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SENSE OF PLACE AND

SENSE OF PLANET.

OXFORD UP

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NARRATIVE IN THE  
WORLD RISK SOCIETY

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Academic concepts, at times, take on a life of their own in figures of speech, everyday habits, or market commodities, while their intellectual merit and implications are still being discussed among the experts. Many of the terms associated with postmodern culture, such as "deconstruction" and "hyper-reality," trickled down in this way. But when German sociologist Ulrich Beck coined the term "risk society" in the mid-1980s as an alternative to the notion of "postmodern" social structures, he could not have anticipated that the idea of a society reconfigured by pervasive ecological and technological risk scenarios would one day translate into the commodified cuteness that characterizes certain sectors of the child and youth entertainment industry. Yet precisely this kind of translation underlies a whole series of recent toy figures marketed by UNKL, a division of the design company big-giant. Founded by Derek Welch and Jason Bacon in 2000, UNKL designs toys and apparel for a hip and urban youth culture. One of their series of toy figures (and related T-shirts) is called HazMaPo, most likely an abbreviation of "Hazardous Materials Police," and consists of about a dozen different vinyl figures in various kinds of gas masks and protection suits. Offered in a variety of colors from translucent white, pastel blue, and green to neon red, orange, and black, these figures combine the ominous look of gas masks, breathing tubes, oxygen tanks, helmets, and full-body suits with the quaint charm of robot tin toys and the neotenic cuteness of Japanese toys such as Hello Kitty, Badtz-Maru, the innumerable Pokémon characters or the enduringly popular Tamagotchi (fig. 4.1). Welch and Bacon explain on their website:

In creating the HazMaPo figures, the concept was to take two things representing opposite points of view and combine them together forming something both familiar and fresh. We took a friendly, simplified figure and juxtaposed it with the ominous implications of hazmat suits

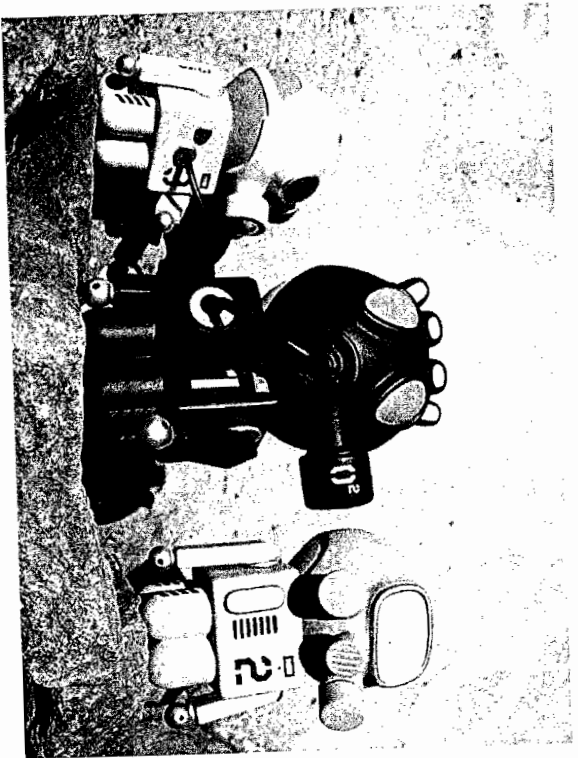


Figure 4.1. UNKLI's line of HazMatPo toy figures. Reproduced by permission of UNKLI.

and gas masks. They're cute, in a sinister sort of way. ([www.unklbrand.com/stories\\_detail.php?ID=7](http://www.unklbrand.com/stories_detail.php?ID=7))

The disconcerting idea of an adorable toy figure with little pink and white hearts on her hazmat suit and oxygen tank, in one HazMatPo version, may at first sight seem to derive from nothing more than the slightly cynical imagination of two artists turned youth culture marketers. Yet an entirely mainstream German toy manufacturer such as Playmobil also now includes a "HAZMAT Crew" among its toy figurine sets, outfitted with green protective suits, helmets, rubber boots, gloves, shop vac, and a barrel of toxic material lovingly detailed down to the yellow warning label with skull and bones on the side (fig. 4.2). As opposed to UNKLI's Playmobil's website betrays no sense of any incongruence in offering such a scenario to children from the age of four. And perhaps it should not, given that toy figures and vehicles even for young children have long included police cars, ambulances, and fire trucks. Yet the fact that toxic cleanup crews have now become as routine a part of children's playworlds as fire trucks foregrounds that the contaminated environment Rachel Carson decried at the inception of the environmental movement in the 1960s is now fully integrated into the ordinariness of everyday life. Some awareness of technological and ecological as well as other risk scenarios, these toys indicate, from carcinogens in food to toxic spills and global warming

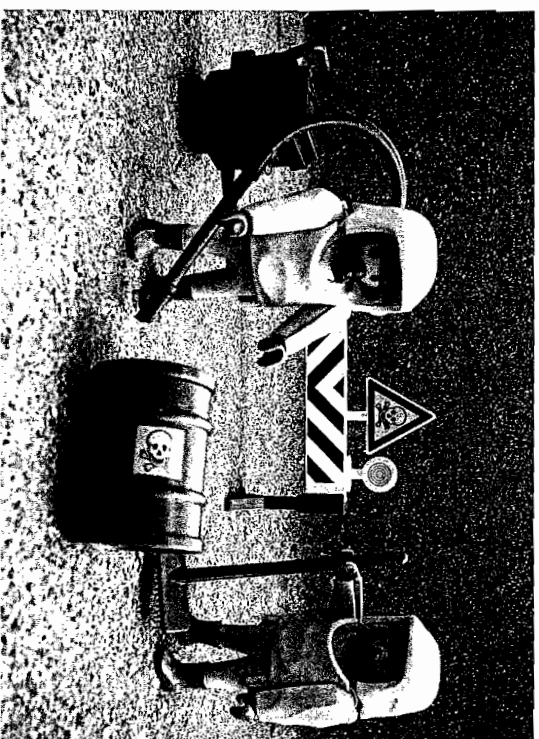


Figure 4.2. Playmobil's toy set "HAZMAT Crew."

has, consciously or unconsciously, become an inescapable component of daily routines.

Increasingly, such risk awareness has also come to reshape the imagination of the global in its environmentalist as well as other dimensions. To some extent, one could argue that translocal risk perceptions reveal the dark side of the cosmopolitanism I outlined in chapter 1, in that an awareness of ecological and cultural connectedness implies a knowledge of the kinds of risk that are generated by such connectivity: the introduction of nonnative organisms into local ecosystems, for example, the impact of global markets on local natural resources or farming practices, pollution of oceans, acid rain, radioactive fallout, or global warming. But to leave it at that would be to ignore the ways risk perceptions, and a particular understanding of the relationship of certain risk scenarios to modern societies, have galvanized the environmentalist movement from its beginnings and continue to do so, in various forms, to this day. Risk has also become an important theoretical lens with which to envision the emergence of new social movements and structures, foregrounding cosmopolitan forms of awareness and inhabitation on the basis of shared risk. This is the gist of much of the environmental justice movement's work (which admittedly tends not to frame its objectives in terms of risk, for reasons I will discuss shortly) as well as of Ulrich Beck's "Cosmopolitan Manifesto," which predicts the rise of new kinds of transnational communities and politics from the "world risk society." Considerations of risk and of local and global forms of belonging, therefore, are imbricated in each other in complex ways that

cannot be summed up in any simple dichotomy of utopian versus dystopian visions.

