Interstate, one knows viscerally that one is in direct competition for the only lane of transportation available with enormous vehicles that could crush both body and auto body in a moment. One also

enters a discursive regime of police officers, judges, mechanical sensing devices, and speed laws that change rapidly from place to place, a regime designed not to promote public safety, but to increase the financial resources of municipalities abandoned by the Interstate. The result? Drivers cling to the Interstate, thereby encouraging the disciplinary regimes of power to increase surveillance on the few drivers remaining. But the system of power is not merely repressive, but also productive. Before long, drivers invent and purchase devices to electronically alert them to nearby machines of surveillance, and thereby *feel* better behind the wheel.

There is nothing so much as the Interstate for me that exacerbates Abram's sense that "To acknowledge that 'I am this body' … is to affirm the uncanniness of this physical form." (1996, 46) Walking under the Interstate or alongside it on some little-used bike trails in Alexandria, the town I live in, I feel somewhat overwhelmed by it. It towers above me on concrete pylons, arches over me, four traffic lanes with shoulders wide. It strikes me as something not built for humans or the human body. Not even the shrubbery planted alongside and underneath it a few years ago in anticipation of international tourists visiting a local exhibition of Spanish art make the I-49 in Alexandria inviting to me. I cannot walk among the plants, or scale the slopes they decorate. They are for the eyes of visitors in cars, not for the sensuous participation of the ambling soul. I have never seen a human being *using* the I-49 for anything, except for a prostitute early one morning, before dawn, standing under an overpass for shelter. I can imagine walking along this I-49, sauntering down its perforated painted yellow line, gazing out at nondescript landscapes, only in a world without any other people in it, or on a distant future archaeological expedition. I stand underneath it and the vehicles using it

sound like airplanes passing overhead. If, during a walk in the woods, the woods present themselves, the I-49 allows no such opportunity, for the life at its periphery is inaccessible, and its surface is physically dangerous.

What happens, however, when I extend this body by way of a machine that allows me to use the Interstate in relative safety, perhaps comfort, even joy? Then I need to explore the phenomenological distinction between my peripatetic body, and my technologically extended, automotive body. The Canadian environmental philosopher Neil Evernden uses the analogy of territoriality in other species as a means of clarifying the phenomenology of experience explicated by Maurice Merleau-Ponty, whom he writes "has most thoroughly explored our misconceptions of man-in-world and elaborated the most detailed alternative" (1985, 43). Evernden describes the stickleback fish, who behaves, it would appear, unrealistically, or imprudently, with respect to larger fish once his territory has been established. "It is as if the boundary of what the fish considers to be *himself* has expanded to the dimensions of the territory. … It is as if there were a kind of field to the territory, with the self present throughout but more concentrated at the core." (44) Similarly, my self is concentrated in my vehicle on the Interstate, while my visceral sense of my territory extends to all free space around me, to all open lanes ahead, and to the road I can see ahead.

When I nestle my body into my vehicle, the Interstate's indigenous life form, my experience of my territory, my field of freedom of action, expands on the Interstate far beyond what I experience driving on city or state roads. "The boundaries of a living body are open and indeterminate; more like membranes than barriers, they define a surface of metamorphosis and exchange" (Abram 1996, 46). On back roads meandering alongside

bayous, my car is an extension of my legs, and I roll placidly along, observing the homes and trees, the farms, and families, but on state roads I enter into a system of stealth and graft. I continually drive through towns in which police officers lie in wait not for me to endanger myself in my vehicle, let alone any townspeople with my vehicle, but to commit a mechanical or technical error involving the coordination of my visual and tactile senses with the speed of my vehicle and the careful posting of variously graded speed limit signs. The fines bear neither quantitative nor logical relation to road conditions, vehicular speed, geography, or each other. I enter into a regulatory system designed more to extract funds from drivers unfamiliar with a given locale than to protect the safety of its inhabitants.

In this milieu, the Interstate is liberating. The rules are simpler, and one may follow them for hours on end without having to worry about falling into a trap set for the unwary. My visceral experience of my territory is happier, larger, more expansive, and flexible when I drive on the Interstate. I feel freer, and safer, from encroachments into my space by the regulatory territories of anonymous officials lying in wait among the residue of the wild along the roadsides. This sense of territory, as Evernden perceives it, is for me perhaps the clearest way in which I can express how my extended technological body experiences the Interstate as an automotive body as opposed to an ambulatory one. I experience the Interstate as an isolated body as oppressive and forbidding, but in the extension of my territory made possible by my vehicle, I experience it as inviting, simplifying, and liberating with respect to a patchwork of geographically-bound, malevolent local territories of coercion.

Inferences

Joe Weber (2004) cautiously celebrates the Interstate as a progenitor, not of new places, but of new categories of interesting everyday places, such as interchanges, beltways, hazard areas, landmarks, sites of accidental death, and views. He reads the Interstate as something of a geographic franchise operation, replacing specific places with intrinsically fascinating generic places. Jarvis sounds a skeptical note in specifically citing "the rising hegemony of standardized, undifferentiated spaces, areas depleted of history, drained of the possibility for relations, identity, narrative and significant social action," (1998, 190) as a disturbing trend toward self-erasure and willful negation of meaning in the contemporary geographical imagination.

In Innis's terms, the Interstate is a time-bound medium of communication, a monument that we do not need to await the interpretative analysis of imagined future archaeologists to decipher. Following Illich, consider the Interstate as a convivial tool for corporate bodies, and a manipulatory tool for ordinary human ones. As for the bodily experience of the Interstate, relevant not only to media ecology's early association with anthropology, but also to the psychological notion of media as environment and the sociological one of environment as media, we might need to use the Interstate to move from one place to another, and given the alternative, we might prefer to. But we can only prefer to by paying attention to the desires of the body. And if we choose to use an Interstate, we might learn to avoid, or at least be wary of, the oft-expressed possibility, that we make our tools and then our tools make us. As insurgent architects, "through changing our world we change ourselves, (Harvey 2000, 234). But the reverse is also

84

true. Perhaps choosing more bodily grounded media of communication may let us quiet down, slow down, and listen better for Grant's "intimations of deprival."

If we can solve the riddle of the Interstate, Miles Richardson once suggested in a 2004 class lecture, we can solve the riddle of one another. I can only experience the Interstate with physical comfort and joy if I extend my geographical sense of self beyond the contours of my skin, hair, and clothing. Perhaps, by analogy, the Interstate teaches us that if we can extend our sense of self outward, and not necessarily through inserting our bodies into a machine, if we can experience our territory as larger, and more inclusive, than the biological machine in which our ghost flits about, thinking and feeling, that perhaps we will find the extended selves of others become part of who we are, and that to harm them, or see them come to harm, is to directly harm ourselves. A strange lesson to draw from a monument to individual competition, perhaps, but maybe, like indigenous cultures who learn from their surrounding forests, rivers, and seashores, who gain wisdom on walkabouts through what we now call the wilderness, we, too, can learn from our experience our own lessons in our own environments we have built for ourselves, but might not yet have entirely closed us in. An unexpected exit might lie just ahead.

<div align="center">CONCLUSIONS</div>

In conclusion, let us first consider Debray's definition of a route, that which mediates one place and another in a repeatable and reversible manner whatever the milieu, and think of media ecology as a route that is also a bridge. In computer networking, a bridge is an electronic device allowing for seamless connection and data transfer between two segments of a larger network. In this final section, I shall briefly point out how media ecology might bridge two at times contrary approaches in the

American communication tradition, and then bridge media ecology and ecological rhetoric in order to show how the one helps elucidate the other.

First of all, Debray's definition of *mediology* as "the discipline that treats of the higher social functions in their relations with the technical means of transmission" (1996, 11) having as its object "the study of the *ways and means of symbolic efficacy*" (7), resonates soundly with rhetoric as conceived not only in US rhetorical studies, but by the first teachers of rhetoric in ancient Syracuse and Athens.

To summarize one core insight of media ecology, a new medium introduced into a culture opens some doors and closes others, so if one need of society is to understand which doors are opening and closing, and to freely choose what is best for the community accordingly, the duty of the media ecologist to remind the community of this need, and explicate the implied choices, makes media ecology directly relevant to all rhetorical instruction from invention (selection of media), through style (visual communication and media literacy), to delivery (what various media allow and forbid speakers and audiences to observe and perceive).

When we turn to the central concern of critical cultural studies, at times seen in opposition to the paradigm of rhetorical criticism as it has developed in the U.S. Speech Communication tradition, the connection to media ecology seems explicit. The domain of cultural studies asks questions such as these: is culture like a language? is it a way of life? what is the relationship of culture to biology? is gender equality possible or desirable? how does late-capitalism sustain itself culturally? what is the role of global media organizations in cultural production? (Barker 2003) Though not an exhaustive list, we

can see many obvious areas of common concern in the core contents of critical cultural studies and media ecology.

Along with forerunners such as Mumford, Ellul, and Innis, media ecologists seem to hearken to what Canadians call "small-c" conservatism that "shares with socialism a belief that there are classes, that capitalism necessarily involves inequality, and that the market-place should not be the locus of most important social decisions" (Marchak, 1987, 13). This conservatism holds that a society should not welcome just any force or technique into a functioning democratic society that could undermine its hard-won and precarious freedoms, or practices that promote autonomy and freedom, without what the Canadian Senate has long called "sober second thought." This perspective would meet with the *general* approval of a plane of thinkers claimed by media ecology: Mumford, Ellul, Innis, Ong, Postman, and Paul Virilio.[11]

When faced with a new invention, process, or medium of communication, a media ecologist will ask the following: which doors will this new technique open? which will it close? do we really want these doors opened or closed? [and who is this "we?"] what will we become in response to our new "technical environment" (Virilio 2002)? will we become more democratic or less, freer or less so, more able to choose our own futures or less? As Neil Postman (2000) puts the matter:

> To be quite honest about it, I don't see any point in studying media unless one does so within a moral or ethical context. I am not alone in believing this. Some of the most important media scholars—Lewis Mumford and Jacques Ellul, for example—could scarcely write a word about technology without conveying a sense of either its humanistic or anti-humanistic consequences.

Postman is barely a stone's throw here from either Ciceronian traditionalists or proponents of critical / cultural studies like Raymie McKerrow (1989). Many rhetorical

critics, critical theorists, and mass communication scholars would agree that the duty of

the intellectual is to analyze the workings of power and culture and expose it to the

powerless, or at least propose alternatives to how power might productively be used.

Even McLuhan said, surely too rarely, that simply because he described where he saw

society heading did not mean he approved of it (McMahon 2002).[12] So media ecology,

with its liberationist conservatism (in line with the idea of conservation – a core value of

media ecologists, ecologists, and environmentalists alike), is logically congruent with the

fundamental concerns of many American scholars of media, rhetoric, and culture, and

provides a conceptual and philosophical bridge between rhetorical studies and critical

cultural studies in the U.S.

Finally, what does the media ecology perspective teach not about environmental

rhetoric, persuasive discourse about environmental issues, but about ecological rhetoric,

rhetoric considered from an ecological perspective?

Of course, media ecology by definition evokes a connection between

communication and environment evident in some form in all branches of the media

ecology intellectual tradition. Some think of media as environments that surround or

envelop individuals, social situations, or even whole cultures. Others think of media

environments as a sort of substance through which or in which people speak or act. In

reiterating a couple influential if not numerous calls in communication studies, including

that of Meyrowitz, for an integration of media studies and interpersonal communication

research Sternberg calls (2002) media-as-environments and environments-as-media the

yang and yin of media ecology. On what basis, however, do we connect so-called

medium theory with interpersonal communication as opposed to, say, small group

research or public speaking?

We can follow Meyrowitz back to Innis and forward to Debray to uncover a

salient common factor. Innis is remembered for his non-Marxist materialistic theory of

history. Debray's "mediology" seeks to analyze the "dynamic combination of

intermediary procedures and bodies that interpose themselves between a producing of

signs and a producing of events" (1996, 17). What links thinkers such as Innis,

Meyrowitz, Goody, Eisenstein, and Debray is the understanding that media are *material*,

and their effects on people, groups, social situations, and cultures are material ones that

can at least in principle be discovered and demonstrated.

There is nothing mystical or spiritual, or ultimately, particularly mysterious about

media effects (effects of media as such, of course, not the content they convey – the

watershed, not the riverboats) once they are seen as material forces with material effects.

This is how media ecology can shed light on rhetoric from an ecological perspective.

Environmental rhetoric may appeal, sometimes with great success, to a so-called spirit or

aesthetic sense, and it may invoke complex symbols of harmony and unity or other

abstractions, though in differentiating environmental communication studies from

communication research in general, Peterson suggests that "especially for those who

come from a rhetorical perspective, the materiality of environmental communication

research has to stand out" (2007, 2). Ecological rhetoric likewise understands

communication and persuasion as material, as a series of physical signs traveling through

specific substances, or in observable surroundings, or through traceable networks, or

within specific and describable social situations. Some media ecologists or environmental

advocates might write or speak of paradigm shifts, consciousness-raising, or cultural awakenings, but anyone wondering how environmental communication studies can contribute to the general understanding of communication or rhetoric appreciates the materiality of ecological rhetoric, and knows to seek out, if not an Interstate between self and other, a detailed answer to a single question, in short, "What's the route?"

NOTES

[1] "Qu'est-ce qu'une route? Étudiant le vaste domaine des transmissions de sens, ou si l'on préfère les modes de transport des messages et des hommes à travers l'espace et le temps, la médiologie ne pouvait que rendre hommage an [*sic*] médium inconnu qu'est la route. … [L]a route en sa plus simple expression [est] la trace tangible inscrite matériellement dans le sol. La route dans l'abstrait est archétype. symbole, rituel, obsession, rêverie, emblème… … Sans perdre de vue le sens large: toute ligne d'itinéraire répétable et réversible, quel que soit le milieu physique." (1996 1. Trans. K. Ells.)

[2] But to riff on Sartre's remark about Paul Valéry, Copernicus assembled diverse records and reference guides to study them at one time by one pair of eyes, no doubt about it, but not every freshman who assembles diverse blogs and wikis to study from one search engine for one pair of deadlines is Copernicus.

[3] If not under that name. *Cf.* McQuail (1984), Fiske (1990), Mattelart and Mattelart (2004) – college-level introductions to the field from the UK, Australia, and France. See also the Media and Communications curriculum of the Swiss-American European Graduate School <http://www.egs.edu>. In critiquing the bulk of US "media effects" research for its "near exclusive concern with content," Joshua Meyrowitz (1985, 342, n2) finds "the British and European approaches to media are more eclectic." British and Australian Communication Studies have more in common with each other than either does with the American Speech tradition, and they intersect expansively with the milieu of Canadian communication theory, with Canadian and Australian scholars even devoting whole journal numbers to one another's work [*cf. Canadian Journal of Communication*, 23(4) "Joint Issue with *Australian-Canadian Studies*," 1998].

[4] Of media studies' best-known Canadian pioneers, Harold Innis focused on the social patterns and McLuhan the perceptual realities. "A person who is literate has a different world view than one who receives information exclusively through oral communication," Logan continues (24-5), an example foregrounding the perceptual realities. The two most succinct overviews of orality-literacy studies, inaugurated in Harold Innis's *Empire and Communications* (1950), are conveniently titled *Orality and Literacy* and *Literacy and Orality*, respectively by Ong (1982) and edited by Olson and Torrance (1991). Classicists will prefer Eric Havelock's *Preface to Plato* (1963). Of the arc in the third quarter of twentieth century North American communication theory

from Innis to McLuhan, Carey slyly recalls Oscar Wilde's remark upon viewing Niagara Falls: "It would be more impressive if it ran the other way" (1988, 142).

[5] Examples of the latter type of writer abound in the still interesting *McLuhan; Pro and Con* (Ed. R. Rosenthal). Mark Kingwell archly dubs the former type of writer McClones (1997, E1).

[6] This paragraph, as a brief illustrative example, is typical of Innis's style, with quotes from supporting sources packed in with the author's comments and clarifications.

[7] It might have been otherwise. At the University of Chicago, Innis took a political science course from Robert Park, a contemporary of Cooley. Both Cooley and Park studied with John Dewey and George Herbert Mead. All four, with William James, comprised a large part of the early 20th century American critique of positivism. Innis was offered a professorship under very generous terms by the University of Chicago in 1946 (Heyer 2003, 33), with free rein to pursue any project of his choosing. Innis apparently considered the offer seriously, but decided his roots in Canada were too deep. Innis biographer Paul Heyer suggests Innis might have relished the position he had attained in his academic career in Canada. He was a college dean by then, and according to Eric Havelock, readily accepted appointments to Royal Commissions and other public bodies that brought him into contact with Canada's influential class (2003, 31-2). The year after the Chicago offer, Innis gave a series of lectures on communication at Oxford University that a British publisher released to virtually no academic notice in 1950 under the title *Empire and Communications*. A selection of Innis' essays on communication was published by his own university's press a year later, but by that time, Innis was ill with brain cancer, with little time or energy for sustained writing projects, let alone his massive "History of Communications" manuscript, unedited and unpublished to this day.

[8] Others have not so resisted. In his millennial keynote address to the first Media Ecology Association Conference, Lance Strate, said of media ecology: "It is the study of media environments, the idea that technology and techniques, modes of information and codes of communication play a leading role in human affairs. Media ecology is the Toronto School, and the New York School. It is technological determinism, hard and soft, and technological evolution. It is media logic, medium theory, mediology. It is McLuhan Studies, orality–literacy studies, American cultural studies. It is grammar and rhetoric, semiotics and systems theory, the history and the philosophy of technology. It is the postindustrial and the postmodern, and the preliterate and prehistoric (2000)." For Postman, "media ecology takes as its domain the cultural consequences of media or technological change, and how media affect our forms of social organization, our cognitive habits, and our political ideas. It is concerned with how we define media, where we look for cultural change, and how we link changes in our media environment with changes in our ways of behaving and feeling" (1998, 5).