But while the concept of a contemporary "risk society" has gained currency in the academic circles of Europe, North America, and beyond, Beck's work has often been received in a rather superficial way in literary and cultural studies, where it tends to be invoked without much attention to its details or internal tensions. The relation of Beck's theory to other analyses of risk perceptions and of the connections between risk and modernization are hardly ever mentioned, and indeed the entire field of risk theory, an important interdisciplinary area in the social sciences, is for the most part unknown to literary and cultural scholars. Including, most importantly for my purposes, to many ecocritics. In the first section of this chapter, I will therefore briefly survey studies of risk perceptions, as one of the most important areas of risk analysis over the last four decades, and the major theoretical frameworks on which they are based. Even though such studies gained importance in part because of the public's increased awareness of ecological and technological risk scenarios since the 1960s, they have been received warily by environmentalists, who since the 1980s have objected to both the general usage of the term "risk" and specific dimensions of risk theory. Such objections, I will argue, were based in part on misunderstandings of the theory and in part on resistance to early antienvironmentalist biases in risk perception studies that have since been questioned and reversed in the field itself. Investigations of risk perceptions, therefore, have become an extremely important resource for the cultural study of contemporary societies' relation to the natural environment. Section 2 elaborates on such concerns that are shared between risk theory and literary study by highlighting the ways perceptions of ecological and technological risk scenarios are shaped by and filtered through narrative templates that manifest themselves in both visual and verbal artifacts. Apocalyptic narrative, with its portrayal of an entire planet on the brink of ecological collapse and human populations threatened in their very survival, has been one of the most influential forms of risk communication in the modern environmental movement, especially since it has often implicitly or explicitly relied on pastoral as the template for alternative scenarios. Both apocalypse and pastoral have been controversially debated among ecocritics: while many consider both genres at best ambivalent tools in the current state of environmental discourse, they nevertheless feel uncomfortable with what they perceive to be the impact of risk discourse on these rhetorical templates, especially since risk analyses, which can easily accommodate apocalyptic and "toxic discourses," are more difficult to compatibilize with lingering pastoral impulses. As I showed in chapter 1, such pastoral residues manifest themselves variously in longings for a return to premodern ways of life, "detoxified" bodies, and holistic, small-scale communities. To

explore more generally what kinds of narrative risk analysis has relied on and how they relate to environmentalist story templates, section 3 turns to theoretical approaches that address the relationship of contemporary hazards to processes of modernization and technological innovation, including Beck's hypothesis of an emergent "risk society." Such theories partly diverge from and partly dovetail with the environmental justice movement in their conception of the connection between risk scenarios and the transformation of basic social structures, including modes of spatial belonging and deterritorialization. This particular concern is elaborated further in section 4, which explores the impact of technological and ecological risk scenarios on ways of inhabiting local, national, and global spaces and systems. As risk scenarios, especially those that transcend the local, form part of the complex processes of deterritorialization that I analyzed in chapter 1, they both disrupt existing ties to place and create alternative networks of cultural practices at various scales and across national and regional borders, in a process that transforms some of the trivialities of everyday life as much as some of the large-scale workings of international politics. Beck's "Cosmopolitan Manifesto" articulates the possibility of new, transnational communities arising from shared risk experiences. But Beck's somewhat simplistic understanding of the relationship between shared risk and shared cultural assumptions needs to be tempered by the more complex accounts of power differentials and cultural conflict even in the face of shared political struggles in the writings of environmental justice advocates and political scientists. Both the risk society and the environmental justice models, I will suggest, stand to benefit from the more nuanced analyses of crosscultural literacy in cultural scholars' approaches to cosmopolitanism that I discussed in chapter 1. Understanding global risks as shared environmental realities that are nevertheless shaped by and filtered through a range of different cultural frameworks, including local forms of inhabitation, forms part of the environmentally oriented cosmopolitanism I outlined in that chapter.

Chapters 5 and 6 will tie these theoretical considerations back into the analysis of literary texts: chapter 5 focuses on two American novels that prominently feature incidents of local chemical exposure, Don DeLillo's *White Noise* and Richard Powers's *Gain*, while chapter 6 examines two German novels, Christa Wolf's *Störfall: Nachrichten eines Tages* (Accident: A day's news) and Gabriele Wohmann's *Der Flötenton* (The sound of the flute), which revolve around the international risk scenario that unfolded after the nuclear reactor explosion at Chernobyl, Ukraine, in 1986. All of these texts reflect on the way individuals and communities renegotiate the relationship between local, national and international networks of culture and economics in light of their exposure to risk, at the same time that they explore what narrative shape such a reconfigured relationship might take.

## 1. Theories of Risk Perception: Science, Culture, Narrative

Seen from an anthropological perspective, human cultures have engaged with risk scenarios of widely varying kinds throughout their history. But more formal studies of risk have only emerged more recently. The study of medical and economic risks reaches back at least to the eighteenth century, while investigations of technological hazards and natural disasters began in the early twentieth century (Golding 25). Analyses of technological and ecological risk scenarios emerged as a separate area of study in the social sciences in the late 1960s and early 1970s. In 1969, a seminal article by the engineer Chauncey Starr that set out to measure social benefits and technological risks in relation to each other opened up the problem of risk assessment to systematic research, at a time when the public had become increasingly aware of and concerned about chemical, nuclear, and other environmental dangers.<sup>1</sup> In the following decades, risk theory developed in an interdisciplinary matrix involving mainly cognitive psychology, sociology, and anthropology; especially from the 1990s onward, political scientists and economists have also become increasingly interested in the field.<sup>2</sup> Over time, a range of different theories have evolved in the field that focus on somewhat different objects of study and base themselves on divergent methodological assumptions. The most empirically oriented part of the field, which is also the one that has to date generated the greatest bulk of research, focuses on the ways risks are perceived and evaluated by different population segments, and attempts to identify the sociological, psychological, or other factors that might explain these risk assessments. Some of the basic theoretical paradigms that have been proposed in this part of the field will be discussed in this section, while section 3 will focus on theories that address the underlying causes of technological risk, their relation to modernization processes, and their impact on social structures.

In the late 1970s, risk analysis was dominated by the so-called psychometric paradigm. Empirical studies, often carried out by cognitive psychologists, sought to determine how the public perceives a wide range of different types of risks and what reasoning leads to these assessments. Psychometric studies usually assume that the reasons for particular risk assessments combine certain characteristics of the risks themselves with individuals' cognitive behavior, and therefore explore such assessments in terms of theories of heuristics and cognitive biases, that is, decision-making rules and selective information processing. Different groups of individuals, it emerged, use different cognitive models in assessing risks. One of the most salient differences that psychometric research highlighted was the one between expert and lay perceptions. Experts such as scientists, doctors, statisticians, or engineers often tend to evaluate and prioritize risks quite differently from the way the general public does. Statistical

considerations, usually the probability of a particular adverse event multiplied by the magnitude of its consequences, tend to shape expert opinions, while the public's view quite often defies such numerical calculation. The risks associated with nuclear power plants provide an obvious example: based on the very limited number of actual accidents and deaths nuclear plants have so far caused, experts tend to rate their risks as relatively low, while nonexperts, regardless of the low statistics, assess them as much more hazardous than, say, coal mines or highways, which cause a much larger number of fatalities annually.