[9] One is reminded of a incident in 2007 in which an entire auditorium of college students attending a John Kerry speech remained seated while an unruly questioner's now catchphrase request "Don't Tase me, bro'!" went unheeded by campus security. In a segment on *The Colbert Report* (19 September 2007, Comedy Central) Stephen Colbert

seemed to be close to speaking as himself rather than as "Stephen Colbert" in his withering description of the "Solitarity" generation, including one seated student on videotape to whom Colbert attributes the thought, "I wish they'd stop Tasering this guy so I could go home and watch this guy getting Tasered on YouTube."

[10] This encapsulates an example of Marshall McLuhan's posthumous achievement, in collaboration with his son Eric, in proposing a systematic approach to so-called "McLuhanism," what both McLuhans called the Laws of Media (1987). In brief, every new medium enhances, obsolesces, retrieves and reverses. That is to say, a new medium increases the range or efficiency of some human function, makes some other function obsolete, retrieves a dormant function from the past, and when used to too great an extent, creates a new problem. For example, the cell phone enhances vocal communication, makes land lines obsolete, brings back the era of the walkie-talkie, and once everyone is expected to be immediately accessible regardless of location, turns into a leash.

[11] Several among these were devout Catholics (Ellul, McLuhan, Ong, Virilio), seeing themselves bearing witness to changes that could likely not work out well in the long run. All saw the introduction of new techniques (in the widest possible sense – new τέχνη – tools, technologies, media of communication, procedures, processes) as potentially subversive of social institutions that citizens would wish to conserve for the future and bequeath to a subsequent generation.

[12] If Innis's contemporary French intellectual heir is Régis Debray, McLuhan's is Jean Baudrillard, who did not publish his first theoretical book until the year after he reviewed McLuhan's *Understanding Media* for a French periodical. He later called McLuhan a revolutionary in media analysis. Both McLuhan and Baudrillard are often criticized for a mélange of brilliant insights and undertheorized conceptual frameworks. Baudrillard sees theory as always needing to be *in advance*; McLuhan saw his work as a series of "probes" designed to stimulate further thought. Small wonder Carey (1993) called McLuhan "the first postmodernist." Yet McLuhan and Baudrillard each viewed their respective "hyperreal" milieus with distaste.

CHAPTER 4

RED SKY IN MORNING:
ECOLOGICAL RHETORIC THROUGH SEMIOTICS

One can imagine a reader of the previous chapter, even if s/he found merit in it, turning its final page with a sense that one piece of the puzzle was still missing. One cannot interpret an artifact of rhetorical or cultural criticism like the Interstate as, for example, this or that sort of technique unless one considers Illich's classification of tools as somehow ontologically prior to the phenomenon of the Interstate impinging upon the senses of the critic. Similarly, consider how much of whatever persuasive force carried by the analysis inspired by Innis lay in the deliberately complex narrative perspective of treating what could not have been other than a series of interpretations of contemporary cultural behaviors and artifacts as something of a science fiction story in which imaginary future archaeologists interpret a system of roadways in widespread use as if the whole system were a monument to a past civilization. Were the analysis simply a series of what sophomore argumentation textbooks call arguments from sign (*i.e.* X means Y), I can imagine a reader responding to such an analysis with more skepticism. If one is not reporting on a phenomenological experience of an environing medium or a mediated environment, on what basis does one offer an *interpretation* of what impinges upon the senses? What exactly is going on when considering media as environments or environments as media and therefrom drawing conclusions about either one?

Sherlock Holmes's silent dog in the night in the previous chapter, the shoe that didn't drop, was, of course, semiotics. Since semiotics, the science or doctrine of signs, can readily come into play when examining discourse mediated by records or channels of communication, it is finally unavoidable when conceiving a medium as creating or

modifying an entire environment of signals, or when reading a particular environment, such as a forest or Interstate system, as a medium dense with signs of life or signs of social or political bias. So we set aside semiotics no longer. As Marc Leverette writes, "*Interpreting* the media environment is an important step towards uniting semiotic analysis and medium theory. If we can approach the environment from this two-prong strategy, we will further ourselves in comprehending its 'effects,' 'messages,' and 'massage'" (2003; italics in original).

In this chapter we begin with last century's first best-selling writer on semiotics, Roland Barthes, and show his method as structurally identical to the one used by all people everywhere to survive in their prehistoric environments, or for short, "nature." To do this, we will review the two most widely known paradigms of semiotics, and will prefer to that of Barthes's compatriot Ferdinand de Saussure the American semiotics of Charles Sanders Peirce. Finally we will apply Peircean semiotics to the most celebrated instance of environmental communication in the public sphere of the past decade or so, David Guggenheim's documentary of former Vice-President Al Gore's public lecture on global warming, *An Inconvenient Truth.* This will allow us in conclusion to distinguish ecological from environmental rhetoric on the basis of its reliance upon the index, or indicator, over the icon or symbol.

<h3 style="text-align:center">SEMIOTIC ENVIRONMENTS</h3>

A medium as environment is, of course, a *semiotic environment,* a milieu dense with signs. If Barthes could walk through urban Paris and declare that "either everything has meaning or nothing has," our earliest forebears surely intuited something similar about the nonhuman realm into which they found themselves thrown. (Those tending

toward the former option in Barthes's epigram surely survived longer to propagate themselves than those leaning toward the latter one.) What in current political discourse goes by the name of "the environment," the entire sensate nonhuman world, comprised for all early humans not just "the environment," but a particular semiotic environment. It remains so today, though in greatly diminished importance compared with human-built environments.

Dense with signs, our first world was, but what manner of sign? In C.S. Peirce's terms, the archaic semiotic environment was saturated with indices, and bereft of icons and symbols. Peirce distinguished among index, icon, and symbol in the following way: An *index* posits, literally indicates, a direct relationship, usually a causal connection, between a sign and its real-life referent (the hoary "smoking gun," for example); an *icon* is a physical representation (usually visual or sonic image) of the referent; and the connection between a *symbol* and its referent is arbitrary, conventional, determined by custom and culture. Whatever birdsong or urine traces might have meant symbolically to the birds and beasts, they were mere indices to us, as was most of what we perceived of other people with whom we walked, hunted, and gathered in "nature." Now, these early others also provided us early on with rudimentary icons (vocalized or gestured imitations of other species or imagined actions, for example), and even a few symbols (any performed affect display would qualify).

As with media, so with signs. Of the three basic types of medium (environment, channel, record), humanity differs from other life forms chiefly in the relative weight borne in its media by Peirce's three basic types of sign – index, icon, and symbol. Man, Burke famously asserted, is the symbolic animal, but s/he is also far more iconic an

animal than the average bear, so to speak, and as an indexical animal, no freer from culture (or nature, for that matter), than any other animal is from its "natural" environment.

Consider the perspective of Roland Barthes, famous for his lucid and accessible critiques of the objects and artifacts of popular culture. Obviously, Barthes spent much space in his landmark *Mythologies* as well as in copious columns and articles in widely circulating periodicals on a style of cultural criticism one might roughly characterize as "unmasking." However he might have explained his technique – exploring the connotations of a given verbal or visual symbol, or uncovering the political signified beneath a superficially innocuous signifier in the world of popular entertainment, or revealing a petit-bourgeois mythology passing itself off as an instinctive or supposedly "natural" manner of seeing the world – Barthes was engaged in a version of what students and teachers in the area of environmental education would call "interpretation." What a park ranger, wildlife reserve tour guide, ecotourism coordinator, or environmental educator means by "interpretation" is the careful explication of what untrained visitors from an urban or agricultural environment to a forest, wetland, or other unfamiliar ecosystem are observing in front of them. The nature interpreter turns an undifferentiated mass of foliage or expanse of barren tundra into a semiotic environment rich with meaningful signals for the uninitiated visitor.

Barthes was engaged in the same activity, but instead of reading a physical environment as a medium of communication, Barthes's media environments consisted of his human-built surroundings or the array of cultural signifiers within them. In the same manner that the nature interpreter "unmasks" the dense web of ecosystemic relationships

behind a recreational nature tourist's naïve perception that s/he is simply looking at a swamp or desert or leaves of grass, Barthes purported to explain the socio-political meaning behind apparently innocuous or merely entertaining artifacts of popular culture. Barthes was reading his cultural environment exactly as a prehistoric human read his or her physical environment, indexically. "Indexicality hinges upon association by contiguity . . . and not, as iconicity does, by likeness; nor does it rest, in the manner of a symbol, on 'intellectual operations'" (Sebeok 1995, 226). Observed artifacts of popular culture meant what their analysts and critics thought they did either intentionally or not. If intentionally, then they *symbolized* the same content to all, and criticism was superfluous; but if not, they directly revealed, or pointed to, that is, *indicated*, an underlying socio-political "deeper" reality.

As much as Barthes wrote about what the objects of his analysis connoted or represented culturally and politically, it is only if we understand such cultural interpretation as no less indexical an intellectual process than ecotourism or nature interpretation or prehistoric hunting that we can make sense of it at all. Barthes and his many successors and imitators posit as direct a causal relationship between political force and cultural expression as the environmental educator does between an efflorescent desert and an unusually active El Niño current. "Contiguity is actualized in rhetoric," Sebeok (1995) adds, without differentiating, as Barthes would not, between visual and linguistic rhetoric, "among other devices, by the trope of metonymy: the replacement of an entity by one of its indexes" (227). The index is the cultural artifact or practice under analysis, and the entity is the underlying political reality the semiotic cultural critic intends to unmask. As Jürgen Habermas (1995) puts it, "If Peirce's semiotic is applied to

this sphere, produced by human beings but by no means intentionally *controlled*, then it also becomes clear that the deciphering of implicit meaning structures, that is, the understanding of meaning, is a mode of experience" (62). The popular culture parts apparent to the naïve or untutored reader represent the political whole perceived by the semiotically trained cultural critic.

So the "argument from sign" (X means Y) is in fact a warrant, to use Toulmin's near-universal term, grounded in an index. "X means Y" must mean "X indicates Y." Neither icon nor symbol is logically interchangeable in this formulation, because if "X resembles Y" be put forth as claim, as in "The image on this security camera tape is X's face," that claim can only be supported with references to numerous indices, unless it is clear to all including X that it is X's face, in which case it is not a claim at all, but evidence in support of another claim ("X robbed Y"). Similarly, one cannot *claim* that "X symbolizes Y," for if no cultural indicators of Y can be found, an audience must consent to allow X to mean Y, in which case there is no debate, therefore no claim, therefore no argument.

The "X means Y" warrant is the logical inverse of the so-called "causal argument." One can only adhere to an indexical argument if one has already accepted the implied and necessarily causal relationship between index and referent. Now, it might seem pedestrian to spell out the explicit form of a causal argument (X has properties that give it the ability to create Y), but once one has done so, even beginning students of argumentation can sort through a great deal of cultural criticism rather swiftly. Two fictional examples: 1) The patriarchy has properties that give it the ability to generate the character of Ally McBeal; 2) Fox-TV executives have properties that give them the

ability to create a political thriller in which, roughly 24 times per day, an American hero saves lives through the practice of morally justifiable torture. The second example strikes me as entirely plausible, and perhaps you are not sure you understand what the first example could mean. But one can imagine articles based upon either one, each rich with indexical arguments from "sign", being submitted for publication or at least a term paper grade. So it is not the dualistic European semiology of Barthes's compatriot Ferdinand de Saussure that explains the fundamentally indexical critical method of Barthes and his many imitators but the triadic semiotics of the American philosopher, scientist, and logician Charles Sanders Peirce.

PEIRCE'S TRIAD

Semiotics' pioneer and most thorough theorist was Peirce and not Saussure. "Peirce … invented, almost from whole cloth, semiotics—the science of the meaning of signs" (Moore 1993, 2). As Gerard Deledalle makes explicit, "Peirce continued all his life to elaborate his theory of signs, even when he seemed to be giving his attention to other subjects . . . Saussure did not mention the subject before giving his second course of general linguistics in 1908–1909 . . . . Historically, Peirce's priority to Saussure is unquestionable" (2003, 100).

Barthes explained the theory behind his technique of observation in various ways throughout his remarkable career, but it is Peirce who can explain what Barthes accomplished at his most lucid more clearly than Saussure. Saussure's semiology described a dichotomy between signifier (acoustic icon) and signified (mental representation). Saussure's *signifier* and *signified* fused in the *sign,* an image Saussure depicted with upper- and lower- case letters S atop one another divided by a line, with the

signifier the numerator of the signified's denominator. While Saussure's sign is a vivid image of the sign as a psychological entity, it is unclear how a system of such signs relates directly to the non-psychological realm that most observers of it tend to call the real world. Certainly, Saussurean semiology inspired a voluminous production of critical theory during the 20th century, with everything from human culture to the human unconscious said at one point or another to be "structured like a language." This underscored the linguistic roots of Saussure's semiology, whereas semiotics for Peirce was a general depiction of all possible thought and representation, with logic itself described simply as "formal semiotic." In the long run, Saussure's semiology has had the same limited explanatory scope outside linguistics as information theory turned out to have beyond the field of telecommunications engineering (the perplexing ubiquity in freshman communication studies textbooks of an image derived from Shannon and Weaver's sender/receiver model notwithstanding). Even the method of cultural and social criticism inspired by Saussure is better explained, as we have seen, by Peircean semiotics.

As one of history's premier logicians (Bertrand Russell among many others called him the foremost of American thinkers), Peirce readily realized that all signs must consist not in dyadic depictions of one-to-one representations (as they seemed to have been for proto-semioticians like Galen and Augustine), but in a triadic relation among what he usually called the *representamen,* and almost always called the *object* and the *interpretant.* The representamen stands *for* something *to* something, *for* the object *to* the interpretant. Peirce's semiotic "unites the three universes of possibility, existence, and discourse" (Deledalle 2000, 49).

Marriage counselors and family communication professors are fond of the maxim that there's you, there's me, and then there's our relationship. Far more than an aspect of human communication one is enjoined to recall, the triadic nature of all entities aside from the singular (and therefore unperceived, thus pragmatically nonexistent) is logically inescapable. Even if we (you and me: the name on the first sheet of this longish text and the name on your picture ID) postulate two computers A and B cabled together it is only the cable that makes the designation of these two of the world's billion computers as A and B possible at all.

Where there are two, there must be three, and the third is the manner of connection between the one and the two. "Wherever two or more are gathered in my name, there I am," and two will suffice. Two pebbles selected at random from a beach are related once they are identified as one and two, whether the relationship is imputed as proximity, distance, similarity, difference, "my pebbles," and so forth.

Consider that object of the interpersonal communication researcher's professional life, the *dyad*. Of course, pure dyads are impossible. "The intentional relation is inherently triadic. … [D]yadic forms may be used to express the sign relation, for example, A means B or A signifies B. But they do so only when elliptical in form: A cannot mean B except *to* someone, who must interpret it as standing for B" (Mounce 2002, 24). Either one or both members of the dyad are aware of the other, in which case that awareness however labeled is the third element in the triad. Or perhaps you are (or I am) considering the so-called dyad, but if so, we are incapable of not thinking the third term, the manner in which the two are related. Or look at a pair of chairs ("pair" is our third term already): even if you insist on seeing them as a unity, they (1) are still present

(2) to you (3). Stare into the darkness, and there is still you, an impression of darkness or lightlessness, and the act of starting *at* or *into* "nothing." As Deledalle (2000) writes:

> *Pragmatically*, semiosis is then a continuous process from a representamen (R) to an immediate object (Oi) (an actual event, or a sense or meaning) through an interpretant (I) which is also a sign, as long as the object is not found. When it is found, the interpretant is no longer a sign but a final interpretant, that is to say, a *habit*—either a new habit or the reinforcement of a previous habit. (51, italics in original)

For Peirce, everything in reality (whether material or imaginary) fell into three fundamental categories: First, Second, and Third. Peirce would therefore describe a particular item as a First or Second, for example, or ascribe to it, say, Secondness or Thirdness.[1] Peirce associated Firstness with a quality of feeling, with spontaneity and indeterminacy, immediate consciousness and chance, the fresh and the new, the possible. Secondness referred to reaction, or dependence on the First, the patient to the First's agent. And Thirdness mediated First and Second. In Peirce's words:

> "The first is that whose being is simply in itself, not referring to anything nor lying behind anything. The second is that which is what it is by force of something to which it is second. The third is that which is what it is owing to things between which it mediates and which it brings into relation to each other. (c. 1890, 1.356)

Peirce was always at pains to explain that, though the interpretant could indeed be a particular human mind, it was foremost *another sign* which itself became the representamen of a subsequent triad, and so on *ad infinitum*.

> *A REPRESENTAMEN is a subject of a triadic relation TO a second, called its OBJECT, FOR a third, called its INTERPRETANT, this triadic relation being such that the REPRESENTAMEN determines its interpretant to stand in the same triadic relation to the same object for some interpretant*. (1903, 1.541, italics and uppercase letters in original)

So the theoretically complete meaning of a sign lay not in its direct correspondence to an object but to its relationship to the whole network of possible signs.[2]

In contrast to Saussure's dualistic conception of the sign, Peirce described a trichotomy among representamen, object, and interpretant, concepts simplified and popularized as the symbol, referent, and reference of the famous semantic triangle (Fig. 1) depicted in 1923 by I.A. Richards and C.K. Ogden, the latter a protégé of the Lady Welby with whom Peirce carried on a prolific intellectual correspondence during the opening years of the 20th century prior to Peirce's death just months before the start of World War One (Deledalle 87, 138). The semantic (often called "semiotic") triangle depicted a triadic relationship among symbol, reference (thought), and referent, by which was meant a real-world object or entity, and *The Meaning of Meaning* (Ogden and Richards 1923) in which it was introduced included an extensive appendix on Peirce's theory of meaning.