Psychometrically oriented research has discovered a number of variables that shape such divergences, not only between experts and the general public but also between different segments of the public itself. Regardless of the magnitude of the risk involved, voluntarily selected risks tend to be assessed as less hazardous than those that are involuntarily imposed, for example, leading some people to worry about secondhand smoke even as they underestimate the health effects of bad nutrition. The protagonist of Art Spiegelman's graphic novel *In the Shadow of No Towers*, a chain-smoker, humorously foregrounds this discrepancy when he fulminates against what he believes to be the authorities' cover-up of dangerous air pollution in lower Manhattan in the aftermath of the attack on the World Trade Center: "I'm not even sure I'll live long enough for cigarettes to kill me," he sums up his dual risk perception with characteristic self-irony (3). Similarly, dangers that are imperceptible to the average person tend to appear greater than those that are directly observable: new risks appear greater than old ones and unfamiliar ones more hazardous than well-known ones; risks that entail delayed effects tend to be perceived as greater than those whose effects manifest themselves immediately; risks with controllable or nonfatal consequences are perceived as smaller than those that entail uncontrollable or fatal ones. The geographical scope of a potential hazard also affects perceptions of its magnitude, with local ones appearing less risky than regional or global ones, as do the benefits that are thought to accrue from incurring a particular risk scenario. At times, these kinds of variables in risk perception do not operate in isolation but correlate with each other in individuals' perceptions through an underlying evaluative perspective that statisticians uncover by means of the technique called "principal component analysis."<sup>3</sup> One of these factors is "dread," an almost intuitive fear of some risks that may be less dangerous than other, nondreaded ones: nuclear technology and radioactivity as well as cancer, for example, tend to evoke such dread, while flu epidemics, heart disease, or diabetes do not. Some of these distinctions may strike an outside observer as more rational than others: it seems reasonable, for example, to rate a risk with potentially fatal consequences higher than one with non-fatal ones, whereas assessing risks differently in terms of their perceptibility or imperceptibility, or their immediate or delayed consequences, may seem understandable but illogical. However one rates the validity of such

variables that shape risk perceptions, the fact is that they point to complex evaluative models that go far beyond any simple algorithmic calculation of probability and magnitude (Fischhoff et al., *Acceptable Risk*, chaps. 4-7; Fischhoff, Slovic, and Lichtenstein, "Lay Fobles and Expert Fables"; Slovic, "Perception of Risk").<sup>3</sup>

Differences of gender and race turned out to be other dimensions affecting risk assessments, with women often rating risks as greater and more threatening than men (Spigner, Hawkins, and Loren; Sieger and Witte; Stern, Dietz, and Kalof). In a large study carried out by James Flynn et al. in 1994, nonwhite respondents tended to express greater concern about a variety of risks than white ones, and risk assessments were greater among those with lower incomes and education levels. When the results of this survey were analyzed according to four groups, white females, nonwhite females, white males, and nonwhite males, however, it turned out that it was white males who rated risks far lower than the other groups: closer analysis revealed that it was only about 30 percent of the white males that skewed the results through much lower risk assessments, while the rest corresponded roughly to the other groups. Paul Slovic summarizes the questions and directions these results point toward:

Why do a substantial percentage of white males see the world as so much less risky than everyone else sees it? ... Perhaps white males see less risk in the world because they create, manage, control and benefit from many of the major technologies and activities. Perhaps women and non-white men see the world as more dangerous because in many ways they are more vulnerable, because they benefit less from many of its technologies and institutions, and because they have less power and control over what happens in their communities and their lives. Although the survey conducted by Flynn et al was not designed to test these alternative explanations, the race and gender differences in perceptions and attitudes point toward the role of power, status, alienation, trust, perceived government responsiveness and other sociopolitical factors in determining perception and acceptance of risk. ("Trust," 402)

As these comments already indicate, and as psychometric research has more broadly documented, some risk perceptions have less to do with the public's view of the risk in and of itself than with trust in the institutions in charge of managing it. Sociologist Allan Mazur's detailed study of the Love Canal crisis has shown, for example, that the neighborhood residents' perception of their own endangerment by the toxic waste deposit under the local school was exacerbated by their growing sense that they were being left in the lurch by the New York state health commissioner, which led them shrewdly to enlist the help of the media instead (67-113, 162-93). Trust, in turn, in some cases depends on whether the public perceives the authorities as sharing its salient values (Cvetkovich and Winter 288-89).<sup>4</sup> As Brian Wynne has argued, it is also inflected by the risk bearers' sense

of their sometimes inevitable dependency on the social institutions that manage risk, which by their way of defining and managing it force risk bearers to identify themselves in relation to the knowledge embodied by these institutions ("Sheep" 54-60). Risk perceptions, therefore, cannot be analyzed in isolation from the social and institutional structures that situate individuals, and through which dangers are communicated and administered.

In the late 1970s, psychometrically oriented research assumed on the one hand that lay risk perceptions respond to certain qualitative properties of the risks themselves, and on the other hand that expert assessments, with what was believed to be their clearer grasp of the scenarios, established the accurate and objective scale of a particular risk. Lay perceptions that diverged from this view, it was thought, needed to be explained in social scientific terms and ultimately corrected. In the course of the 1980s, however, these and other assumptions behind the psychometric paradigm came increasingly into question with the rise of "cultural theory" (not to be confused with the meaning of this phrase in the context of cultural studies). Pioneered by anthropologist Mary Douglas and sociologist Aaron Wildavsky's highly controversial book *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers* (1982), cultural theory in its initial phase built on Douglas's earlier work on taboo in premodern societies. Douglas and Wildavsky started from the observation that any community, whether modern or premodern, is affected by a wide range of risks, but only some of these are selected for conscious awareness and given particular social and cultural significance. The cognitive models of individuals are far less important in explaining this awareness and significance, according to Douglas and Wildavsky, than the question what a particular risk perception accomplishes for the values and ultimately the perpetuation of the social structure that shapes it. From this theoretical perspective, individuals do not make risk assessments on a case-by-case basis; rather, their risk assessments can be predicted in broad outline in terms of their association with certain types of social structures (Douglas and Wildavsky: Wildavsky and Dake).