THOUGHT OR REFERENCE

Symbolizes
(a causal relation)

Refers to
(other causal relations)

Stands for
(an imputed relation)

SYMBOL   REFERENT
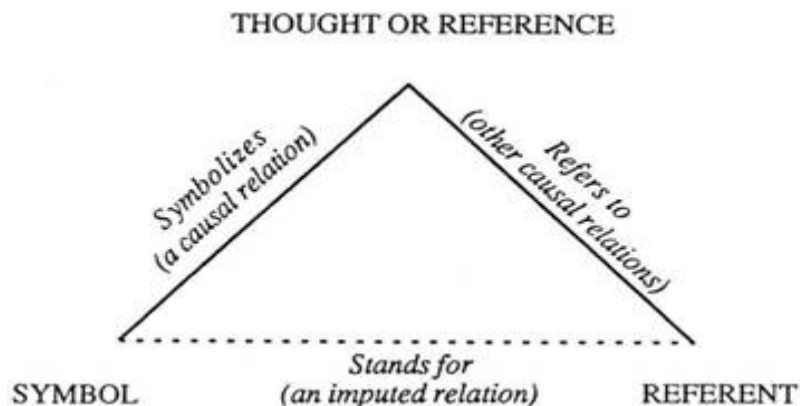
Fig. 1: The Semiotic Triangle
Source: Ogden and Richards, 1923.

Given the general conceptual overlap, from Peirce, Saussure, and Ogden and Richards, respectively, of representamen, signifier, and symbol on the one hand, and the looser fit between interpretant, signified, and reference on the other hand, the thought of Saussure and much of the vast literature he inspired lacks any sense of what Peirce called the Object brought to mind by a reality outside it and what Ogden and Richards called the *referent*. Even Barthes by himself finally conceded a half century after Ogden and

Richard's semantic triangle was introduced that "there are three things: the signifier, the signified, and the referent" (1975, 169).

In the semantic triangle, Peirce's distinction between the "dynamical object" (essentially a Kantian "thing-in-itself") that occasions the representamen *of* the "immediate object" *for* the interpretant is collapsed into the *referent*, and Peirce's interpretant is specifically located in the human mind as the "thought or reference." For Ogden and Richard's *symbol* one can of course substitute any of Peirce's tripartite classification of signs, whether icon or index, even though Peirce's representamen was fundamentally iconic, and it was his interpretant, a subsequent representamen, that one could describe as iconic, indexical, or symbolic. Even Peirce finally conceded his initial formulation was not intuitively obvious to the majority of his readers. In a 1908 letter to Lady Welby, Peirce wrote, "I define a Sign [representamen] as anything which is so determined by something else, called its Object, and so determines an effect upon a person, which effect I call its Interpretant, that the latter is thereby mediately determined by the former. My insertion of 'upon a person' is a sop to Cerberus, because I despair of making my own broader conception understood" (1977, 80-81).

Certainly, Ogden and Richards brought a lucid variant of Peircean semiotics to a large audience, expanding upon their contemporary Saussure's semiology a half century before a similar expansion was acknowledged as necessary by Barthes. Though symbol and reference corresponded quite closely with Saussure's *signifier* and *signified,* the extended line holding the two apart in the semiotic triangle is a clearer depiction of the *exteriority* of symbols, icons, and indices from the eyes, ears, and hands that bring them to the attention of thought. Sounds/Symbols/Signifiers effect mental phenomena that

104

become cognitively fused with the affects of delight, fear, hope, or pain occasioned by the referents to which the signs obliquely refer. The happily-married couple with mismatched phobias, hers for cats, his for mice, perceive the same ginger cat lurking in the backyard. They readily agree on the denotation of the text "cat" and sonic image [kat], but their visceral reaction to the sight of the same referent, horror or relief respectively, will differ in the exact proportion as do the connotations, or emotional associations, for each of "cat" in script or [kat] in speech or a photograph or video clip of a cat. This tenuous relation between symbol and referent was quickly encapsulated in the semantics pioneer Alfred Korzybski's maxim, "The map is not the territory" (1933).[3]

Not the territory for us, that is. Recall our discussion of the indexical nature of Nature. Though the same referent may function as an index (*i.e.* signal) differently to different species, it always indicates the same underlying relation to any member of a particular nonhuman species. Feces on a forest floor mean different things to fox and fly, but they always indicate the recent passage of potential lunch to the fox, and free lunch here and now to the fly. Humans not only posit various referents even for a given index, but having settled on a referent, can argue about what it might symbolize. Your local "degreed meteorologist" will not ascribe a sudden thunderstorm to the anger of the gods on the air, but could neurotically interpret his driving home in one as an allegory of his repetitive and dismal struggle through life. Human is the symbolic animal, as Kenneth Burke famously asserted, and our symbols circulate freely throughout our societies and cultures to be apprehended with varying degrees of congruence. The STOP sign, as sign, is understood in the same way almost universally, while *freedom* not only connotes, but even denotes, different things to different people, as does *Nature,* for that matter.

The connection between semiotics and media ecology should now be apparent. *We ourselves mediate referents and signs*, or objects and representamens, a relationship the semiotic triangle depicts explicitly. We not only *embody* Ogden and Richards's "reference," but comprise the only reference point that sign and referent have in common. Consider an algebraic semiotic triangle:
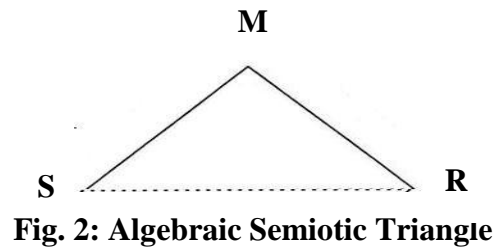
Fig. 2: Algebraic Semiotic Triangle

Symbol/sign/signifier/sound/script connects to Referent/reality/real through Mind/mediator/mentality/me. The structural relationship among S, M, and R remains stable from speaker to speaker and context to context, and while S remains fixed, M might vary radically from Marxist to capitalist or technological optimist to environmentalist. We all know "the Interstate" refers to the Interstate, but "the Interstate" connotes differently from one mind to another. A simple mirroring of the image (the semiotic diamond, perhaps – Fig. 3) depicts how two minds may agree on denotations or negotiate differing connotations of a sign with respect to the same referent.
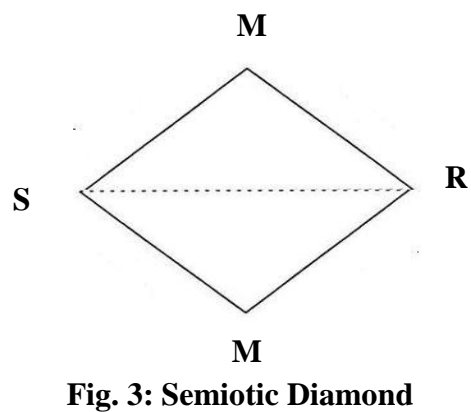
Fig. 3: Semiotic Diamond

To illustrate the use of signs in a group or even civilization, however, we need to imagine a three-dimensional figure in which a dense cluster of lines radiates like closely-packed spokes from an S character at a hub to a circle of M characters, with a perforated line drawn down from the S to the referent in which the sign is grounded. A semiotic pinwheel, if you will (Fig. 4).[4] In this concrete, "natural," if simplistic, image, the

pinwheel (daisy) is the figure, and the foliage the ground.

Were we to regard the referent flower of which this

photograph is its icon, we would see it attached by its stem

to the ground in the literal sense. That from which the sign

stems grounds the sign in what common sense calls "reality,"
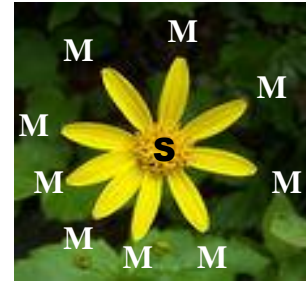
Fig. 4: Semiotic Pinwheel

Kenneth Burke's "unanswerable opponent." Now, in the

case of the text *cat* or the sound [kat], we can imagine reaching down and plucking up a

particular sensate feline and clarifying our means of mediating between sign and referent

with any number of potential interlocutors on the semiotic pinwheel. "So this is your

symbol of evil?" we ask this person or that one, "this is your mercenary in the War on

Rats? this your beloved pet? your allergen?"

So what happens when the referent transforms from cat into unicorn? When the

pinwheel flower itself is plucked from its stem and cast into the stream, when the

semiotic pinwheel is detached from its tenuous connection to its ground in reality, then

clarity or understanding is no longer, for example, the goal of Habermas's ideal speech

situation, but becomes the problem itself. What do we make of signs such as "the

homosexual movement" or "the World Trade Center conspiracy" (the "smoking tower"

theory)? With such signs, there is no misunderstanding or miscommunication

whatsoever among the many minds sharing the sign in daily discourse. The problem is

that the signs' referents do not, at least as far as evidence seems to indicate so far, exist.

Many minds remain mediators between sign and referent, but the referent is fantastical, a

figment of group (or crowd, or mob, or cultural) imagination. A semiotic theory

consisting only of signifiers and signifieds cannot address this very real problem.

Nor can a theory consisting of icons and symbols, which is why Peirce's focus on the index is so vital. Peirce referred to logic as formal semiotic because he understood that the triadic relation among symbol, reference, and referent, or among S, M, and R in my shorthand, remains invariant no matter what books, brains, or bodies they represent. We symbolic animals erect semiotic triangles as readily as spiders spin webs or beavers construct dams whether we can step into our backyard to feed (or fend off) the R or not. The difference between the paranoid schizophrenic and the Christian or Muslim, for example, is not in strength of belief or affect or in structure of thought, but in social credibility. In his or her symbolic action with others regarding referents they cannot see or hear, the schizophrenic is all alone in the world. The Christian or Muslim keeps company with hundreds of millions of co-believers.

AN INCONVENIENT TRUTH

Environmental advocates have long used a variety of signs and figures in order to convey propositions for change in the public sphere. Images produced by Greenpeace, including the notorious baby portraits and cinema verité snapshots that effectively shut down the annual harp seal hunt in eastern Canada, and the televised quixotic high seas foray against Russian whaling ships analyzed by Deluca (1999), are well-known. Representative anecdotes and photographic icons of environmental degradation are legion, and the environmental movement uses an extensive vocabulary of richly connotative symbols: the redwood tree, the panda, the Earth, the color green, and so on. Mark P. Moore (1993) lucidly explained how the spotted owl became a synecdoche for two mutually exclusive political stances toward appropriate human use of the forest in the Pacific Northwest region.

The focus of this doctoral thesis, however, is ecological rhetoric, rhetoric from an ecological perspective, and the aim of this project is to provide a partial though plausible answer to the question of what environmental communication studies can offer to a theoretical understanding of communication and rhetoric in general. So a case study pertaining to the implications of semiotics for ecological rhetoric needs to partake of the same structure of reasoning or methodological analysis one would find in ecology itself, or even in the original semiotic environment that one comprised the entire external human world. One would therefore expect an instance of environmental communication attempting to make a sustained scientific case to a non-specialist audience to be rich with indexical signs, with icons serving to depict indexical reasoning, and with symbols very much in the background. This is the pattern of argument found throughout *An Inconvenient Truth,* the 2006 Davis Guggenheim documentary of a public lecture former Vice-President Al Gore has been making in recent years about the need for public action in an era of rapid climate change, or "global warming."

There is much for a scholar of political communication, film, or media studies to explore in *An Inconvenient Truth.* First of all, Leni Riefenstahl would have been hard pressed to resurrect Al Gore's public persona more successfully than Guggenheim did. And a film taken up almost entirely by a single public speech whose speaker presents a science lecture to non-scientists through vivid visual displays of quantitative and historical information, together with animated sequences of widely varying quality and potential impact, will be of pedagogical use in argumentation, public address, and persuasive communication courses for some time to come. In this discussion, however, we will focus exclusively on the semiotic aspects of Gore's argument, and see how this

immediately seminal instance of environmental communication in the public sphere brings us a step closer to grasping the distinction between the specific type of advocacy called environmental rhetoric and the more general concept of ecological rhetoric.

Even a semiotic discussion needs to be focused sharply at the outset, especially with the highly connotative nature of many symbols familiar to eco-warriors and eco-skeptics alike. Certainly, the film is hardly bereft of symbols. In the opening scene, a film under Al Gore's voiceover of a gently flowing river seen through the branches and leaves of trees on its bank segues to "Earthrise," the first photograph of the Earth taken from outer space (on Christmas Eve of 1968 during by Apollo 8 astronauts), which appears on Gore's notebook computer in front of him while filling a wall behind him in front of a packed auditorium. "That one picture exploded in the consciousness of humankind," Gore says (Guggenheim 2006, 4:43), crediting the image with dramatic changes and the rise of the modern environmental movement.

This image would be called "iconic" by a cable-TV semiotician, and an icon it is, of course, but one freighted with so many associations it becomes a potent and polysemous symbol, not as much of a floating signifier as, say, an image of a cross or an American flag, but richly connotative nonetheless. The key in my view to the persuasive impact of Gore's argument, however, lies not in a series of emotional arguments expressed through evocative symbols, but a rational case made through a forensic series of indices. Though Gore uses icons throughout his public argument, his icons are detailed images of a carefully worked out indexical process of reasoning. The recent success of Gore's argument in the realm of public speaking, together with the concurrent success in the mode of mass communication of the same argument as the most direct and important

of the ones made by Guggenheim's film, demonstrates that even though ecological rhetoric need not necessarily pertain to environmental advocacy, such advocacy would be well served by the essentially indexical nature of ecological rhetoric.

In one of the film's best-remembered scenes, perhaps because it was later largely reenacted on an episode of *The Oprah Winfrey Show* (Dec. 5, 2006), Gore stands before a screen measuring roughly ten by thirty yards which depicts a dual line graph on a black background. An upper red line charts the amount of carbon dioxide (CO_2) in the atmosphere and a lower powder blue line charts the average annual temperature of the Earth. Both measurements, the audience has been told, were calculated from analyses of ice cores drilled in Antarctica. The Y-axis of the graph is a quantity measure, with the X-axis labeled for the time span covering the past 650,000 years. The two lines follow highly similar, often roughly parallel, paths across the time span, depicting the average temperature of the world rising and falling in tandem with the CO_2 content of the atmosphere. At the end of the red line is the current CO_2 concentration, shown to be higher than it has been over the entire time span surveyed.

In order to project the increase in atmospheric CO_2 content a half century hence, "when some of these children who are here are my age" (23:35), Gore stands on a hydraulic platform that elevates him to a height of about twenty feet above the stage as the animated upper red line rises straight up to end at a big yellow dot (23:19). Superb theater, for sure, but what is happening in terms of semiotics? Clearly, symbols, icons, and indices are involved here, but in which for the audience does the salient content lie? The convention of the line graph is so well established that even audience members with little mathematical training or memory of what little mathematical training they received

in grade school understand what is being represented when Gore simply announces what the chart means. Now, whether Gore's visual representation of quantitative information is a symbol of a table of numerals or an icon of a mental understanding on the table as a whole is of little interest except as a class discussion exercise. It is as an accumulation of indices that the image retains its persuasive influence.

Among Peirce's many accomplishments in science was in naming the process of *abduction* to rank foremost with the classical modes of reasoning long called induction and deduction. Abduction for Peirce was synonymous with imaginative hypothesis generation. Instead of deriving a rule from the results of observation (induction) or a result from applying an established rule to particular case (deduction), abduction postulates a rule, observes a result, and thereby posits that the proffered rule explains a given case, a rule/hypothesis that future induction might confirm, and from which deduction can then make predictions about the future.

So one measurement of temperature together with a measurement of atmospheric CO_2 level in one particular year would not be literally meaningless, but of little more pragmatic use alone than this year's correlation of, say, skirt hem lengths with the Dow-Jones index. If, however, through abduction, one were to imagine and then hypothesize a causal connection between the two, a subsequent series of chronological measurements allows for the hypothesis to be confirmed inductively. Prior to presenting his long graph, Gore narrates his experience as a student in a college science course taught by Roger Revelle, "who was the first person to propose measuring carbon dioxide in the Earth's atmosphere" (Gore 2006, 12:00). Gore recapitulates the entire process of abduction through induction to deduction in his historical overview of Revelle's initial findings, and

112

the annual measurements taken since then, including data gleaned through examination of ice cores drilled in the Antarctic, of CO_2 levels for years prior to 1957, when Revelle's findings were first published.

So Gore's graph is seen to derive from an instance of abduction, followed by a series of close correlations which grounds a causal argument inductively, finally allowing for scientists and public speakers to posit an argument from sign, namely, that a future rise in CO_2 levels will raise average global temperature (since "X means Y" is the logical inverse of "X has properties that give it the ability to create Y"). A deductive prediction may then follow, one which Gore performs using his entire body as a pointing device.

The key to the argument lies in the indexical nature of the long series of measurements represented (iconically or symbolically) in the graph. Once the visual display of a series of pairs of quantitative measurements establishes the existence of an indexical relationship between the elements of the pair, and the current half-century projected increase in atmospheric CO_2 level is established as an index of temperature level, Gore is able to elevate himself to the terrible height of the near-future CO_2 level, and as his audience imagines how high the average temperature must rise in tandem, he can literally indicate, with his index finger, a dark but utterly plausible future.