At first glance, this mode of theorizing may appear more familiar and persuasive to scholars in literary and cultural studies than the highly empirical and statistical procedures of the psychometric paradigm. After all, the attempt to explain individual risk perceptions in terms of their function for the self-perpetuation of certain social structures—in other words, in terms of what in literary studies would probably be called their "political implications"—seems to rely on a theoretical gesture that is quite common in studies of culture over the last three decades, in that it exposes risk perceptions as, more or less, forms of ideology. Yet Douglas and Wildavsky are not strict social constructivists where risk is concerned, nor does their concluding analysis in *Risk and Culture* resemble anything one would be tempted to call "politically correct." Douglas, in this book as well

as in her later publications on risk, portrays risks as undoubtedly real, but sees their selection and meaning as culturally conditioned (see Lupton 39). This selection is shaped by social structures that are defined through a "group" variable (that is, the degree to which individuals are bound into a social entity) and a "grid" variable (that is, the way these social bonds are structured by means of particular categories such as hierarchy, gender, kinship, and so on). While this basic grid-group framework can be used to analyze a wide variety of social forms of organization, its particular relevance for Douglas and Wildavsky's argument lies in the way it can predict the shape risk perceptions are likely to take, specifying, for example, what kinds of individuals are most likely to see the greatest risk in economic crises, in international relations and conflicts, or in technological scenarios, respectively.

For someone trained in literary and cultural studies, which have in recent decades stressed the way cultural dispositions and worldviews are shaped by social categories such as race, ethnicity, class, gender, nationality, and religious affiliation, the idea that "the perceiver [of risk] is not an individual, but an institution or organization that is driven by organizational imperatives to select risks for management attention or to suppress them from view" (Rayner 86) has a great deal of intuitive plausibility. In very crude form, a similar basic assumption seems to underlie a novel such as Michael Crichton's notorious *State of Fear*, which aims to expose global warming as a scam with a shrewd mix of action-thriller plotting and references to scientific literature. In the chapter that gives the novel its title, Crichton's spokesperson, a professor specializing in the "ecology of thought," proposes to the protagonist Peter Evans that risk scenarios, including fear of climate change, are systematically generated and maintained by what he calls the "PLM," the "politico-legal-media complex":

"Western nations are fabulously safe. Yet people do not feel they are, because of the PLM. And the PLM is powerful and stable, precisely because it unites so many institutions of society. Politicians need fears to control the population. Lawyers need dangers to litigate, and make money. The media need scare stories to capture an audience. Together, these three estates are so compelling that they can go about their business even if the scare is totally groundless." (456)

Environmental risk perceptions, in this perspective, are just one in a series of socially generated fears designed to keep the population in check, and lawyers and journalists in business:

"For fifty years, Western nations had maintained their citizens in a state of perpetual fear. Fear of the other side. Fear of nuclear war. The Communist menace. The Iron Curtain. The Evil Empire. And within the Communist countries, the same in reverse. Fear of us. Then, suddenly,

in the fall of 1989, it was all finished . . . . The fall of the Berlin Wall created a vacuum of fear . . . . Something had to fill it.

Evans frowned. "You're saying that environmental crises took the place of the Cold War?"

"That is what the evidence shows . . . . The point is, although the specific cause of our fear may change, we are never without the fear itself. Fear pervades society in all its aspects. Perpetually." (454–55)

Least one be tempted to dismiss this claim as nothing but right-wing propaganda—though that is undoubtedly the way it is used in this novel—it may be well to remember that left-wing writer and filmmaker Michael Moore makes a very similar argument toward the end of his documentary *Fahrenheit 9/11*, when he suggests that fear of terrorism is largely the fabrication of a right-wing government in conjunction with certain class and religious interests, intended to keep the more disenfranchised segments of the U.S. population in check. Whatever political coloration this idea takes, in other words, the assumption in both cases is that some of the risk scenarios that have dominated public debate in the United States over the last few decades are shaped by well-defined institutional interests and social organizations.

One might expect that Douglas and Wildavsky's "cultural" approach to risk would translate into a more sophisticated and detailed investigation than Crichton's or Moore's of how particular social institutions generate or contribute to risk perceptions, as well as how they intermesh with more individual preferences and biases. While some such research has been undertaken—some of it more strongly influenced by Foucault than by Douglas and Wildavsky, however, as I will explain shortly—most cultural theorists have developed the paradigm in a quite different manner. They have analyzed how certain types of grid-group formations tend to generate worldviews that can be characterized broadly as, for example, "fatalism," "hierarchy," "individualism," "egalitarianism," or "technological enthusiasm," which in turn tend to be accompanied by specific patterns of risk perception. This type of research had to grapple with methodological difficulties such as the question of how to operationalize the grid-group schema into empirically testable research hypotheses, how to theorize the coexistence and interaction of these different structures at various scales of social organization, and how to account for individuals' varying engagements with different kinds of social structures (Rayner 96–98, 104–6; Lupton 51–57).<sup>5</sup> Nevertheless, it clearly emerged that such basic worldviews or dispositions do play a role in shaping the risk perceptions of individuals. But while Douglas and Wildavsky, in their own study, had much to say about the way environmental organizations reflect the risk perceptions of certain parts of the U.S. population, detailed analyses of the functioning of other institutions—schools, universities, political parties, professional organizations, churches, clubs and asso-

citations, or particular media—have remained far fewer in number than more general surveys of the public.

The use of such survey data in cultural-theoretical research facilitated integration of some of its findings into psychometric research, which has not adopted cultural-theoretical assumptions wholesale, but has nevertheless worked to incorporate a wide variety of cultural factors into its analyses. Psychometric analyses have taken over from cultural theorists the insight that worldviews, understood broadly as “general social, cultural and political attitudes” inlect perceptions of risk, and that they seem to do so more for some risk scenarios than others (Slovic, “Trust” 402). One study, for example, showed that attitudes toward nuclear power were particularly strongly correlated to such general worldviews (Peters and Slovic). The same study, as well as a series of others, also demonstrated the important role of positive and negative affect in people’s judgments of risk: according to these studies, mental representations of particular phenomena or events are associated with varying degrees of affect, and individuals refer consciously or unconsciously to such emotional tags when they make judgments or decisions, using what some researchers call an “affect heuristic” (Finucane et al., Peters and Slovic). Recent psychometric research, then, by integrating variables such as worldviews, cultural biases, and affect into its basic models, has moved far beyond its original framework of the 1970s.

Another dimension of risk research that at times tends to blur the distinction between psychometric and cultural approaches involves the social mechanisms and institutions whereby risk perceptions are generated, altered, and disseminated. The mass media, schools, universities, and churches play an obvious role in this process, but also less formal networks of family, friends, private organizations, internet chat groups, and so forth. In the mid-1980s, Roger Kasperson et al. proposed the concept of the “social amplification of risk” to describe the mediating processes and institutions that shape the social experience of risk, which they later expanded to encompass both “social amplification” and “social attenuation” of risk (Flynn et al., *Risk, Media and Stigma*; Kasperson, “The Social Amplification of Risk: Progress”; Kasperson et al., “Introduction” 35–39; Kasperson et al., “The Social Amplification of Risk”). This concept has remained extremely important to the field today, and to the extent that most individuals only find out about the risks that immediately concern them through one or another social network or institution, it points to an important dimension of knowledge about risk.<sup>6</sup> But obviously, studies of how risk perceptions are socially transmitted must also take into account the institutional interests that shape these mediation processes, and thereby the broader questions about the role played by social entities and organizations that cultural theory tends to focus on. While some basic differences between the psychometric and cultural approaches persist, then, the distinctions between

them are no longer as clear-cut as they were in the early stages of cultural theory in the 1980s.