Between summarizing his professor's scientific method and presenting his long graph, Gore says, "and now we're beginning to see the impact in the real world" (16:23). Beginning with photographs of the snow on Kilimanjaro mountain from 1970, 2000, and "a couple months ago" (16:36). Gore shows two sets of photographs taken in Glacier National Park, 88 and 54 years apart respectively. The older photographs are packed with snow, the recent ones all but bereft of it. A 1980 photograph of the Columbia Glacier in

113

Alaska is next overlain with red lines labeled with particular years between 1980 and 2001 to indicate how rapidly the glacier's ice has receded in 21 years. "And it's a shame," Gore remarks, "'cause these glaciers are so beautiful. But those who go up to see 'em, here's what's they're seeing every day, now" (17:10). The audience is then shown a film clip of a two massive slivers of packed snow breaking away from and slowly peeling off the ice wall of a recently melting glacier and sinking slowly into the water. Gore next shows before-and-after shots from Nepal, the Italian Alps, Switzerland (two sets), Peru, and Argentina (also two sets). All depict the same stark contrast just seen in the Kilimanjaro and American photographs. "There is a message is this," Gore concludes, "and it is worldwide, and the ice has stories to tell us" (18:30).

Gore's photographs, of course, are icons in the purest sense of the term, and they are not really telling stories. More precisely, it is only because the *contrast* between the historically prior icons and the contemporary ones functions as an index of an invisible physical process that the presentation of the pairs of icons conveys any salient meaning to the audience at all. One can readily imagine an identically structured presentation of icons conveying information of little or no import: "Here is a telescopic image of the red spot of Jupiter in 1950, and here is that same spot today;" "Here is the intersection of Portage and Main Streets in Winnipeg in 1910, and here it is in 2002." There is a message here, not a narrative or a story, and the message is an index. The sets of visible icons testify to the invisible index, and therein lies their significance for the audience.

The narrative of the scientific investigation of CO_2 and temperature, together with the before-and-after icons that suggest an inductive confirmation of the hypothetical link, followed by a graph of a long series of measurements derived from physical analyses of

114

Antarctic ice, establish an indexical relationship for the audience, namely, that CO_2 increases temperature. The knowledge that CO_2 was measured in 2005 at a level higher than it has been in almost 700,000 years allows therefore for a highly plausible deductive prediction that global temperatures should also be rising now.

The final step is to inspire the audience to take action in the private and public sphere to halt or reverse the warming trend of which the current CO_2 is a positive sign (in the sense of argument from sign, therefore inverse argument from causation, therefore index). Gore's theatrical presentation of the projected rise in CO_2 levels over the next half century allows for a plausible though enthymematic concluding argument in the form of a rhetorical question followed by a value claim:

> Again, if, on the temperature side, if, if this much [literally indicating a near vertical segment of the blue temperature line about a yard in height] on the cold side is a mile of ice over our heads, what would that much [indicating the roughly 5-yard red segment depicting the rise in CO_2 since the end of the last ice age to the mid-21st century projection] on the warm side be? Ultimately, this is really not a political issue, so much as a moral issue. If we allow that [indicating the red segment] to happen, it is deeply unethical. (2006, 24:22)

There are other arguments made in *An Inconvenient Truth*, but this thirteen-minute case beginning with Prof. Revelle's research in the mid-1950s to the moral imperative quoted above encapsulates the structure of the cases which follow, each of which supports the same proposition of policy. In each case, the scientific basis for a claim of fact supported by a warrant from causation (the index) is followed by icons which make in themselves factual claims grounded in an argument from sign. Numerous clams of value follow, sometimes moral and ethical, sometimes economic and pragmatic. The need for political action and for the audience to support such action is then underscored or implied enthymematically.

So the only approach to a refutation of Gore's case in *An Inconvenient Truth* that would bear scrutiny must tangle with the thirteen-minute case outlined here. Several other propositions are put forward by the film's director, Davis Guggenheim, never directly stated, but implied in his montage of narrated incidents from Gore's private and political life and icons of Gore himself. Among these propositions are surely the following: Gore should have been elected President in 2000; Gore would have been a better President than George W. Bush; the aftermath of Hurricane Katrina in New Orleans would not have been as severe under a Gore Administration. Even if all these propositions could be soundly refuted, the case for action in the area of climate change (surely the most important of Guggenheim's propositions) would stand unsullied.

The only promising angle of refutation might lie in the fact that the future is by definition unknowable, but even from this angle, one could only plausibly dispute the speed and scope of the predicted impending change in global climate. Gore establishes beyond all reasonable doubt that climate change follows CO_2 levels, but cannot with certainty predict how quickly the one follows the other, nor delineate the precise scope of the consequences of the rise in temperatures. This is exactly why his penultimate argument is enthymematic. If a yard-long segment of this much blue line means an ice age, imagine how much catastrophe THIS MUCH red line could bring about. During the last ice age, glaciers encroached across the ancient Lake Algonquin toward the Midwest and then retreated north from the resultant Great Lakes toward Nunavut at a rate of about an inch per year. This is not a rate of change that would by analogy whip the average audience member into a frenzy of lifestyle adjustments. Of course, this is the exact refutation suggested by certain conservative commentators who interpret Gore's

argument on climate change as a purely political strategy. It is the case, however, that

Gore establishes CO_2 as an index of climate change, but allows the speed and scope of

the consequences of near-future climate change to be simply imagined as swift and

catastrophic by the audience.

In the end, though, Gore's case in *An Inconvenient Truth* will stand as a landmark

instance of ecological rhetoric. Rhetoric from an ecological perspective implies that the

advocate for a case or source of a message understand and bring an audience to

understand that, in Commoner's commonplace "everything is connected to everything

else." In a concise narrative from his private life (1:09:30), Gore relates how his family

did not "connect the dots" between his family's tobacco farming enterprise, and his

sister's subsequent death from lung cancer due to smoking. "It's just human nature to

take time to connect the dots, I know that," Gore says in voiceover narration of images of

himself looking pensively out the door of the ruin of a barn on his family's farm

(1:11:43), "but I also know that there can be a day of reckoning when you wish you had

connected the dots more quickly."

This encapsulates the motive of ecological rhetoric, to encourage an audience to

connect the dots more quickly between the visible actions of their private lives and the

invisible effects those actions can be demonstrated to have in the wider political sphere or

upon the biosphere itself. To measure Gore's recent success in this foray into ecological

rhetoric, in terms of immediate public impact of a scientific argument in popular form,

one probably needs to reach back beyond Garrett Hardin to Rachel Carson. Furthermore,

the huge popularity and media exposure granted Guggenheim's film was quickly

followed by the widely-broadcast report from the Intergovernmental Panel on Climate

Change that, with ninety percent certainty, climate change and human activity were causally linked. Not since the malfunction in the nuclear power generator at Three Mile Island immediately followed in public consciousness the vast popularity of the late-1970s paranoid political thriller *The China Syndrome* (superbly analyzed by Farrell and Goodnight 1981) has a performance in media of mass entertainment been so swiftly and decisively confirmed by what Kenneth Burke called "the unanswerable opponent," reality, "that mode of being by virtue of which the real thing is as it is, irrespectively of what any mind or any definite collection of minds may represent it to be" (Peirce 1878).

SUMMARY AND CONCLUSION: CYPRESS TREES

One might explain that the cypress trees on the coast of Louisiana have intrinsic value as living things, or that they are "cultural icons" (or more precisely, in the technical language of semiotics, symbolize traditional Louisiana culture) and merit preservation, or that they are aesthetically pleasing and enhance the quality of life of nearby residents, or that they attract visitors to the state who will part with disposable income on tours of the coast. Any of these explanations, despite their varying political and philosophical perspectives, would fall into the broad category of environmental rhetoric.

Ecological rhetoric, by contrast, would explain how the audience for the argument is directly connected to the health of the cypress trees, and how changing one's behavior with respect to a product made from felled trees can preserve one's own safety and security. Trees mulched for gardens cannot serve as a windbreak during a future hurricane or tropical storm. Therefore, the effects of future storms will be exacerbated, likely destroying any carefully mulched gardens in the storms' path as well as the homes they enclose. Homes out of a storm's reach, however, may be occupied by refugees from

118

a storm, many of whom may eventually leave the state, or its labor force, depressing the economy and raising the tax base (or depleting the public services) of many a well-gardened town. So in mulching your garden with cypress, you are participating in the near-future damage to or destruction of your own home or community. Now, one might say that one gardener cannot erode the coastline all by himself, but because neighbors take their cues from the behavior of other neighbors, your own use of the mulch will help inspire a network of households and neighborhoods to garden with the same technique and the cumulative effect of this network of gardeners will lead inexorably to disaster.

Ecological rhetoric transforms the symbolic into the indexical. The destruction of the trees might be a symbol of our vanishing coastline or dying planet. Very well, who cares? But if their destruction is a direct index of future hardship, and if I am participating in my own destruction by mulching my own flower beds with cypress, then I will mulch my garden with pine straw or pine mulch instead.

Ecological rhetoric, therefore, pertains to a pattern of argument, and not necessarily to so-called ecological issues. Adam Smith (in this instance, the pseudonym of a best-selling American economics columnist of the late 1960s through early 1980s), recalled sitting in his car in a gas station queue during the second oil shock of the 1970s, the one precipitated by the Iranian Revolution. Smith realized that in order to subsidize increasingly expensive oil, the federal government was engorging the national debt through funds borrowed from overseas, sometimes from the very nations selling us the oil. As the cars in front of and behind him in the queue were burning fuel simply waiting in line to buy more fuel, Smith realized in an epiphany, "We're writing claim checks on our country for something that we burn up in the atmosphere" (1981). This, too, is

ecological rhetoric: that sentence, and its full explanation, together with a technical explanation of what an individual auditor might do to alleviate the problem *by* himself or herself *for* himself or herself (trade one's vehicle for a smaller one, use public or non-gasoline-powered transportation, carpool, and so on). A few decades after Smith's ecological rhetoric pertaining to an *economic* danger, the fact that the fuels are being burned up *in the atmosphere* is precisely the danger to which the ecological rhetorician of today would alert his or her audience (interestingly enough, proposing many of the same solutions relevant to the problem as Smith perceived it).

Environmental rhetoric can speak of Nature as an entity outside the human realm requiring care or management or protection, but ecological rhetoric deals with specific networks connecting individual or corporate or governmental acts in the physical world with long-term effects in the biosphere, and it must explain the role of an auditor's attitude change in affecting specific behaviors that might modify those individual or corporate or governmental acts.

NOTES

[1] Summarizing Peirce puts me in mind of the Monty Python sketch in which rival fire brigades compete to see which can, in the shortest time, summarize Proust. Marty (1997) assembled seventy-six definitions of the sign in Peirce's writings, which writings run to about a hundred thousand pages, and are still in the process of being published in sequence. Though calling both *representamen* and *interpretant* types of *sign*, Peirce often used *representamen* and *sign* interchangeably. Deledalle (2000) advises, "if you want to understand Peirce's theory of signs, never read 'sign' when you see the word, but translate it either by 'representamen' or by 'semiosis.' And leave the word 'sign' to Saussure's semiology" (62). But that Peirce changed his mind and terms during a half century of research, lecturing, and writing does not vitiate his relevance a jot. One might read a representative work of a minor thinker (in the sense of "minor poet") and get the gist of the whole, but the import of a major thinker's work may be ascertained best in reading all of it and in sequence. There is at least a dissertation in the relevance of Peirce to Communication Studies, perhaps even to environmental communication in particular. So I do not propose an original reading of Peirce here, but

rather indicate how some of what are generally understood and accepted as his core ideas on signs and signification can pertain to a discussion of environmental communication and ecological rhetoric.

[2] French language versions were published in 1878 of two of Peirce's essays, one his own translation into French of an essay he wrote in English, and another he wrote in French and then translated into English himself (Deledalle 2002, 23). One wonders how Peirce might have expressed in French his insight that the understanding of a representamen arises only through the differences between one interpretant and another, the full understanding of which is perpetually deferred from one interpretant though another. He would have been delighted that the French verbs for *differ* and *defer* are collapsed into the perfect homonym *différer*, but would have been hindered in referring to a noun form of the resulting process because, though the French word *différence* hardly differs from its English counterpart, no noun corresponding to *deferral* exists in French. In English, Peirce could have coined a perfectly clear term like "differal," but in French he might have resorted to misspelling *différence,* maybe with an A in place of the second E, for example. This would likely have been clear enough to any French reader, while "differal" would have expressed this complex yet straightforward idea simply and without pretence and superfluous perplexity for generations of readers of English. But I digress.

[3] Surely the "the medium is the message" of its era.

[4] If S is a racist slur or propaganda image, a semiotic Catherine wheel might be more appropriate.

CHAPTER 5

PICTURE THIS:
ECOLOGICAL RHETORIC THROUGH QUANTITATIVE METHODS

INTRODUCTION

So the method of rhetorical criticism in chapter 2 left questions unanswered about nonlinguistic texts in all media, and the reflections on media ecology in chapter 3 in turn necessitated a discussion of semiotics in the previous chapter 4, the semiotic of an American thinker, for that matter, one as central to modern scientific methodology as to contemporary logic and a theory of signs. And yet, where has the scientific method been hiding so far in this dissertation? One could simply call this a doctoral thesis in rhetoric and dismiss the question, but a thesis that has already compared the American tradition in communication research with those of other cultures should not omit as a matter of course a research paradigm, the social science tradition, pursued by the vast majority of academics in U.S. Communication Studies. Perhaps a clue to its omission to this point, as well as to this dissertation's loosely dialectical structure, lies in this author's nationality. An American reader could plausibly chalk this essay's structure and selection of methods to a cultural predisposition. The syrup doesn't drip far from the maple tree.

Robert Babe, in *Canadian Communication Thought,* contrasts the tendency toward "effects research" (14) dominant in American communication studies with a more dialectical approach exemplified in Innis but widespread throughout a wide range of what Babe calls ten foundational thinkers in Canadian communication, among whom he includes the literary critic Northrop Frye, the Scottish-born documentary film pioneer John Grierson, and the political scientist C.B. MacPherson,. "In addition to being dialectical, holistic, and humanities, oriented, and expressing concern for ontological

122

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questions, foundational Canadian communication thought is critical in both the cultural studies and the political-economic traditions" (Babe 2000, 31-2). Babe also notes that all ten thinkers took a dual intercultural approach, in other words, both against their own mainstream culture, and in cooperation with the academic tradition of another country. "But perhaps most significantly, foundational Canadian communication thought focuses on media, or *mediation*" (32, italics in original).

This focus is reflected in the topics covered by national Canadian academic journals of communication. Though the rhetorical tradition has been sparse in Canada, an inaugural issue of a national online journal of rhetoric deviates little from the topics one might expect to find in a journal of rhetorical studies in the United States. The last fourteen years of the *Canadian Journal of Communication*, however, paints a different picture. One looks in vain for paper titles that would resonate with a regular reader of *Communication Monographs* or *Human Communication Research,* but also with subscribers to the *Quarterly Journal of Speech*. Whole issues are given over to mass communication, public policy, public control of media, journalism, broadcasting, cultural studies, media and society, minority voices in public debate, globalization, comparative media studies, and scholarly communication. We also see retrospective analyses of Innis and McLuhan, as well as attention to "local stories" of particular interest to a Canadian audience. One can discern even in this thumbnail sketch that Canadian communication studies is far closer to the approaches taken oceans away than to the culture with whom it shares most of a continent.

Canadian theory, exemplified in Innis, is also far more dialectical in approach. Babe (2000) perceives the dialectic as a negotiation between local culture versus what

Innis called empire. At the heart of empire, however, a mainstream researcher does not necessarily perceive oneself at the outside of a tradition looking in, but contributing to the development, in a "normal" way, of what most colleagues will call "knowledge." Analysts working from the center of the dominant tradition not merely of their own culture, but of a culture with global power and influence, "*need not* delve into contradiction and conflictual relations because, it is held, each person exercising his or her power contribute automatically to the 'common good'" (Babe 2000, 309, italics in original). To an extent not alien to American Communication Studies, but surely not central to it, Canadian scholarly communication research, as a study of topics in Canada's flagship journal suggest, "ask us to consider critically the communication environment in which we are immersed, and thereby begin to free ourselves from media practices not designed to promote the common good" (319).

Canadian communication theory leans noticeably toward the direction of European critical theory, and away from the more pluralistic or administrative approach seen more widely in the United States. Can one say which approach to communication theory is the more appropriate? In general terms, a theorist selects and sets out in sentences a narrow range of all possible thinkable objects, defines these objects, and delineates the logical connections among them (Woolf and Resnick 1987, 11-13). According to Littlejohn (1996), theories help us see, probe, critique, and act, but they neither reveal truth nor choose values. "Good theories are good causal arguments" (Cappella 1997, 62).

To draw an analogy from Innis's profession, economics, "Every time a person explains why some people are wealthy and others poor, he or she uses one or another

economic theory to produce that explanation" (Woolf and Resnick 1987, 4). Similarly, attribution theory describes how people draw upon naively understood psychological or implicit personality theories to account not for another's net worth but behavior. And a communication scholar may draw on a range of critical theories to analyze a literary text explicate not just oratory, but instances of print, visual, cinematic, or digital rhetoric.

To continue the economics analogy, classical and Marxian economists define identically named objects such as *value* or *commodity* differently, and often examine objects contrary theorists consider peripheral or even non-existent. "Class exploitation is a key object for Marxian theory, while most neoclassicals would deny its existence; likewise, the self-interest maximizing individual as specified in neoclassical theory would be rejected as an imaginary creation by most Marxists" (17-8). As many who have experienced marriage can attest, "[a] wife's theory about marriage when verbalized, often stuns and amazes her husband" (6), which is not to say all spouses can verbalize their theories, assuming they are conscious of them at all.