Consideration of risk perceptions as they are generated and shaped by institutions also links the psychometric and cultural paradigms to a third approach that crucially relies on Michel Foucault’s concept of “governmentality.” Following the lines of argument established by Foucault’s research on sexuality, madness, criminality, and discipline, theorists especially in Britain and Australia investigate how governments, insurance companies, and other social institutions establish categories of people at risk that ultimately serve purposes of social surveillance and control (see Castel; Ewald, “Insurance and Risk” and “Two Infinities”; O’Malley). Risk insurance practices that arose in the nineteenth century provide a rich field of historical investigation in this respect, but Foucaultian researchers also take an interest in how less formal but nevertheless pervasive categories operate. Deborah Lupton, for example, has studied how contemporary societies envision pregnant women and young children as categories of people particularly at risk, and what formal and informal regimes of advice and constraint follow from this perception (88–90).<sup>7</sup>

Some recent work on risk perception has questioned the validity especially of the psychometric and the cultural-theory paradigms. Swedish psychologist Lennart Sjöberg has pointed out that the kinds of factors these paradigms tend to investigate in surveys often only explain a small part of the variance in the responses (“Risk Perception Models”). In his own research on the European public’s attitudes toward genetically modified foods, he found that perceived “interference with nature” as well as New Age beliefs and moral persuasions exerted a greater influence on risk assessments than novelty or dread, factors typically associated with the psychometric approach, or the worldviews dominant in cultural theory. In view of such variables that are not adequately accounted for in the existing models, Sjöberg calls for the development of new paradigms to explain existing risk perceptions (“Principles” S49–S51).

Research on risk perceptions, therefore, is constantly evolving, even as the theoretical frameworks by means of which it should be organized continue to be debated. As even my brief survey here shows, these discussions take place at an intersection of science, society, and culture that defines “risk” as a concept that encompasses far more than its technical or actuarial definitions to include complex cognitive, affective, social, and cultural processes without which it cannot be conceived, defined, or investigated. In the debates over how risk should be theoretically understood, empirically studied, and politically managed, questions over the “objective” or “socially constructed” nature of risks have persistently surfaced, as have questions about their social mediation (“amplification” and “attenuation”). Like other research areas at the intersection of science and culture, risk analysis is marked by conflicts between realist and various

kinds of constructivist approaches that cut across the different theoretical paradigms. As I have shown, risk analysis moved from the predominantly realist assumptions of the psychometric paradigm in the 1970s to increasingly nuanced analyses of the social and cultural frameworks that shape nonexpert risk assessments, in a process that ended up undermining neat distinctions between expert and lay perceptions. As risk theorists attempted to model the different kinds of rationalities that go into such assessments, the question was no longer only which risk perceptions might be the most rational or realistic but also what criteria should be used to gauge degrees of rationality or realism.

Raising this question has led some theorists to a more radical perspective that emphasizes the difficulty of positing any unequivocal boundary between objective and subjective judgments about risk. In this view, the assessments of experts are not exempt from bias, specific interests, and underlying value structures, and the concept of "objective risk" really makes no sense. Any debate about risk includes participants who have widely varying values and priorities, and their definitions of risk as well as their assessments of what constitutes acceptability or the magnitude of a particular risk will depend on these values; being an expert or non-expert is only one variable in this priority structure. Any decision about risks is therefore at bottom political. This argument comes in several different versions, with some theorists willing to accept some distinction between different degrees of objectivity (if not between absolute objectivity and subjectivity), while others dismiss the notion of objectivity completely and associate their rejection with a more general constructivist critique of science as a privileged mode of knowledge (Otway; Wynne, "Institutional Mythologies").

Needless to say, these controversies are far from mere academic quibbles. Risk assessment is a large applied field in industry and government today, and sometimes comes loaded with political charges. Controversies in these areas are often deeply embedded in conflicts over cultural values and the question of who has the right to make decisions over how technologies are implemented—conflicts that lie at the heart of many environmental struggles around the globe. These struggles have carried over into the academic investigation of risk perceptions, especially since such conflicts are often experienced as confrontations between local knowledge and abstract scientific or administrative expertise, between traditional and modern or global ways of life, and between the different ways risk scenarios are understood and managed in these frameworks. The question of environmentalist perspectives, therefore, has been a crucial dimension of debates over risk in political terms since the 1960s, and in theoretical terms since the 1980s.

Struggles around environmentalist perceptions of present and future dangers began to reshape the political scene in the 1960s and continued throughout the 1970s and 1980s, including Rachel Carson's warnings re-

garding pesticide overuse, Paul Ehrlich's cautions about rapid demographic growth, the Meadows's projections of resource shortages, confrontations over nuclear technology, and incidents involving industrial accidents and spillages around the world: for example, the mercury poisoning discovered in Minamata, Japan, in 1956 that caused investigation and litigation until the early 1970s and gave rise to the eloquent writings of Michiko Ishimure; the dioxin release at the disaster in Seveso, Italy, in 1976; the Love Canal crisis of 1978–80; the Three Mile Island incident in 1979; the chemical explosion in Bhopal, India, in 1984; the dioxin scare that led to the evacuation of Times Beach, Missouri, in 1985; and the nuclear explosion in Chernobyl in 1986, to name only a few of the most prominent crises. In this context, as risk analysis gradually transmuted from a fairly specialized area of research and professional practice into a prominent object of public awareness and debate, some environmentalists resisted adopting usage of the term "risk" instead of alternative concepts such as "danger," "hazard," or "threat." As political science professor Langdon Winner, for example, argued at the time, even using the term "risk" implied ceding territory to the enemy:

Employing this word to talk about any situation declares our willingness to compare expected gain with possible harm. We generally do not define a practice as a risk unless there is an anticipated advantage somehow associated with that practice. In contrast, this disposition to weigh and compare is not invoked by concepts that might be employed as alternatives to "risk"—"danger," "peril," "hazard," and "threat." Such terms do not presuppose that the source of possible injury is also a source of benefits. From the outset, then, those who might wish to propose limits upon any particular industrial or technological application are placed at a disadvantage by selecting "risk" as the focus of their concerns. (149)

From this perspective, Winner argues categorically that "the risk debate is one that certain kinds of social interests can expect to lose by the very act of entering" (148). He is certainly right in highlighting the way a change of terminology such as the one from "hazard" to "risk" can alter the terms of social debate and problem solving. Yet Winner overstates the difference between these particular terms. As Douglas and Lupton have both pointed out, the term "risk" today is associated with overwhelmingly negative connotations for most people in most contexts (Douglas, *Risk and Blame* 24; Lupton 8). At the same time, Winner understates the practical complications that attach to the terms he proposes as alternatives. "Fortunately, many issues talked about as risks can be legitimately described in other ways. . . . A toxic waste disposal site placed in your neighborhood need not be defined as a risk; it might appropriately be defined as a problem of toxic waste." Winner argues (151). True enough—but choosing this seemingly more straightforward terminology does not exempt environmental activ-

ists, decision-makers, or the public from complex and often comparative calculations of which dangers are the most urgent to prevent or remediate, how public funds should be allocated to prevent or clean up a variety of different hazards, or how the interests of different institutions and population groups should be negotiated in the process. In other words, finding a solution to "a problem of toxic waste" will inevitably involve many of the considerations—from statistical calculation to institutional interests, cultural predispositions, affective heuristics, worldviews, and so on—that risk theory has investigated.

A somewhat different but related objection came from environmentalists who understood risk analysis essentially as the setting of "acceptable" levels of certain risks, a procedure that in their view obscured the cost in human health and lives as well as in environmental quality that such acceptability might entail. Physician Joseph Regna, for example, insisting on the "unacceptability of acceptable risk," argued that "the 'no' option—no victims, having zero discharges—never enters the hermetically sealed world of risk assessment" (14). Many other environmentalists have similarly advocated what has come to be called the "precautionary principle," according to which actions whose consequences in the future cannot be determined with scientific certainty should be eschewed in the interest of preventing the emergence of new risk scenarios. "Here is one possible benchmark: if a chemical is not safe for a six-week-old [human] embryo, it is not safe and should not be allowed into the environment." Sandra Steingraber argues in her study of environmental carcinogens (278). This argument makes sense especially in the case of environmental toxins, where specific substances can often be replaced by alternative, less toxic ones, and where industry has often used risk assessment to obscure the dangers that derive from the use of a particular chemical. In other cases, however, the precautionary principle is clearly more difficult to apply. The disposal of existing nuclear waste, for example, affords no "no-option," and advocacy for the discontinuation of nuclear energy has to weigh competing risks associated with the increased burning of fossil fuels. While Regna, Steingraber, and many other critics of the chemical industry in particular may therefore be right in insisting on the application of the precautionary principle wherever possible, this principle cannot generally be extended to all ecological and technological risk scenarios.

"Risk assessment" in the narrow sense in which Regna uses the term—that is, the statistical setting of acceptability levels for chemical substances—is at any rate not identical with risk analysis and theory. Steingraber, who explicitly rejects "risk assessment" (284), nevertheless deploys the vocabulary of "risk factors" and "risk perceptions" throughout her study, in the broader sense of clinical analyses of factors that contribute to disease, and cultural investigations of certain discourses about risk. Academic work in risk analysis, at any rate, is not so much concerned with establishing acceptable levels of safety and risk in various contexts as with

examining precisely why and how limits of safety and risk are established in particular social, cultural, historical, and political contexts—including both the rhetoric of "acceptable risk" and that of "zero risk."

Winner, Regna, and other environmentalists, therefore, took a somewhat reductive view of risk analysis, even considering that they published their critiques in the 1980s, when the field was still in its early stages of development. Nonetheless, they sensed correctly that some of these earlier forms of risk analysis suffered from an in-built antienvironmentalist bias. The psychometric approach, one could argue, manifested such a bias indirectly in its initial tendency to privilege expert rationality over other kinds of cultural logic, without acknowledging that expert opinions might be based on cultural assumptions of their own. Since environmentalist risk assessments often relied on dimensions that were hard to quantify—the sanctity of nature, long-term futures, uncertain consequences—and experts often tended to rate quantifiable risks lower than environmentalists, an imbalance ensued that was only corrected when the psychometric approach increasingly integrated social and cultural factors into its analyses in the 1980s and 1990s. But antienvironmentalist bias is much more obvious in Douglas and Wildavsky's early formulation of cultural theory in *Risk and Culture*. While they started out by using the relatively complex grid-group model of social analysis to characterize different social formations and the worldviews that typically accompany them, they applied their own framework to the United States by postulating a simple dichotomy between social hierarchy and the market at the "center" of American society and egalitarian movements at the "border," which according to their argument generated most technological and ecological risk perceptions. To make things worse, they denigrated environmentalist risk perceptions as "sectarian" while failing to apply any critical analysis to the risk perceptions of corporations or governmental institutions.

Environmentalists were no doubt justified in rejecting an approach that so simplistically and summarily dismissed their perspective. Yet in taking Douglas and Wildavsky's early formulation to be representative of risk analysis as a whole, they overlooked not only alternative theoretical approaches but also the ways Douglas and Wildavsky's theory itself contradicts the logic of some of their antienvironmentalist conclusions, and the ways this theory might in fact be useful for an environmental perspective. Social scientists such as Dorothy Nelkin were quick to point out that Douglas and Wildavsky's analysis of the "egalitarian" bent of the environmentalist movement ignored the broad spectrum of organizations environmentalism had come to encompass by the 1980s, many of which functioned exactly like other highly hierarchical political or corporate organizations (Nelkin). Subsequent cultural theorists have argued that Douglas and Wildavsky's misguided judgment of environmentalism does not logically invalidate their basic suggestion that in order to understand risk perceptions, we need to examine sociocultural institutions, their

value systems, and their modes of operation rather than just individuals' views. This basic assumption logically leads to a critical examination of corporate, governmental, and generally antienvironmentalist risk assessments just as much as of environmentalist ones, as the theory insists on "the inherently cultural nature of any group or community's perceptions and judgments about risk" (Lupton 57). For this reason, Douglas and Wildavsky's antienvironmentalist bias is often seen as clashing with the implications of the theory itself by later cultural theorists, whose work tends to be far more balanced. The core of cultural theory, in other words, is not logically related to and indeed contradicts the antienvironmentalist uses to which Douglas and Wildavsky initially put it.

Almost a quarter century later, the suspicion that risk theory might be inherently antienvironmentalist may itself seem dated, given both the maturation and diversity in the field and the widespread use of risk concepts in public debates. Yet my point is not merely that debates about risks are here to stay but that an acquaintance with the theoretical assumptions and empirical findings in the field are useful and indeed indispensable for environmentalist thinking generally and ecocritical analysis in particular. If environmentalism as a form of social activism aspires to change people's perceptions of the natural world and the threats that emanate from certain activities both for human health and the sustained functioning of ecosystems, it is crucial to understand why and how individuals and communities arrive at such risk judgments. If these assessments are often based on a multiplicity of factors outside of factual information, as risk analysis has shown, environmentalists need to take these factors into account in their own thinking rather than assume that better information will in and of itself lead to a more environmentally oriented perspective. Ecocritics, who have made it their principal task to investigate the cultural practices and artifacts that evolve out of particular conceptions of the relationship between nature and human societies, have a vested interest in the findings of risk theory as an essential part of such conceptions. Not only is risk theorists' exploration of the ways cultural worldviews and institutions shape risk perceptions fundamental background knowledge for anyone interested in the forms that environmental art and writing have taken at different historical moments and in various cultural communities, but inversely, literary critics' detailed analyses of cultural practices stand to enrich and expand the body of data that an interdisciplinary risk theory can build on.