If good theories are good causal arguments, we are still left to wonder whether causation is discernible by the reductionism of classical economic theory and its intellectual analogues in the American social science tradition, or whether a micro-level event is so overdetermined, in the Marxian sense, by a multiplicity of social causes, that we can only hope to describe the communication nexus as a whole, and infer from that general picture the situation of individual actors within it. The gulf between the so-called critical and administrative traditions in communication theory is not merely political, but ontological.

One can infer from his extensive treatment of it in his textbooks a fundamental sympathy on the part of Littlejohn (1996) to the underlying investigative and emancipatory bias of critical theory, especially given his call for an extension of critical theory into the field of organizational communication, but Littlejohn finally wonders if critical theory is logically tenable. He ponders "the question of a structural versus constructional epistemology. The interest of critical theory in creating social change requires a constructionist version of society, but the need for critical theory to prove conditions requiring [*sic* – "require?"] change requires a structuralist one. This may be the ultimate contradiction of critical theory" (247).

It may be. But it isn't. Critical theory, one may assume, may well go the way of, say, scholasticism if and only if epistemology is our starting point for analysis. If epistemology is our final arbiter in the matter of theory selection, our First Philosophy, then Littlejohn's doubt is well-founded. Habermas, however, has pointed out with impeccable logic that epistemology can never become a first philosophy because any internally consistent epistemology is viciously circular (Habermas 1971, 7). The means whereby we know we have arrived at the best epistemology can only be derived through that best epistemology. So, while we may well profitably ask how we know what we know, that question can never be our starting point

We will not settle here what that first philosophy might look like, but certainly the door is open to suggest, as does the Canadian naturalist John Livingston throughout all his writing in defense of the wild, that it might resemble a visceral sense that all living beings are interconnected, and must thereby be treated by each living being with what we may loosely call fairness and justice. If so, critical theory may be Step Two, after which

126

might lie the task of quantification and what Naess (1966) called *precisization* of one's policies toward improving the world of human communication, or perhaps the biosphere enveloping it.

The American speech communication discipline began with the founding in 1914 of what is now called the National Communication Association. The rubric "speech" encompassed by mid-century several fields of inquiry (Wallace 1954) that stand alone at many institutions today in departments of Communication Studies, Mass Communication, Rhetoric, Theater, Performance Studies, and Communication Disorders. By the 1920s, American communication theory had not differentiated among different scopes or levels of communication, from the monadic to the global, but by the 1930s, an empirically-based, positivistic research tradition had arisen (Peters 1999). A.J. Ayer brought the logical positivist philosophy of the Vienna Circle, that "observational evidence that conferred a high probability on generalizations was accepted as sufficient for obtaining general knowledge" (Polkinghorne 1983, 65), to the English-speaking world in brief and accessible form in 1936, and Harry Stack Sullivan coined the term "interpersonal" two years later (Peters 1999, 24).

The Hawthorn experiments and subsequent studies of Kurt Lewin and Paul Lazarsfeld and their associates made the social science approach to communication acutely relevant to American business and industry, and by the late 1940s, Shannon and Weaver's sender-receiver model of signal transmission became a metaphor for communication in general. It appears almost universally in American introductory textbooks to this day. "In the postwar ferment about 'communication' then, two discourses were dominant: a technical one about information theory and a therapeutic one

about communication as cure and disease" (Peters 1999, 28-9). The reference here is to Rogerian psychology, and its program of dealing with communication failure, of fixing communication problems and breakdowns, but Carey (1981) sees both tendencies present in the seminal Hawthorn experiments themselves. Their major lesson, he concludes, "was the discovery of the power of communication to serve as a means of therapy in the service of social control of the worker" (77).

Thinking of the Hawthorn experiments as an encapsulation of a dual perspective on communication as a social science does not amount to the critical/administrative distinction often used to classify communication theories (Babe 2000; Littlejohn 1996), but to a question of the motive force of the communication researcher. Does the researcher embody a drive toward competition and control, or toward egalitarianism and emancipation? Were the Hawthorn results supposed to be shared with the workers, or sold to their employers?

Predating the familiar Platonic / Augustinian view of rhetoric (echoed in spirit by Hobbes, Locke and Kant among others), a thumbnail sketch of which comprises what the lay public thinks of as "rhetoric," predating the psychological tradition, begun by Aristotle and mirrored in different angles by George Campbell and his contemporaries and again by current psychoanalytic criticism, the craft of appealing to auditors' mental faculties, and predating even the so-called classical tradition exemplified by Aristotle (again) and perfected by Cicero, predating these towering shoots from the rhizome of rhetoric is the oldest of the rhetorical traditions, the school of Gorgias of Sicily, who introduced rhetoric to Athens as the gentler of the arts of making an offer one cannot refuse.

This pragmatic tradition sees rhetoric as an amoral set of *techniques,* a set of powerful *tools* capable of moving auditors toward the standpoint of the speaker. This instrumental view (whether the instruments be surgical or blunt) has been quite popular, though not universally accepted, in education, since at least the early Renaissance, foreseen, if not actively precipitated, by Peter Ramus, in the mid-sixteenth century. "Ramism…appears to lead us in the direction of 'the humanities'…as a programme of education in the arts which no longer carries with it its own guarantee that its products of necessity will be good and pious men." (Grafton and Jardine 1996, 196) From this perspective, education provides practical knowledge used for social advancement in a free economy of professionals, the stated mission of many colleges to this day.

The descendants of this pragmatic rhetorical tradition fill shelves of journals in two streams of American communication studies. One stream seeks to share research findings with a wide audience to improve the lives of its members. When pragmatic rhetoric is an egalitarian enterprise designed to uncover scientific (or at least statistically verifiable) facts about human communication that researchers publish in order to explain how unhappy utterances or practices may be replaced with happy ones, we call the approach Communication Theory. We may subdivide this approach by mode (interpersonal, small group, instructional, and so on), or by context (health communication, environmental communication, and so forth).

The other stream seeks to share findings with those willing to pay to learn how to persuade a targeted audience to behave in a manner economically or politically profitable for the communicating entity. When pragmatic rhetoric is taken as a competitive enterprise designed to provide one group with a set of persuasive techniques to be used

upon another group in order to benefit the first group, the techniques may well be uncovered and taught in departments of Marketing, Advertising, or Public Relations, and be applied in political campaigns, corporate image management, or propaganda.

The underlying sound bite of the pragmatic rhetorical tradition devolves to this: *Rhetoric works*. The young Plato agreed (in the *Gorgias*), and thereby shunned rhetoric because it did not necessarily lead to the Good. The mature Plato (in the *Phaedrus*) acknowledged that, in the right hands, rhetoric could be used to lead auditors to the Truth, a view expressed almost to the letter eight centuries later in Christian terms by Augustine. Myriad treatises on *dictamen* frequently copied by hand in the Middle Ages, and later, on stylistic figures voluminously published during the Renaissance, suggest that a public receptive to pragmatic rhetoric, to applied or readily applicable communication theory, has been ready to hand since the days of Gorgias of Sicily, and forms, to this day the dual mainstream of American communication theory.

Now, the so-called Butterfly Effect of chaos theory suggests a potentially radical objection to communication as a social science. It is possible that an experiment might so sensitively depend on its initial conditions that it might deliver different results every time someone attempted to replicate it, leading to results that are unpredictable, or unrepeatable, or ungeneralizable?

Ethnographers, in fact, anyone pursuing qualitative research, know the presence of the researcher influences the results of the research, but social science in general, as sociologist Frederick Turner (1997) suggests, in "dealing with complex two-way interactions of many complex organisms, themselves feedback systems of almost unimaginable depth and complication, has been forced to use logical and mathematical

instruments originally designed to deal with hugely simpler systems." (xxvii) The question for a researcher is not one of qualitative versus quantitative, but rather, of when to use each, or in what combination?

Recent work in political science and economics suggests that we may use quantitative, though nonlinear, methods to analyze operationalized data with great subtlety (Kiel and Elliott 1996). If human systems follow patterns that inhere in all systems, then those patterns, at least in outline, may be delineated quantitatively, perhaps accurately enough to be of great use. Moreover, such patterns do seem to exist, for the "chaos" of chaos theory refers not to randomness, but to apparent surface chaos overlaying a deep structural order.

This strikes me as far more complex an undertaking than the goal of some communication research in the mainstream American tradition. Consider the range of research into theories of message production, the literature on traits, states, and processes. How can one discern, for example, the difference between the trait of communication apprehension and shyness, or the state of communication apprehension and stage fright, and how could a researcher generalize findings in this area from a study of sophomore communication students at a large Southern university to an understanding of Japanese adults or Kazakh farmers? On the other hand, were Wal-Mart managers to perceive something called communication apprehension widespread in their greeters, they would want to learn whatever techniques had been developed to help relieve their employees and free them to do their jobs better.

No sardonic tone is intended here, just a suggestion that even areas of positivist tests of theoretical constructs may be of practical use in specific, applied circumstances.

Though the broader questions than such methods can answer are of more interest to me, we can see the value of answering small, local, focused, practical questions with a high degree of statistical certainty.

In the following extended example, "The Quantified Analogy: Comparing Two Message Design Strategies," I intend to demonstrate my cultural predilection for critically considering the communicative environment which we ourselves mediate, while giving respectful due to the methodological majority in my chosen discipline in my adopted homeland. In this example, I pose a specific, and therefore potentially answerable, research question pertaining to ecological rhetoric. In the following example, having already drawn, through qualitative methods, some general conclusions about the centrality of vicarious narrative, the embodied observer, and indexical reasoning to ecological rhetoric, I conduct a short field experiment through the use of a survey instrument on a small but representative population on the immediate effect upon readers of a message informed by an understanding of ecological rhetoric quantitatively compared with a competent instance of straightforward technical communication.

CASE STUDY: "THE QUANTIFIED ANALOGY: COMPARING TWO MESSAGE DESIGN STRATEGIES"

ABSTRACT

Participants completed one of two versions of a survey measuring their concern about coastal erosion in Louisiana. The surveys varied only in the message design of a summary paragraph of information regarding the coastal erosion issue. Respondents completing Survey 1 read a message culled from a state government press release. The Survey 2 message recast the Survey 1 message as a detailed and descriptive hypothetical scenario mathematically and logically identical to the first message. Results supported a hypothesis that respondents to the second survey would report a higher level of concern. Implications for environmental and health communication are discussed.

INTRODUCTION

Scientific government agencies, environmental organizations, and other entities charged with a public education mission operate under limited or truncated budgets for creating messages designed to arouse and sustain public awareness of specific issues. They require methods of creating low-cost, high-impact messages that message recipients will recall over the long-term.

If vivid images of hypothetical, plausible, and easily imagined situations analogous to broader challenges and problems can lead to increased awareness, concern, and attitudinal change, organizations can issue such messages in the relatively inexpensive media of print, radio, and Internet, and readers or auditors may retain such messages more readily over the long-term. This is important because messages designed to achieve short-term behavioral change will be ineffective in securing the long-term attitudinal change required to sustain interest in and support for personal action on, for example, health or environmental issues. If a recipient processes a message more fully when actively creating a mental image of its contents, then detailed images, metaphors or similes, and narratives may assist a respondent in retaining a message for longer than can abstract, numerical, and statistical information. Message recipients may be persuaded by a message more effectively if they can quickly relate it directly to recollected elements of their own lived experiences.

This study tested for participant response to an environmental issue of potential national interest, but of immediate and costly local concern. However, the results should apply also to the communication strategy of any organization or entity interested in raising public awareness on an issue for which message recipients should act in the present to forestall or bring about events in an uncertain future.

133

THEORETICAL PERSPECTIVE

Environmental Concern

        Grunig (1983) found early literature on environmental communication and public attitudes toward the environment revealed a discrepancy between the high percentage of respondents exhibiting concern over an issue such as "pollution" when asked about it directly in close-ended questions, and the low percentage who listed such issues in open-ended questions asking about important national issues. Grunig proposed a 16-fold situational model to test for constrained, routine, and fatalistic behavior patterns, as well as problem facing, for high-involvement and low-involvement publics. He found that two distinct situational publics exist for environmental communication – special-interest, high-involvement publics seeking detailed, action-oriented information, and an unconcerned, low-involvement public that supports "the environment" when doing so involves no pragmatic change in daily life or routines. Grunig concluded the unconcerned public would use a hedging strategy between self-interest and long-term resolution of highly involving environmental situations "as long as efforts are made to ease the consequences of that solution" (43).

        Ten years later, Cantrill (1993) made an explicit effort to build upon the foundation laid by Grunig. Cantrill sought to clarify and develop the approaches to environmental advocacy he synthesized through extensive interdisciplinary research. He found (as had Grunig) that "demographic analysis does not predict environmental responses reliably" (71). Furthermore, most people (including students) had a poorly integrated view of their place in the environment, trusted mainstream news media little as information sources, had a self-serving bias in reasoning about environmental issues, and were apathetic toward environmental advocacy. However, early exposure to

134

environmental issues and group affiliation strongly influences environmental behaviors. "In short, our culture, knowledge, self-centeredness, and psychologies predispose most Americans to ignore or discount much of what passed for environmental advocacy in the marketplace of ideas" (86).

<u>Message Design Strategy</u>

A decade later, a University of Kentucky research team studied persuasive strategies for anti-drug messages in order to "investigate the influence of message design on changes in attitudes, behavioral intentions, and behavior…" (Harrington, *et al*. 2003, 16). They proposed an integrated theoretical framework combining the Activation Model of Information Exposure (AMIE), which attributes message seeking value (MSV) to a recipients' need for sensation (NFS), and the Elaboration Likelihood Model (ELM), which assumes recipients' cognitive need for messages, while testing for where recipients fall on an information processing continuum. The study attempted to measure recipients' level of information processing while controlling for their optimal levels of both sensation and cognition. Results supported, for the most part, a main effects design strategy over a targeted message design strategy. "That is, where effects were found on cognitive processing and changes in attitude, behavioral intention, and behavior, they were for the message manipulation and not its interaction with individual differences" (32). The motive for conducting the Harrington study was similar to that for the study discussed in this paper: "to determine how to reach target audiences with persuasive messages that attract optimal attention and promote optimal processing in the service of behavior change" (36).

Prior to this study, research in the same vein by Stephenson and Palmgreen (2001) concluded that viewers engaged in narrative processing are also likely to be engaged in argument-related cognitive processing. The messages analyzed in the these studies, indeed all messages attempting to redefine or renegotiate message recipients' concern toward an issue, or induce an impetus to a particular action in the recipient (or in the case of drug use, non-action), follow what O'Keefe (1988) calls a Rhetorical Design Logic. This approach "makes information about the subtleties of verbal behavior constantly relevant to the process of message planning and interpretation…" (87). According to this communication system, messages help create their own context, and assist in their recipients' social construction of reality.

Previous research has suggested that messages simulating immediacy behaviors may induce more responsiveness in recipients (Waldeck, Kearney, and Plax, 2001). Further, Pryor, *et al.* (1980) suggested that, "appeals to affect should not be overlooked when the purpose of a message is primarily to inform" (47). And Morman (2000) found that an effective fear appeal focuses not only on the severity of a threat, but also the target audience's perceived susceptibility to it.

Perloff suggested that "vivid message appeals will be more influential when voters are in low political involvement" (1984, 157). If so, perhaps a vivid message appeal could also exert more influence on a reader or listener in Grunig's unconcerned, low-involvement environmental public. The language of a message need not be intense, however, that is, characterized by emotionalism and extremity, to persuade an audience. High language intensity, defined by Bowers as "the quality of language which indicates the degree to which a speaker's attitude toward a concept deviates from neutrality" (1963,

345), was not found in Bowers' study to induce any greater attitude change than low attitude concepts.

In short, we can infer from demographic and psychological factors of a message recipient neither a given level of environmental concern nor a predicted attitude change toward many issues. Further, immediate, narrative, and vivid appeals to affect, seem to increase the effectiveness of messages in general, especially for low-involvement publics, but these messages need not measure high in linguistic intensity. Following upon this discussion, the following hypothesis was advanced that the study in question was designed to test:

> H_1: A rhetorical message intended to increase its recipients' overall concern about an issue that incorporates narrative elements and descriptive analogies with a quantifiable basis will elicit a higher level of reported concern from recipients than a conventional message reporting technical quantitative information about the same issue.

METHOD

Participants

A pilot study took place involving 33 college students (18 women, 15 men) who had (unbeknownst to the author) discussed in a prior class the issue raised in the study. The pilot study yielded mixed results, suggesting a larger sample would be necessary to uncover any potential findings of significance. Participants in the full study comprised 298 undergraduate students (142 women, 156 men, freshmen through senior, average age 20. 48, age range 31). All participants were enrolled in freshman-, sophomore-, and senior-level college communication courses at two campuses of the Louisiana State University system.

Procedures

Participants were given one of two surveys titled "LA Coastline Survey," printed on both sides of a single sheet of paper. The surveys were identical in every respect except for the message style of a summary paragraph about Louisiana coastal erosion at the top of each survey's second page. The two versions of the survey were interspersed in manila envelopes distributed to survey administrators, all of whom teach or assist in teaching LSU system communication courses. Survey administrators told participants they were receiving copies of a survey one of the instructor's colleagues had asked them to give students as part of a research project in communication. In addition, the survey would take five or ten minutes to complete, and there would be no way to identify participants by reading the survey. Participants who did not wish to participate could leave the survey blank. Survey administrators included an associate professor, an assistant professor, an instructor, two course directors, and five graduate teaching assistants.