## 2. Risk and Narrative

If the field of technological and ecological risk analysis put its major emphasis on scientific and statistical assessments in the 1970s, it has increasingly come to investigate cultural contexts, dispositions, institutions, and

processes in its attempts to account for both the complexities of risk perceptions and the relationship between risk and modernization. This approach to risk as constituted from within specific sociocultural fields links risk analysis to social studies of science on the one hand and to the concerns of cultural and literary studies on the other. But while the work of Sheila Jasanoff, Brian Wynne, and other scholars has successfully established bridges between social studies of science and risk theory, the interface between risk analysis and literary and cultural studies has so far been less frequently addressed. Risk theorists have paid relatively little attention to the role that particular metaphors, narrative patterns, or visual representations might play in the formation of risk judgments.<sup>4</sup> If Lennart Sjöberg is right in arguing that "interference with nature" acts as a powerful explanatory variable in public perceptions of gene technology, for example, the question immediately arises what exactly "nature" means for the individuals who invoke this term, and to what extent it might be shaped by the narrative template of the Frankenstein story (in both its book and film versions). As historian Jon Turney has argued in *Frankenstein's Footsteps*, this seminal story exerts a powerful influence on current discourses about genetic engineering. In general, literary and cultural scholars have produced a vast amount of research on the ways basic concepts such as nature, landscape, self and other, and the functioning of the human body in health and illness have been popularly envisioned by means of particular metaphors and stories in different cultures and at different historical moments. It stands to reason that such conceptualizations, which tend to be far more available to the general public than scientific information, play an important role in the selection and evaluation of risks.

Along similar lines, a culturally inflected study of risk perceptions stands to gain from closer attention to the way certain visual images come to function as shorthands for particular dangers and crises. Television viewers have become well familiarized with images of so-called charismatic megafauna—panda bears, mountain gorillas, or whales, for example—that synecdochically evoke the beauty and value of entire ecosystems such as tropical forests or oceans at risk.<sup>5</sup> The oil-covered seabird, as Andrew Ross has pointed out, has come to function as a general icon of environmental crisis (chap. 3, esp. 166, 171–72). Novelist Ron Sukenick foregrounds the power but also the danger of such visual shorthands in his *Mosaic Man*, a novel that ends around the time of the first Gulf War, during which two of the protagonists watch coverage of the war on TV:

Also we see that the Iraqis are releasing oil into the Red Sea, creating an ecological disaster dwarfing the Alaska oil spill. Once again pictures of oil mucked critters dying their slow deaths. Painted in oil, art brute. Totalling our totems. Why is it that it's the exceptional animal that isn't beautiful, especially among the wild ones? SCREEN OFF.

+

Later it turns out that that image of the doomed cormorant trying to escape a pool of oil, played over and over again, is from stock footage. So that even the imagery of truth is deceptive. And what about the images we aren't shown? (252–53)

Sukenick here alludes to the way visual synecdoches can make risk perceptions portable, easy to transfer from one specific context to another, but also to the way they can occlude an understanding of a particular risk scenario as it is being interpreted in terms of images derived from another one. Such issues of representation, to the extent that they are raised by mass media and likely to affect public opinion, deserve to be studied in greater detail.

More situation-specific images sometimes derive from the shaping influence of narrative traditions. In a detailed and very perceptive study, Ferreira, Bohlin, and Löfstedt examine the images that accompanied television coverage of toxic leakage from a tunnel construction project in southern Sweden, emphasizing how these image sequences deliberately created the sense of a pristine agricultural landscape polluted by the spill (285–96). In particular, they foreground how images of milk that had to be poured out because of the contamination conveyed symbolic meanings of innocence and purity that were being undermined by the presence of the toxins. Curiously, however, these authors never once mention the genre of pastoral, which is precisely what gives these images a large part of their communicative power: it is because Western cultures have long traditions of looking upon the countryside as a peaceful, nature-bound, and harmonious counterweight to the corruptions of urban life that evocations of poisoned meadows and milk so powerfully convey a sense of disaster. Narrative genres, as this example suggests, provide important cultural tools for organizing information about risks into intelligible and meaningful stories. But to the extent that such genre templates have a cultural power that can make them override alternative stories that fit less well into existing narrative patterns, they can also shape, filter, and rearrange such information in ways that are not always politically or ecologically benign. Narrative analysis should therefore play an important role in examining the ways risk perceptions are generated by and manifest themselves through various forms of representation, from documentaries and journalism to fiction and poetry.

The study of narrative and metaphorical mediations of risk also contributes to an understanding of important parts of environmentalist discourse itself as a form of risk communication that raises similar questions. To what extent does environmentalist rhetoric translate new technological and ecological risk scenarios into already existing narrative templates, and how does this affect their evaluation? To what extent are existing templates altered or new ones formulated? Lawrence Buell has addressed some of these issues in his analysis of a type of environmental rhetoric

that he labels “toxic discourse,” defined as “expressed anxiety arising from perceived threat of environmental hazard due to chemical modification by human agency” (*Writing* 31). According to Buell, this kind of discourse about a specific kind of risk, chemical contamination, surfaces in the bourgeois and mostly white, middle-class environmentalist movement as well as in the environmental justice movement, which tends to focus on the poor, minorities, and urban populations. Buell diagnoses four major rhetorical components in toxic discourse: a rhetoric of disrupted pastoral that he describes eloquently as a “mythography of betrayed Edens” (*Writing* 37), often accompanied by an individual’s awakening consciousness to the way a pristine environment (or one retrospectively perceived as such) has been contaminated; totalizing images of an entirely polluted world that leaves no escape from the toxins; the moral passion of the weak and politically repressed against those perceived to be strong and politically powerful that is mobilized through a “David vs. Goliath” scenario; and gothic elements that surface in descriptions of deformed bodies and polluted landscapes, especially Virgilian descents to the “underworld” of pollution victims (*Writing* 43–44). As Buell traces some elements of this rhetoric back to nineteenth-century writings about urban blight and others to more recent literary sources, he makes it clear that even the dimensions of toxic discourse that strike one as most realistic have in fact emerged from long traditions of cultural risk representation. But his purpose is not so much to relativize environmental rhetoric by foregrounding its “social constructedness” as to show that it is precisely through these traditions that some stories acquire the power to represent risk in terms that we understand as realistic. The question how such rhetorical traditions filter and shape information about risk so as to postulate certain causal sequences, to make some scenarios plausible and others less so, to make some appear more threatening than others, and to outline likely future courses of events is clearly crucial for both risk theorists and ecocritics.

Buell’s analysis of toxic discourse points the way toward a broader analysis of the rhetoric of environmental and technological risk. Implicitly or explicitly, accounts of risk tend to invoke different genre models, for example the detective story—in the evaluation of clues and eyewitness accounts, and in the discovery and exposure of the criminal; pastoral—in the portrayal of rural, unspoiled landscapes violated by the advent of technology; the gothic—in the evocation of hellish landscapes or grotesquely deformed bodies as a consequence of pollution; the *Biltingroman*—in the victim’s gradually deepening realization of the danger to which she or he is exposed; tragedy—through the fateful occurrence of events that individuals are only partially able to control; and epic—in the attempt to grasp the planetary implications of some risks. Along with the selection of such templates that make risk scenarios intelligible to the reader or viewer in a particular way, narrators have to make choices about which individuals or institutions are cast as protagonists or antagonists in technological

controversies, about where and how to conclude their stories, and about how to characterize their own relationship to their story material (for example, as eyewitness, victim, scientific expert, or journalist).