Instrumentation

The first page of each survey elicited basic demographic information: sex, college year, age, number of years living in Louisiana, Louisiana parish (county) of residence, as well as two Yes/No questions: whether the participant 1) lived in a coastal parish, and 2) considered herself or himself an environmentalist. Three questions followed (QF, QC and QW in Table 1) about participants' level of familiarity with and concern about Louisiana coastal erosion, and willingness to seek information from a state government Web site on the issue. The second page contained a summary paragraph about Louisiana coastal erosion followed by eight questions. Questions 1 and 8 restated the latter two questions

from page one (QC, QW), Question 1 logically and Question 8 literally (see Table 1).

Questions 2 through 6 posed questions about participants' level of concern given certain

hypothetical scenarios, and Question 7 asked if participants would support a permanent

1% sales tax increase to pay for a solution to the problem. Respondents answered all

questions on a seven-point Likert scale.

Table 1: Survey Questions

Variable	Page	Question
QF	1	This is my approximate level of **familiarity** with the Louisiana coastal erosion situation:
QC	1	This is my approximate level of **concern** about Louisiana coastal erosion:
QW	1	I intend to log on to www.lacoast.gov to learn more about the Louisiana coastal erosion issue.
Q1	2	After reading this message, this is my approximate level of concern about Louisiana coastal erosion
Q2	2	This is my approximate level of concern that Louisiana coastal erosion could lead to a direct personal or economic impact on my home or family
Q3	2	This is my approximate level of concern that Louisiana coastal erosion could lead to a direct personal or economic impact on my income or business
Q4	2	This is my approximate level of concern about Louisiana coastal erosion if the situation could lead to increasingly destructive hurricanes along the coast
Q5	2	This is my approximate level of concern about Louisiana coastal erosion if the situation could lead to severe damage to New Orleans within my lifetime
Q6	2	This is my approximate level of concern about Louisiana coastal erosion if the situation could lead to severe damage to New Orleans within the next five years
Q7	2	I would support a permanent sales tax increase of 1% to cover the costs of Louisiana coastal wetlands conservation and restoration
Q8	2	I intend to log on to www.lacoast.gov to learn more about the Louisiana coastal erosion situation

Though each question included the instruction to "circle one number," some

respondents circled the phrases at either end of the Likert scale, "Extremely

unconcerned" and "Extremely concerned." Such responses were coded as 1 or 7,

respectively.

Survey 1 featured a summary paragraph written in a technical but accessible style

taken directly from a Louisiana Coastal Wetlands Conservation and Restoration Task

Force press release (Message 1). The second survey restated the same information using

descriptive analogies pertaining to football fields and the capital city of Louisiana, as well

as personal income and expenses (Message 2). The images described in Message 2

contained quantifiable elements rendering the message content mathematically identical to the statistical information reported in Message 1, an approach called, for purposes of this study, the Quantified Analogy message style. In essence, the messages were designed such that, in Myers' (1940) phrasing, the metaphorical representation corresponded point by point to what was represented, and that the object chosen to represent was of equal value to the object represented. This avoided the risk "run when figures impose on entities properties they do not in fact possess or relationships that do not in fact exist." (Stelzner, 1965, 60)

In terms of O'Keefe's (1988) theory of message design processes, Message 1 lay close to a conventional message design and Message 2 to a rhetorical design. Conventional messages aim to secure in a given context a desired response in a socially-accepted appropriate manner, while rhetorical messages, more style-centered and using greater symbolic sophistication, aim to renegotiate or redefine the context. Both messages in this study can be said to have had what O'Keefe referred to as a unifunctional goal structure, in that each was written with the intent of increasing its recipient's concern about the issue it described.

<u>Messages</u>

Message 1: "Louisiana lost approximately 1,900 square miles of coastal land, primarily coastal marshes, from 1932 to 2000, roughly an area the size of the state of Delaware, and will lose an additional 700 square miles, about equal to the size of the greater Washington, D.C./Baltimore area, over the next 50 years. Land loss rates have been reduced from 39 square miles per year between 1956 and 1978 to 24 square miles per year from 1990 to 2000. For the entire period, the loss rate has been 34 square miles

per year. That means by 2050 one third of coastal Louisiana will have vanished into the Gulf of Mexico. Restoring the state's coast is estimated to cost $14 billion over the next 40 years. The estimated cost of inaction will amount to more than $100 billion in infrastructure alone. About half of Louisiana's 4.5 million people live in coastal parishes. Without wetlands to buffer storms both people and property are at risk."

Message 2: "Imagine standing on the 50-yard line of a football field and looking toward the goal posts. Picture seawater flooding into the end zone. Imagine watching it rise until it reaches the goal posts. That area of Louisiana's coastline vanished since you started this survey. By the time you finish this page, the water will reach the 30-yard line. The field will be underwater five minutes before the end of class. If you are a senior, an area the size of Baton Rouge sunk since you started college. If you are a sophomore, an area the size of East Baton Rouge Parish vanished during your lifetime. Over the next 40 years, if every person living in a Louisiana coastal parish paid in full, without government assistance, the cost of slowing the rate of coastal erosion, it would cost about 43 cents a day. But to cover the long-term cost of inaction in business losses and hurricane damage would take $1121.07 a year throughout their whole working lives."

Table 2 displays readability statistics for each message:

Table 2: Readability Statistics

	Message 1	*Message 2*
Word count	162	166
Number of sentences	8	10
Words per sentence	20.2	16.8
Characters per word	4.6	4.5
Passive voice sentences	2	None
Flesch Reading Ease	41.1	61.3
Flesch-Kincaid Reading Level	12	8.8

<u>Calculations</u>

The descriptions of the quantifiable elements of the Message 2 text derive from the following arithmetic calculations:

LA has lost 24 mi^2 of coastline annually between 1990 and 2000, 39 mi^2 annually between 1956 and 1978, and 34 mi^2 on average between 1956 and 2000.

1. One mi^2 = 640 acres

2. 640 acres x 24 mi^2 = 15,360 acres lost annually

3. 15360 / 365 days = 42.08 acres lost daily

4. 1 / 42.08 x (24 hours x 60 minutes) = 34.22

5. 1 acre is lost every 34.22 minutes.

One derives the statistic that LA loses an acre every 24 minutes (displayed in an animated graphic on the LA Coast website) when substituting the *overall* average of 34 mi^2 in step 2.

1. One acre = 43560 ft^2.

2. A football field measures 120 yards [360 ft] x 160 ft = 57600 ft^2.

3. 57600 / 43560 = 1.322 acres

4. 1.322 x 34.22 minutes = 45.24 ≈ 45 minutes

5. LA loses one football field every ¾ hour.

Therefore, LA loses 1/9 of a football field every 5 minutes, or 120/9 = 13.33 yards when seen from the perspective of an imaginary player standing on the 50-yard line looking into the end zone. The end zone measures 10 yards, leading to the idea of losing the whole field to the 30-yard line during the time taken to complete the survey. (5 minutes x 3 = 15 minutes; 13.33 x 3 = 40 = 10 yards end zone + 30 yards.)

Baton Rouge area = 76.231 mi^2 = 48,787.84 acres

East Baton Rouge Parish area = 472.1 mi^2 = 350,009 acres

76 mi^2 / 24 mi^2 per year = 3.167 years = 3 years, 2 months

472 mi^2 / 24 mi^2 per year = 19.667 years = 19 years, 8 months

RESULTS

Combining the mean responses of Questions 1 through 8 allowed for the derivation of an aggregate level of concern. A reliability test on Questions 1 through 8 showed high inter-item correlation with a Cronbach alpha of 0.88.

Paired-samples t-tests compared the logically identical variables QC and Q1, as well as the literally identical QW and Q8. The mean response of each rose by 0.78 (Pair 1 $t = -10.478$, Pair 2 $t = -10.153$; df for both pairs = 297, $p < 0.001$ for both). To compare the effect of Message 2 to that of Message 1, an independent samples t-test compared the mean aggregate reported concern of Survey 1 and Survey 2 respondents. A significant difference was found ($t = -2.028$, df = 296, $p = 0.022$), with Survey 2 respondents reporting a higher level of concern. The range for all questions was 6.

Several ANOVAs tested for main and interaction effects to determine whether any of the nominal values indicating self-reported demographic information (survey site, gender, living in a coastal parish, or describing oneself as an environmentalist) influenced the reported difference in concern between Surveys 1 and 2. A cross-tabulation of gender and environmentalism revealed that roughly equal proportions of men and women self-reported as environmentalists. Univariate analyses of variance indicated small but significant main effects for higher levels of concern on the part of women, environmentalists, respondents living in coastal parishes, and respondents from a region struck by a hurricane two years ago. No significant interaction effects were found.

DISCUSSION

The results of this study warrant the application of the Quantified Analogy message style exemplified in this study to communicative contexts or rhetorical situations where a need is perceived on the part of message senders to increase overall concern about an issue on the part of message recipients. Clearly, this method may be profitably adapted to environmental communication, but it may be of considerable use in any situation wherein one desires message recipients to act in the present to forestall or bring about events in an uncertain future, as is the case, for example, in much health communication.

Results do not indicate, however, any need to abandon the straightforward, conventional, technical reporting style exemplified in this study's Message 1. After all, that style alone raised reported concern by more than the difference between the mean aggregate concern reported for Message 2 over Message 1. However, the difference between the two levels of concern attributable to the Quantitative Analogy message style alone, though numerically small, was statistically significant. This indicates that this rhetorical, narrative, vivid, but strictly quantified approach to message style works at least as well as and possibly slightly better than the straightforward, technical approach. Environmental organizations should adopt this approach at least as an adjunct to currently used effective approaches, and certainly add it to any preferred list of message strategies.

Moreover, this study did not confine itself to freshman or sophomore students of communication, but selected, in roughly equal proportions, from students enrolled in all four undergraduate years and in numerous programs of study. In addition, the survey was administered at an urban campus attracting students from all over the region and country, and at a second site located in a rural community attended largely by state residents.

144

Furthermore, several students at the urban site and many more at the second site were of non-traditional college age, so this survey sampled a wider cross-section of the population potentially affected by the issue in question than several college-based communication research studies have done. Therefore, the results should not be considered relevant only to one particular context or demographic group.

In particular, though women accounted for more of the increase in levels of concern, we should not conclude from so small an increase in overall means that the Quantified Analogy message strategy is more effective with women respondents than with men. Further, we should not be surprised to find part of the increase in reported concern attributable to participants who consider themselves environmentalists, who live nearer the environmental problem at issue, and attend university in an area recently affected by climatic conditions theoretically connected to the issue.

We cannot infer from the results of this study the regional, national, or global level of concern about the particular environmental issue discussed in this study. However, the methods of message design examined here should apply with equal force to any population that one might reasonably expect a given issue would influence or affect. For example, we might expect the population of Montana, and to some extent that of the Pacific Northwest region, to respond in a similar fashion in a study analogous to this one designed to measure levels of concern about long-term toxic exposure in Libby, Montana (Schwarze 2003).

After noting the results of this study, two areas for further research present themselves. One could attempt to replicate the results of this study either in other regions facing a particular environmental problem, or with a population potentially facing a

particular health or wellness issue. In addition, one might incorporate in such a future study a third group of participants administered a third survey in which the message style adhered to a journalistic or creative non-fiction style with no quantitative element at all.

The quantitative analogy message style exemplified in this study should prove to become a useful and effective applied communication strategy. A wide range of organizations or public communication entities dedicated to raising public concern on a variety of important issues should consider adding it to their current rosters of effective message design strategies.

CONCLUSION

Proponents of linear academic discourse should be able to trace the line of argument to this point in retrospect, even if they had preferred to foresee it in advance. The visual metaphor for the approach to scholarly prose herein is certainly not the line or ruler, but neither is it, despite this essay's title, that concept beloved of post-structural theorists, the rhizome, which spreads in all directions, sending its shoots of meaning above ground willy-nilly whither it will. Instead, this doctoral thesis should be seen as a *network* of methods connected to a single hub, the concept of ecological rhetoric, and it is to networks we turn next, and last, in order to ponder about how the concept and image of the network may reveal points of connection between ecological and environmental rhetoric, environmental communication research and Communication Studies, science to social science, and perhaps even the traditional rhetorical subject to the supposedly decentered one debated in contemporary rhetorical theory.

LA Coastline Survey

I am ☐ Female ☐ Male

I am a ☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior ☐ Other   Age: _____

Years I have lived in Louisiana (write fraction or decimal if less than 1 year): _____

I ☐ live on ☐ don't live on the Louisiana coast.

LA parish of residence: _____

I ☐ would ☐ would not consider myself an "environmentalist."

This is my approximate level of familiarity with the Louisiana coastal erosion situation (circle one number):

Never heard of it   1   2   3   4   5   6   7   Understand it in detail

This is how I would describe my level of concern about Louisiana coastal erosion (circle one number):

Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

I intend to log on to www.lacoast.gov to learn more about the Louisiana coastal erosion issue (circle one number).

Not at all   1   2   3   4   5   6   7   Definitely

Please turn this page over, read the information at the top of the page, and answer the questions.

[page 2, Message 1]

Louisiana lost approximately 1,900 square miles of coastal land, primarily coastal marshes, from 1932 to 2000, roughly an area the size of the state of Delaware, and will lose an additional 700 square miles, about equal to the size of the greater Washington, D.C./Baltimore area, over the next 50 years. Land loss rates have been reduced from 39 square miles per year between 1956 and 1978 to 24 square miles per year from 1990 to 2000. For the entire period, the loss rate has been 34 square miles per year. That means by 2050 one third of coastal Louisiana will have vanished into the Gulf of Mexico. Restoring the state's coast is estimated to cost $14 billion over the next 40 years. The estimated cost of inaction will amount to more than $100 billion in infrastructure alone. About half of Louisiana's 4.5 million people live in coastal parishes. Without wetlands to buffer storms both people and property are at risk.

After reading this message, this is how I would describe my level of concern about Louisiana coastal erosion (circle one number):

   Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is a measure of my concern that Louisiana coastal erosion could lead to a direct personal or economic impact on my home or family (circle one number):

   Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is a measure of my concern that Louisiana coastal erosion could lead to a direct personal or economic impact on my income or business (circle one number):

   Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is how I would describe my level of concern about Louisiana coastal erosion if the situation could lead to increasingly destructive hurricanes along the coast (circle one number):

   Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is how I would describe my level of concern about Louisiana coastal erosion if the situation could lead to severe damage to New Orleans within my lifetime (circle one number):

   Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is how I would describe my level of concern about Louisiana coastal erosion if the situation could lead to severe damage to New Orleans within the next five years (circle one number):

   Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

I would support a permanent sales tax increase of 1% to cover the costs of Louisiana coastal wetlands conservation and restoration (circle one number).

                Not at all   1   2   3   4   5   6   7   Definitely

I intend to log on to www.lacoast.gov to learn more about the Louisiana coastal erosion situation (circle one number).

                Not at all   1   2   3   4   5   6   7   Definitely

[page 2, Message 2]

Imagine standing on the 50-yard line of a football field and looking toward the goal posts. Picture seawater flooding into the end zone. Imagine watching it rise until it reaches the goal posts. That area of Louisiana's coastline vanished since you started this survey. By the time you finish this page, the water will reach the 30-yard line. The field will be underwater five minutes before the end of class. If you are a senior, an area the size of Baton Rouge sunk since you started college. If you are a sophomore, an area the size of East Baton Rouge Parish vanished during your lifetime. Over the next 40 years, if every person living in a Louisiana coastal parish paid in full, without government assistance, the cost of slowing the rate of coastal erosion, it would cost about 43 cents a day. But to cover the long-term cost of inaction in business losses and hurricane damage would take $1121.07 a year throughout their whole working lives.

After reading this message, this is how I would describe my level of concern about Louisiana coastal erosion (circle one number):

Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is a measure of my concern that Louisiana coastal erosion could lead to a direct personal or economic impact on my home or family (circle one number):

Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is a measure of my concern that Louisiana coastal erosion could lead to a direct personal or economic impact on my income or business (circle one number):

Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is how I would describe my level of concern about Louisiana coastal erosion if the situation could lead to increasingly destructive hurricanes along the coast (circle one number):

Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is how I would describe my level of concern about Louisiana coastal erosion if the situation could lead to severe damage to New Orleans within my lifetime (circle one number):

Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

This is how I would describe my level of concern about Louisiana coastal erosion if the situation could lead to severe damage to New Orleans within the next five years (circle one number):

Completely unconcerned 1   2   3   4   5   6   7   Extremely concerned

I would support a permanent sales tax increase of 1% to cover the costs of Louisiana coastal wetlands conservation and restoration (circle one number):

Not at all   1   2   3   4   5   6   7   Definitely

I intend to log on to www.lacoast.gov to learn more about the Louisiana coastal erosion situation (circle one number).

Not at all   1   2   3   4   5   6   7   Definitely

CHAPTER 6

ONLY CONNECT:
ECOLOGICAL RHETORIC THROUGH NETWORK SCIENCE

So ecological rhetoric is characterized in part by thought experiments, vicarious narrative, a material perspective on mediation, indexicality, and according to one brief quantitative check, seems to "work" as well as technical exposition. Venn diagrams labeled *environmental rhetoric* and *environmental communication* will by definition always intersect, and sometimes occupy the same space. To find ecological rhetoric intersecting with environmental rhetoric and environmental communication would be utterly unremarkable, but not at all necessary. Analogous to the media ecology perspective on media, the crux of ecological rhetoric is its ecological perspective, and not specific content pertaining to environmental issues.

Like ecology itself, ecological rhetoric understands environment, observer, agent, audience, and communication as participating in a single material network, albeit one of perhaps ungraspable complexity. Everything gleaned so far about ecological rhetoric from the foregoing discussions of Garret Hardin's landmark essay, the Interstate, and *An Inconvenient Truth*, as well as the theoretical reflections necessarily prior to the analyses (more extensive as we explored further from traditional rhetorical criticism), clusters around a single node: a material network connecting source/speaker/agent, context/environment/*kairos*, and receiver/audience/purpose. Ecological rhetoric not only requests appropriate decision makers to adhere to a proposition, but attempts to underscore how all participants in a communicative act are connected to the content of a persuasive appeal and the context out of which all are embedded.

Garret Hardin tried to accomplish this through thought experiment and vicarious narrative, as did the early 1970s energy conservation campaign, with its ubiquitous slogan, "If you're not part of the solution, you're part of the problem." The analysis of the Interstate extended a rhetorical critique informed by the media ecology tradition beyond a list of cultural observations to a first-hand report of how the Interstate can be experienced viscerally. The foundational argument in the Al Gore presentation documented in *An Inconvenient Truth* relied not on richly connotative symbols and icons but on a tightly woven series of links establishing an indexical connection between a series of measurements of a pair of physical phenomena. In all cases, the connection between audience understanding and environmental consequence was materialistic and detailed.

The concept of the network underlies ecology, environmental communication, and ecological rhetoric, so we need to explore what it is that those who study networks as such believe them to be. To arrive at network science, we must first look at complexity theory, a successor to chaos theory, itself a special case of general system theory, to which we turn now.

<div align="center">CHAOS TO ORDER</div>

Bertalanffy and Butterflies

Ludwig von Bertalanffy established general system theory (GST) in a series of papers published between 1950 and 1969, though he had articulated its fundamental principles by 1940 (Bertalanffy 1969). For Bertalanffy, the elements of a system, "defined as a set of elements standing in interrelations" (1969, 55), may vary in number, species, or pattern of interrelationship. However, a system's "constitutive characteristics

are not explainable from the characteristics of isolated parts. The characteristics of the complex, therefore, compared to those of the elements, appear as 'new' or 'emergent'" (55). The whole is not merely "more than the sum of its parts;" it belongs to a qualitatively different category.

Bertalanffy demonstrated the basic tenets of GST by varying the initial inputs of a series of simultaneous differential equations. Depending upon the initial inputs, the system of equations would display different processes. Some systems reached a numerical node and then retracted from it, and some cycled repeatedly. Others, when charted graphically, created a loop image, while some illustrated patterns of growth or decay, some oscillated regularly, and others irregularly. In general, Bertalanffy found a system would stabilize, fail to stabilize, or oscillate. Some systems would even exhibit apparently teleological properties. Bertalanffy asserted he had laid the foundation for understanding systems in general, abstracted from the context in which they resided (biological, social, mathematical, and so forth), and declared several concepts previously considered metaphysical "accessible to exact formulation" (Bertalanffy 1969, 86).

By the early 1960s, Bertalanffy was lecturing about the application of GST to biology, psychology, and psychiatry. Meanwhile, the meteorologist Edward Lorenz was attempting to create computerized graphic models of weather patterns. One afternoon, after restarting a particularly intriguing projection by entering its initial value from an earlier printout, Lorenz saw the output vary distinctly from that of the previous run. Lorenz realized that the column widths of the printout had truncated the original value 0.506127 to 0.506. "By changing the initial conditions, (that is, by omitting the information contained in the digits 0.000127), he effected a drastic change in the weather

152

pattern" (Bütz 1997, 6). Lorenz "was surprised to find that the discrepancy occurred *gradually:* First in the least significant decimal place…and so on. Moreover… [t]he difference between the original and restarted trajectories approximately doubled in size every four simulated days" (Alligood 1996, 360).

Like Bertalanffy, Lorenz explained his system's behavior by way of a series of differential equations. "Solutions of these equations can be identified with trajectories in phase space [a multidimensional diagram that graphically depicts the behavior of a system through time]. For those systems with bounded solutions, … nonperiodic solutions are ordinarily unstable with respect to small modifications, so that slightly differing initial states can evolve into considerably different states" (Lorenz 1963, 130).

Lorenz's discovery of the systems property he called "sensitive dependence on initial conditions" has become known, in part through his own lectures, as "the Butterfly Effect." This refers to more than the familiar image of a Brazilian butterfly flapping its wings and ultimately setting off a tornado in Texas. Disseminators of this image often seem to forget that for every butterfly setting off a storm, we may imagine another butterfly stopping one. Moreover, there are quite a lot of butterflies out there. The Butterfly Effect "refers to the property that pairs of points, which begin as close together as desired, will eventually move apart" (Alligood 1996, 26). In other words, simple deterministic systems can produce the appearance of random behavior that, though finely structured, looks in any particular local area, like noise (Gleick 1987).

Chaos theory would seem to imply that we should feel no less modest about the prospect of describing the human communicative world with precision (let alone about our predicting or controlling it) than did thinkers like Jacques Lacan or Richard Feynman

about attaining certain knowledge in psychoanalysis or physics. On the other hand,

"Lorenz had found unpredictability, but he had also found pattern" (Gleick 1987, 44).

Complexity

So the "chaos" of chaos theory refers not to sheer randomness, but to apparent

surface chaos overlaying a deep structural order. Nicolis and Prigogine (1989) refer to a

pair of antagonistic manifestations they label short-scale randomness and long-range

order. "A chaotic system could be stable if its particular brand of irregularity persisted in

the face of small irregularities" (Gleick 1987, 48). Who cannot recall a particular

relationship, or person, when reading that sentence? At the edge of chaos lies

complexity, wherein many of us doubtless sense we spend much of our time in human

communication. "Our everyday experience teaches us that adaptability and plasticity of

behavior, two basic features of nonlinear dynamic systems capable of performing

transitions in far-from equilibrium conditions, rank among the most important

characteristics of human societies" (Nicolis and Prigogine 1989, 238). Complexity refers

to "the ability to switch between different modes of behavior as environmental conditions

are varied" (218).

In short, "self-organization depends on self-reinforcement: tendency for small

effects to become magnified when conditions are right" (Waldrop 1992, 34). What

happens, in the language of one economist drawn to complexity theory, if you have not

the negative diminishing returns of classical economic theory (e.g. that fourth 25¢ Big

Mac isn't worth even 25¢ to you after you ate the first three), but *positive* returns?

Furthermore, once the system has achieved its new pattern of organization, it does

not spontaneously organize, as Waldrop explains (1992), it becomes "locked in." For

example, once market conditions allowed the VHS videocassette system to attain an edge over the technically superior Betamax system, the inferior VHS system remained locked in until the DVD era. Some have suggested that Microsoft dominates the current market for business software application not because they manufacture the best operating system, but because they do not. Only Microsoft can create software capable of interfacing with its technically complex, unwieldy, and confidentially coded series of Windows brand operating systems.

A North American historical example illustrates what Waldrop (1992) called the complexity theory notions of "increasing returns, lock-in, unpredictability" (37). Between 1960 and 1966, Québec transformed itself, seemingly overnight, from a Catholic, agrarian, traditional society dominated by a system of clergy, government officials, anlgophone corporations, and wealthy francophones into a liberal, secular, industrial state with a burgeoning separatist movement. Historians have ever called so rapid a series of changes in peacetime the Quiet Revolution. Clearly, the social conditions for such a change had been brewing for decades, but the death of a man who had been premier of Quebec since the year Huey Long was shot, in a sociologically youthful culture (the Baby Boom ran deeper and longer in Canada than in the United States), provided the final impetus to an irreversible reorganization.

The link between complexity theory and rhetorical criticism should be evident. Criticism often describes how a text or performance thereof (whether linguistic or visual), can be ascribed an intent from an imputed source to incite the formation of new stable systems (whether of attitudes, ideas, values) in the consciousness of an audience of whatever size, or to entice a disparate cloud of memories and sense impressions to

coalesce out of chaos into a coherent ideology, value cluster, or simple adherence to a specific proposition offered for consent (in Perelman's terms). On the other hand, criticism can explain how the purpose of an agent's rhetorical act may be to destabilize or disperse a less stable ideology or adherence or value cluster, to induce chaos or at least unpredictability, or to maintain or repair the weakly-connected stability of an established system, or prevent its imminent dissolution.

Why do some fads and phrases disseminate rapidly throughout a culture (fanny packs, "mother of all battles"), whereas others die on the vine (butterfly wing car doors, "secondary virginity")? Malcolm Gladwell proposes that some messages, trends, fads, and ideas approach and then surpass what he calls a "tipping point" (2000). I read this now-famous term as a direct analogy to complexity theory, in which a complex system on the edge of chaos, at a specific attained point, spontaneously self-organizes into a new order rather than disintegrating into pure randomness. If true, this idea, and by implication, the entire fields of complexity and networks, could have direct relevance to scholars of rhetoric, as well as researchers in communication theory and performance. Fortunately, as Buchanan (2002) makes explicit, the idea *is* true:

> [E]ven though we know…perhaps next to nothing at all about the psychology and sociology of ideas, mathematical physics guarantees that there is a tipping point. It is not often that mathematics applies with such power and certainty to social phenomena. The basic idea of the tipping point is not even debatable. No one knows the rules by which ideas spread from mind to mind…what makes one idea stick and another not, or…who plays the biggest roles in spreading ideas, or what kinds…. But all these issues have no effect whatsoever on the *existence* of a tipping point. (168)

And it is this tipping point that links complexity theory to what Albert-László Barabási (2002, 8) called "the new science of networks."

<u>Networks</u>

John Guare's adaptation of his 1990 play into the Fred Schepisi film *Six Degrees of Separation* (1993) brought a core insight of network science into popular awareness. Guare's character Ousa ruminates that she read somewhere that we are all separated by six degrees of separation. She was perhaps rounding up the outcome of the 1967 Stanley Milgram study in which a randomly selected group of people in Omaha were asked to convey a letter to a Boston lawyer by mailing the letter to someone they thought might know him. Most of the letters arrived at the target destination in a median of 5.5 steps. An intuitive sense that only a short chain of intermediaries connects us to any particular person mathematician Duncan Watts (1999) calls the *small-world phenomenon.*

This may still feel like a strange result, though. After all, many people (students certainly) conflate their perception of public opinion with the results of an imaginary straw poll of most people they know. Others of us suffer from a variant of what advertising executives once called "the Martini effect," an early Madison Avenue reference to clients who balked at broadcasting a commercial during the hour when everyone was having their pre-dinner Martini – everyone, of course, being everyone the clients knew, associated with, worked with, attended the same clubs and schools with, and so forth (Straiton 1985).

Milgram's study surely underestimated the effects of class and profession on the number of degrees of separation he discovered. However, most clusters contain at least one person with a connection to someone in at least one other cluster, and some people find themselves very richly connected to many clusters and other equally richly connected people. Watts discovered that only a literal handful of random, long-distance,

157

weak links between otherwise adjacent clusters precipitates a sharp, exponential decline in the number of links necessary to pass from any given node on the global human network to any other node (1999). Herein lies the so-called "strength of weak ties," (Granovetter 1973), the magic of "working the room" (RoAne 2000).

In 1999, Barabási and his colleagues published a summary of their initial mapping of the World Wide Web. They found that the structure of the Web follows a power law distribution, and that "real networks are governed by two laws: *growth* and *preferential attachment*" (Barabási 2003, 86). For example, thousands of sites contain a hyperlink to Google, but very few, if any, sites contain a hyperlink to any particular personal Web page. The Web grows one node at a time, but if the administrator of a new node is going to connect to another node, he or she will prefer to attach to one of the more richly-connected nodes online, rather than a Web site managed by, say, me, if I had one, or you. So the rich get richer.

Moreover, the more people one knows now, the easier it becomes for one to make new connections faster. Connections lead to more connectivity – in graph theory, on the Internet – at conferences. The well-known 80/20 Rule (in which 20% of the X accomplishes 80% of the Y) holds true for all networks. The number of connections per network node follows not a traditional bell curve, but a curve representing a power law distribution.

The upper left portion of a power law curve (Fig. 5) graphically depicts a small value of a dependent variable X (academics, law firms, sexually active people) possessing a relatively large quantity of an independent variable Y (co-authors, clients, sexual partners).
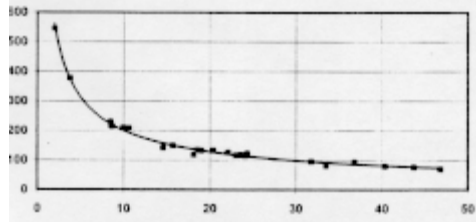
Fig. 5: Example of a power law curve
Source: Infrastructure Technology Institute, 2005

The lower right side of the curve charts the far larger number of the variable represented along the X-axis in possession of relatively little of whatever the variable charted along the Y-axis represents (Barabási 2003). Networks in general and the Internet in particular display small-world properties, but they are also scale-free. This means that relatively few network nodes possess vastly more connections than almost all others. Only a small number of links may separate any particular node from any other, but finding that series of links may take a great deal of time.

Through the technology of packet switching, in which network routers break a digital message into packets – rigidly formatted strings of zeros and ones representing a code which instructs subsequent routers where to send the packets and how to reassemble them – while imposing no limit on the choice of route taken by the packets, a network may still function when one of its nodes goes dark (whether due to power failure or aerial bombardment). Today's Internet, however, developed exactly as the physicists, computer scientists, and mathematicians clustering around the new science of networks predict any network will develop anywhere: as a web wherein most nodes remain no better connected than the average voter, and a few nodes become more richly connected than Armand Hammer or Vernon Jordan (Barabási 2003).

SUPPOSING YOU TO BE A NETWORK – WHAT THEN?

Rhetorical theorists have devoted much careful thought recently to the question of how we ought to understand the concept of *agency*. As Carruth summarized the problem, "If we refer to Burke's pentad as one model in which to situate agency rhetorically, then, 'act,' 'scene,' 'agent' and 'purpose' seem to cause much less trouble than … 'agency'" (2003). What distinguishes the last term from the others? All are nouns, and they answer, in turn, the questions what? where? who? why? how? One can answer, at least provisionally, the first three questions in any given situation through information available to the senses, or in the historical record. Moreover, even if we consider determining an agent's purpose (even when he or she articulates it for us), in the final analysis, extremely difficult, we disagree little on what we mean by "purpose."

On the other hand, the question "How?" drives virtually the whole of contemporary scientific activity. "What's the route?" we asked earlier. In addition, the How refers to *processes* rather than discrete actions, places, bodies, or stated reasons, processes whose workings often appear inscrutable.

Rhetoric and communication theorists need to direct attention to recent discoveries in network science. After all, network scientists study, and believe they have come a significant distance in the past decade in clarifying, the processes whereby discrete entities establish and reinforce connections with one another. The patterns uncovered to date appear to hold true whether the connected entities are biological, mechanical, mathematically abstract, or by logical implication, rhetorical. I believe we may derive from network science, if only as a working hypothesis or organizing metaphor, insight into the nature of rhetorical agency.

Consider the physical system necessary to develop any possible workable conception of rhetorical agency, the rhetor's brain. Buchanan (2002) summarizes the current paradigm of the structure of the human brain as follows:

> A region of the human brain contains as many neurons as there are people in the United States. In the crudest picture, each neuron is a single cell with a central body from which issue numerous fibers. The shortest of these, known as *dendrites*, are the neuron's receiving channels, while the longer fibers, known as *axons*, are its transmission lines. The axons running away from any neuron eventually link up with the dendrites of other neurons, providing communicating links. … By a long shot, most of the neurons link up with others nearby, within the same functional region, for example, be it the hippocampus or Broca's area. … However, the brain also has a number of truly long-distance axons that link brain regions that lie far apart, sometimes even on opposite sides of the brain. Consequently, we have many local links, and a few long-distance links, something that begins to sound like the small-world pattern. (64)

So what accounts for the curious fact that this particular small-world network has attained awareness of itself and some capacity to modify itself, for better or worse? The biologist Franciso Varela summarized much of his work on the strange phenomenon of self-awareness in an anthology of interviews with scientists its editor sees as taking the place of traditional intellectuals in explaining the meaning of our current world and selves (Brockman, 1995). Varela writes, "Organisms have to be understood as a mesh of virtual selves. I don't have one identity, I have a bricolage of various identities…that manifest in different modes of interaction" (1995, 211). Sometimes our situation is on stage, sometimes backstage, as Goffman put it. Varela continues:

> I see the mind as an emergent property, and the very important and interesting consequence of this emergent property is our own sense of self. My sense of self exists because it gives me an interface with the world. … An emergent property, which is produced by an underlying network, is a coherent condition that allows the system in which it exists to interface at that level. (215-6)

Commenting upon this interview, though without recourse to network science, which would make his analogy even stronger, Žižek (1999) writes that "The 'subject' emerges when the 'membrane', the surface which delimits the Inside from the Outside, instead of being just a passive medium of their interaction, starts to function as their active mediator" (312). So if the human brain is a network of networks, then what we perceive as the self may itself comprise an autonomous network grounded in a given system of connections and nodes among the neurons of the brain.

Consider the possibility, even as a generative metaphor, that the rhetorical agent is in fact a physically autonomous network. Such an agent would also be a potential node for other like networks, growing in connective strength as it linked inward to nodes in its preconscious, and linked outward to other such networked selves in the social and political world. It may meditate within to achieve, for example, the peace of the practicing Buddhist or the joy of the Spinozan wise man, and mediate without to reach others in some program of social and political praxis.

Let us postulate *rhetorical agency*, then, as a form of *networking*, a process in which a rhetorical agent, or node, connects with and possibly exercises an effect/affect upon another such node. This may occur through speech or electronic media, face-to-face, in small groups, or in public. Rhetorical agency is not so much something the agent has, as how the agent does it.

Must the agent be a human subject? Not at all. Richard Dawkins (1976) coined the word "meme" to "convey the idea of a unit of cultural transmission" that propagates itself by "spreading from brain to brain" (192). Texts, like selves, connect to other texts.

One could, following all referents in any given text, and of all texts thereafter, eventually encounter the entire intercultural network of texts.

Were it possible to quantify agency, we could speculate that the most richly connected agents, whether human subjects or texts, would have more agency. Dispossessed or disadvantaged people with no one but their immediate contacts to look out for them, and texts unpublished (or unpublishable), would have less.

If agency is the propagation of utterances, texts, or memes through a process of networking, then any particular agent (some more than others given a particular social or political context) may gain agency by adding connections. The policies of numerous totalitarian regimes forbidding free assembly, or gatherings of any more than three people at a time, attest to those regimes' intuitive grasp of agency in the sense that I am explaining it here. In expressly forbidding the conditions under which a society-wide network might form, they reduce the effective agency of each citizen/subject to his or her immediate acquaintances.

Furthermore, given Sigmund Freud's (1923/1960) contention in *The Ego and the Id* that normal people have not just a far greater extent for immorality than they believe, but also far more capacity for morality than they know, Slavoj Žižek (1991) suggests that "We should, then, renounce the usual notion of the unconscious as a kind of 'reservoir' of wild, illicit drives: the unconscious is also (one is tempted to say: above all) fragments of a traumatic, cruel, capricious 'unintelligible' and 'irrational' law text, a set of prohibitions and injunctions" (152).

Steven Spielberg seems to have realized this. He maintained a magnificent silence about the motive force of his *Schindler's List* protagonist, as if to entice filmgoers to seek

163

not just the hidden holes of *darkness* in the world's Hitlers, but the secret cracks of *light* in its Schindlers. Why, indeed, imagine the rhetorical subject a kernel of despair, when it could well be a node of joy?

WORLD WIDE WEB

Suellen Campbell finds much in common between ecology and post-structuralist theory, including a revolutionary critical stance, a polemical questioning of concepts on which established political and economic hierarchies are built, a shared critique of the idea of objectivity, and the knowledge that actions in a given context reverberate farther than we know. Most importantly, both post-structuralism and ecology substitute the idea of a unitary *center* with that of a *network* (1994).

While post-structuralism might feel utterly liberating, ecology sounds a call to caution, and the difference lies in the realms occupied by both perspectives. The raft of the soul, after all, floats down an easily contaminated bloodstream. "As free as … mind may appear in its wanderings, thoughts rely on calories" (Fromm 1996, 38), taking a sardonic view of cost-benefit and economic tradeoff analyses in which the "necessities of life" cannot be imagined relinquished merely "for the sake of clean air."

Theory thrives in the realm of mind, and ecology charts networks of bodies. Campbell balks at the "extreme" position of, for example, the Yale deconstructionists, but why apologize? Why hold back? In the realm of pure mind, there are no limits. Anything's possible in theory as popularly understood, so why not in critical theory?

Certainly post-structural, postmodern, and critical theorists understand with those sharing an ecological perspective that a perfect understanding of the entire system in which one's own particular standpoint of observation is embedded is impossible. Few

164

ecologists would argue that a final Truth about a complex system like the biosphere can at best be approached and refined but never attained. "There are no natural limits to literary criticism," (Howarth 1994), but the ecologist always knows that s/he will reach an outer limit, and will always run up against Burke's "unanswerable opponent." Rejecting the postmodern claim that "nature" is a mere social construct, Jonathan Bate (1991) writes:

> It is profoundly unhelpful to say "*There is no nature*" at a time when our most urgent need is to address and redress the consequences of human civilization's insatiable desire to consume the products of the earth. . . . When there have been a few more accidents at nuclear power stations, when there are no more rainforests, and when every wilderness has been ravaged for its mineral resources, then let us say "*There is no nature.*" (56)

Texts versus ecosystems, Campbell muses, concluding that theory is useful, but ecology is more important. In short, deconstruction and Truth are obverse sides of the same idealistic fancy: there are no limits, the body can be transcended, and there is no Earth. At least popular writers of narratives taking place in scientifically impossible or astronomically distant worlds are honest enough to call their entertainments *fantasy*, or science *fiction.* Between Gorgias and Plato I choose Isocrates, simultaneously anticipating and superseding the postmodern, who neither sought a final Truth nor abandoned hope that a truth for one's own time and place could be found and shared. In the 21st century, *kairos* is the biosphere, and so there is much that networks, the common conceptual root of environmental communication and ecological rhetoric, can offer the general study of human communication and rhetoric.

CHAPTER 7

CONCLUSION

We have now gleaned several important aspects of ecological rhetoric by subjecting the concept to a plurality of analytical methods including rhetorical criticism, media ecology, semiotics, the survey-based quantitative experiment, and less typically for a dissertation in rhetoric, network science. Our discussion of selected key texts or artifacts bearing upon environmental issues (overpopulation, the Interstate system, global warming, and the Louisiana coast) should indicate the narrative, material, indexical, and networked characteristics of ecological rhetoric, rhetoric potentially about ecology, but by definition rhetoric from an ecological perspective.

This dissertation could not intend (or pretend) to approach ecological rhetoric from all possible methodological perspectives, but it should stand as a text complete in itself and not simply a set of "notes toward." I hope to have established a clear distinction between environmental rhetoric and ecological rhetoric, and to have demonstrated the conceptual common ground underlying ecological rhetoric (frequently though not necessarily concerned with environmental issues or advocacy), and the field of environmental communication. In addition, I intended to provide not just short examples of how methods might be applied, but analyses of rhetorical artifacts that may stand on their own as such, and even at times expand to some extent on the theoretical bases for applying a particular method in the first place. Some closing remarks on the implications of this doctoral thesis are divided in the environmentalist spirit into the short-term (future directions for research) and the long term (the ultimate utility of the networking metaphor underlying the theoretical reflections on this essay's critical analyses).

A book-length treatment of ecological rhetoric could extend this project in at least two ways, one fairly easy to encapsulate in chapters of examples, and the other more open-ended, perhaps best served by monographs or essays by other writers expert in specific disciplines or methodological approaches.

The first extension of this project could enumerate and summarize examples of ecological rhetoric that have or had nothing to do with environmental issues or advocacy. Since not all ecological rhetoric need concern ecology itself, nor "the environment," the biosphere, nature, Nature, "nature," or "Nature," one might explore how non-environmental persuaders and speakers and advocates use, to powerful or feeble effect, ecological rhetoric as outlined here, explaining the influence of contemporary message sources by using ecological rhetoric as a framework for explaining the power or futility of specific rhetorical efforts. One could also inquire into how ecological rhetoric might have appeared and reappeared throughout the history of rhetoric without being identified as such (as it could not have been for the most part, the term *oecology* having not been coined until 1869 by Ernst Haeckel).

For example, it might be suggested in the area of African-American oratory that the speeches of Malcolm X, with their careful delineations of the connections among individual oppression, voting patterns, institutional reform, and potential violence, drew closer to ecological rhetoric than the more religious rhetorical pattern of Martin Luther King. A longer set of examples should make explicit, especially in an era when the suffix "eco-" is appended to cast an angelic sheen upon any given noun or adjective, that "ecological rhetoric" is a generally descriptive rather than prescriptive term, even though

a rhetorical consultant might draw more from a description of ecological rhetoric for one particular *kairos* than from, for example, constitutive rhetoric (Charland 1987), melodramatic rhetoric (Schwarze 2006) – or environmental rhetoric.

Much environmental advocacy certainly cleaves already to what I have described here as "ecological rhetoric," but not all of it, to be sure. More quantitative analyses of the use of various aspects of ecological rhetoric in environmental communication, as well as public address studies of campaigns in which ecological rhetoric was used as a predominant strategy, may help explain to what extent environmental campaigns succeed or fail, and in what circumstances, to the extent they resemble ecological rhetoric as opposed to using rhetorical strategies such as the jeremiad, the fear appeal, the pathetic fallacy (imagine your grandchildren never seeing a whale), the evocation of the sublime, the cost-benefit analysis, and so on.

A second extension of this work could lie in exploring ecological rhetoric from any number of other productive perspectives that exceeded here the limitations of space, time, and the author's professional competence. I offer a short list of possibilities, starting with a pair of explorations in progress, followed by examples of approaches perhaps more fruitfully pursued by others.

Obviously, speakers like Gore and Hardin desire from their audiences more than mere attitude change toward nature. They and countless other environmental advocates want to make the prospect of a dismal future so utterly plausible and the possibility of action in the present to forestall it so readily available that a decision maker's lack of right action toward to the future would haunt him or her as surely as the memory of a bad action in the past. A variant of critical/cultural studies often called ecocriticism has

168

helped me to explore in part, in a separate article in progress, the literary connection between Charles Dickens's most famous fable and the landmark work of Rachel Carson to highlight the essentially *haunted* quality of ecological rhetoric. Being haunted by ghosts from the future might seem a counterintuitive notion at first, so I explain in theory how this situation comes about, indicating some postwar examples of such haunting as depicted in and accomplished by, in brief, popular science fiction and, at more length, in contemporary (post-*Silent Spring*) American environmental rhetoric. I conclude that haunting a reader or auditor with a ghost from the future is a widespread, if little articulated or explicated, rhetorical strategy, and suggest that the ghost from the future stands as a metaphor for the rhetorical intent of writers and filmmakers in popular culture, and of certain public advocates for social and political change. It represents a rhetorical trope common to artists of a type often analyzed in cultural studies, and to writers and speakers normally discussed by public address scholars.

Haunting, however, as spiritual a matter as it may appear or be represented in numerous narratives, is experienced in the body, and the phenomenological experience of the human body in its environment should concern us in a full-length discussion of ecological beyond the extent it did in chapter 3. The work of the Canadian naturalist John A. Livingston stands as a scathing critique of all who would plunder or abandon the nonhuman world, but also of the thought of many who would preserve it or manage its conversation. His essentially visceral understanding of the rhetor's connection to the non-rhetorical world, especially when read in conjunction with the thought of Emmanuel Levinas, should throw a materially based but *ethical* underpinning of ecological rhetoric into sharp relief.

Of course, not all possible methodological approaches to ecological rhetoric have been covered here, in part due to the preferences and competence of the writer, but also according to a certain internal logic. No less than the Dalai Lama once remarked that a world of Buddhists would be rather boring, so one should try to accomplish the essential first through one's own tradition. A future rhetoric professor resident in the U.S. but steeped in the Canadian communications tradition thus began with critical methods developed to the greatest extent where he lives and where he comes from.

As for a set of methodological approaches that taken together could comprise a second dissertation in the manner of this one, three obvious choices appear to me: aesthetics, feminism, and psychology. How it is that some perspectives are simply more viscerally satisfying or beautiful than others? What is the connection between a network of sense impressions, a network of persuasive appeals, and a network of aesthetic criteria? The drive in feminist thought (in any of its non-essentialist variants) not merely to deconstruct, but immediately to reconstruct and then to teach strikes me as particularly useful to a long-term study of ecological rhetoric, especially given the simultaneously productive and problematic perspective of ecofeminism. Finally, any of several approaches to psychology might elucidate the connection between the networked self and its interconnections to the social and biological systems in which it is embedded. Among several entry points might be Paul Shepard's exploration of the link between a separation from nature and neurotic behaviors, Theodore Roseck's proposed field of ecopsychology, Freud's connection of repression and civilization, and Lacan's fusion of psychoanalysis with semiotics (a system that prove more amenable to Peircean semiotics than Saussurean semiology).

Many qualitative research methods, most quantitative methods, other approaches to performative writing, and numerous approaches from critical and postmodern theory lie unexplored. What else is missing? Policy analysis? Compliance-gaining? Mediated communication? Journalism? Surely ecological rhetoric could be examined through any or all of these approaches, but that would be to confuse "dissertation" with "career," and to rise rapidly, according to Peter's Principle, to one's level of incompetence, assuming it has not been attained somewhere in chapter 6.

LONG-TERM

One caveat (obvious to me, therefore, I assume, the reader) may arise from a recollection of cultural and historical perspectives of nature together with a history of technology. The sun was once hauled across the sky by Helios in his chariot, since everything that was not us was filled with entities just like us, except bigger, stronger, and immortal. Not long after the town clock became an index of municipal prosperity and progress, it turned out that everything was mechanical, from the music of the spheres to particles of blood, including ourselves, though unlike animals, we were machines with souls added. Before long, the steam engine and governor not only improved the efficiency and power of our machines, they explained how we, too, in regions of the mind inaccessible even to reflection and mediation, were an assemblage of repressions, safety overrides, and pressure-release valves. It was not long after computers were built and in widespread use that we became able to set aside this mechanical psychology and reprogram ourselves for success and achievement, despite our genes being programmed for survival and self-propagation. Is it any surprise in the Internet generation to read a

treatise suggesting we turn to networks to understand ecology, society, and all of rhetoric?

In defense of the network image, I suggest two factors in its favor. First, even though programming, steam power, gear-driven mechanisms, and wheeled carriages have not existed in most human times and places, networks have always existed, including intra- and inter-group alliances and often local market economies. Second, mechanics, propulsion, and programming do lend themselves to mathematical description, but the extrapolation from networks as mathematically depicted to the activity of human brains and societies is not a mere analogy as might be argued for programming and hydraulics, since the networks in question are networks as such and directly observable as such.

Networks also open an avenue for conversation between (to summarize the matter in a very pedestrian manner) classical and post-structural perspectives on communication theory. Debating whether something called the rhetorical agent is a singularity or decentered does not seem to lead in a productive direction, any more than in the vapid and imaginary "two sides" of the "evolution debate" in popular culture. The question of the decentered subject is settled in the same way that the evolution "debate" is settled, and also *merely* in the way that is it is settled. The virtually unanimous scientific consensus that Darwin described in essence the development of sensate matter, living material, is only the final word for non-scientists. Within the sphere of science, it is simply the beginning of a long and hotly contested discussion about details. Similarly, to assert that network science can serve as a paradigm for discussing and perhaps resolving problems in human communication research and rhetorical studies is simply to propose a fruitful model for extensive elaboration and future clarification.

In the area of textual criticism, analysis of multimedia artifacts, measurement of phenomena in interpersonal communication, social network research, and the links between neurobiology and culture, network science simply points in a specific direction. To say in the manner of the pre-Socratics that "all is networks" is to imagine a biologist thinking his or her entire career accomplished by saying "Darwin was right."

Specific possible directions for rhetorical studies now come clear. What student of public address would not feel enticed by the prospect of understanding how *private* interpersonal address, by way of its potentially rapid propagation through a network of well-connected individuals, has *public* consequences? How can or how will people address those individual human nodes whose social participation as connectors, explainers, or persuaders precipitate epidemics of understanding? What makes some memes spread like the flu and others lie like a half a page of scribbled lines in a wastebasket?

Media scholars might inquire at what point interpersonal communication in a richly connected network becomes mass communication. Or does the essence of a meme's so called stickiness lie in numerous cases not in its content, but in its *performance?* Ample opportunities should resent themselves for extra-disciplinary research involving communication scholars, not to mention intradisciplinary cooperation among Communication Studies' myriad "interest groups."

The fundamental epistemological quandaries posed in the areas of chaos, complexity, and networking resemble those found in the two disparate worldviews of physics and psychoanalysis. Communication Studies might bridge the discursive systems

and discourse communities of the hard sciences, and the more creatively elaborated systems of rhetorical or psychoanalytic theory.

"Somehow, after all, as the universe ebbs toward its final equilibrium in the featureless heat bath of maximum entropy, it manages to create interesting structures" (Gleick 1987, 308). We still have ample time before then to describe some of those structures in a way that those outside the field might find illuminating and useful. Whether we link concepts and metaphors together in performance, replicate the world while constructing listeners' apprehension of it in rhetoric, or delineate the structure of social and political networks in mass media studies, we will, or should, rely upon while perhaps even clarifying core concepts in complexity and networking. Let us see Communication Studies as more than an interdisciplinary field, shedding subdisciplines as the decades pass, and more as an academic node, linking in network fashion to a dispersed ecosystem of other scholarly endeavors and inquiries.

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VITA

Kevin James Ells was born in Halifax, Nova Scotia, near the dawn of the Space Age, and grew up in St. John's, Newfoundland. He earned a Bachelor of Commerce in finance with a minor in music at Dalhousie University, Halifax. After an improvisatory interlude in Europe, Ottawa, Paris, Halifax, Montreal, and Ottawa again, he taught ESL and business courses for the Toronto School Board while working toward a Master of Environmental Studies in media and political ecology at York University (Toronto) which he completed in the summer of 1995, moving immediately thereupon to Missouri to work in the same town as the Louisiana native he married in 1998. At a two-year state technical college, he taught introductory courses in accounting, communication, composition, computers, economics, ESL, and marketing, while earning a certificate in computer networking, before moving with his family to Louisiana. He enrolled as a graduate teaching assistant in the doctoral program in rhetoric in the Department of Communication Studies at Louisiana State University in 2003, completing his comprehensive exams in April 2005, and joining the faculty at Louisiana State University at Alexandria as Assistant Professor of Communication Studies the following year. A participant in the rhetoric section of the 2005 National Communication Association Doctoral Honors Seminar, his work has appeared in *Text and Performance Quarterly* and is forthcoming in *Environmental Communication: A Journal of Nature and Culture.* He fulfilled his final requirements toward the degree of Doctor of Philosophy in the waning hours of 2007.