Buell's study of toxic discourse as a particular form of environmentalist rhetoric also alludes to the question of how risk narratives construct the relationship between particular places and the planet at large. Fear of chemical contamination at a specific site, in many of the writings he analyzes, is linked to a sometimes paranoid vision of an entire world infested by poisons that no human being can escape or protect herself against. He traces this totalizing toxic consciousness back to its most obvious source, Rachel Carson's *Silent Spring*, and beyond that to George Perkins Marsh's *Man and Nature* (1864) and the writings of European colonial officials in the seventeenth and eighteenth centuries who had the chance to observe threatened island ecosystems firsthand (*Writing* 39). This vision of global pollution, Buell notes, ends up functioning as a countermodel to the better-known environmentalist conception of the planet as a holistic, Galian-style system of harmonies and balances:

Toxic discourse calls for a way of imagining physical environments that fuses social constructivist with environmental restorationist perspectives. . . . [T]he nature that toxic discourse recognizes as the physical environment humans inhabit is *not* a holistic spiritual or biotic ecology but a network or networks within which, on the one hand, humans are biotically imbricated (like it or not), and within which, on the other hand, first nature has been greatly modified (like it or not) by *techné*. (*Writing* 45)

This fascinating observation seems to suggest that the kind of environmentalist rhetoric Buell here analyzes has turned its back on the fundamentally pastoral vision of ecology I discussed in chapter 1, a vision that understands ecological systems as harmonious and balanced networks and that sees nature as self-regenerating if left on its own. Yet I am less confident than Buell that the longing for a return to precisely such a naturally balanced world does not inform many of these descriptions of exploited, deformed, and polluted landscapes and bodies as an imaginary countermodel. Calls for "risk-free" environments, undisturbed communities and neighborhoods, pure and "detoxified" bodies, and in some cases, premodern ways of life, in tandem with calls for grassroots democracy, self-sufficiency, and respect for indigenous forms of knowledge that are often articulated in this context seem to spell out a pastoral countermodel to the toxic world. Viewed from this angle, the vision of a terminally polluted planet appears less as an alternative to Lovelockean holism than as a subgenre of apocalyptic narrative, which has played an important role in modern environmentalism from the 1960s onward.

Apocalyptic narrative, by definition, addresses the fate of the world as a whole: it is a particular form of imagining the global. As it was deployed by environmentalist writers in the 1960s and 1970s, it paints dire pictures of a world on the brink of destruction as a means of calling for social and political reforms that might avert such ruination. Unlike biblical apocalypse, in other words, it assumes that the End of the World can in fact be prevented (Garrard, *Ecocriticism* 99), and the destructive intensity of its scenarios is not so much an attempt at accurate prediction as an indicator of the urgency of its call for social change (Killingsworth and Palmer 41). Apocalyptic narrative, in this secular sense, can appropriately be understood as a form of risk perception. Yet to the extent that such narrative, even in its secular version, articulates quite clear-cut distinctions between good and evil, desirable and undesirable futures, it indeed relies on a different mode of projecting the future than theories of risk, which tend to emphasize persistent uncertainties, unintended consequences, and necessary trade-offs. To put it somewhat differently, environmental apocalypses include an ideal socioecological countermodel—often a pastoral one—that discourses about risk typically lack (although Beck's rather idiosyncratic version of risk theory does contain a utopian element that I will discuss shortly).

Since environmental apocalyptic discourse was often dismissed when its predictions did not come true (although, as environmentalists are quick to point out, one reason that they did not come true may well be precisely the fact that these end-of-the-world stories kindled public awareness and galvanized political action) and the rhetoric of risk has become more widespread in public debate, ecocritics have assessed its current relevance in rather divergent terms. Michael Killingsworth and Jacqueline Palmer, in their analysis of "millennial ecology," have traced the genre from 1960s scenarios of nuclear annihilation, pollution, overpopulation, and mass starvation forward to the 1980s, when they see it as reemerging in journalistic as well as scientific warnings about the greenhouse effect. Environmentalist writers at that moment, they argue, were aware that some of the specific predictions of earlier end-of-the-world scenarios had not come true and had thereby put the credibility of environmentalist prognoses in question. They therefore revived the genre with greater caution, and eschewed forecasting anything more than broad trends: nevertheless, global warming has led to a revival and continuation of the genre in their view. Frederick Buell, by contrast, has argued in his tellingly entitled study *From Apocalypse to Way of Life* that the millennial expectation of future crises that prevailed in environmentalist thought and writing in the 1960s and 1970s has given way to the cultural integration of crisis and risk into the experience of the present from the 1980s onward. People no longer fear environmental disasters in the future so much as they "dwell in crisis," as he puts it: that is, they live with an awareness that certain limits in

the exploitation of nature have already been exceeded, that past warnings were not heeded, and that slowly evolving risk scenarios surround them on a daily basis.

Frederick Buell is clearly ambivalent about this shift. On the one hand, he recognizes that a steady drumbeat of gloom-and-doom rhetoric is liable to discourage and alienate individuals more than it incites them to action. On the other hand, he is obviously worried that too much normalization of crisis might lead to an implicit acquiescence to the environmental status quo. Instead of such a "domestication within crisis," he calls for "a way of dwelling actively within rather than accommodating oneself to environmental crisis" (205, 206). What exactly this means in practical terms is not really clear in his account, and he himself notes that precisely the novels that describe the contemporary "dwelling in crisis" without unduly apocalyptic or utopian overtones offer no way out of crisis (322).<sup>10</sup> But his diagnosis of the demise of environmental apocalypse is nevertheless perceptive in its analytical insight. It contrasts with Killingsworth and Palmer's persuasion that apocalypse is alive and well as an environmental genre, and more importantly, it suggests that apocalyptic scenarios differ from risk scenarios in the way they construe the relation between present, future, and crisis. In the apocalyptic perspective, utter destruction lies ahead but can be averted and replaced by an alternative future society; in the risk perspective, crises are already underway all around, and while their consequences can be mitigated, a future without their impact has become impossible to envision.

It is worth emphasizing that this difference does not amount to any fundamental dichotomy. Apocalyptic scenarios are and remain a particular narrativization of risk perceptions, and analyses of risk certainly sometimes include panoramas of large-scale upheaval or disaster: some forecasts of the consequences of current global warming trends are a case in point. The more important difference, I would argue, lies in the way many (though not all) environmental apocalypses continue to hold up, implicitly or explicitly, ideals of naturally self-regenerating ecosystems and holistic communities in harmony with their surroundings as a countermode to the visions of exploitation and devastation they describe. While perspectives grounded in risk analysis tend to outline more or less desirable consequences and futures of certain courses of action, but by definition none that are completely exempt from risk. In a certain sense, the futures that risk analysis tends to project correspond to typically high modernist patterns of narrative in literary analysis in their (implicit or explicit) emphasis on indeterminacy, uncertainty, and the possibility of a variety of different outcomes. This emphasis, however, does not imply that risk theorists necessarily remain noncommittal with regard to specific programs of risk management and mitigation. On the contrary, it is precisely theorists who understand the complexity and uncertainty of risk scenarios as an inherent dimension of modern societies and their

technologies whose agendas in the end turn out to be conceptually closest to those of environmentalists.

### 3. Risk, Complexity, and Modernization

Studies of risk perceptions only rarely invoke the broader sociological and historical theories that focus on the relationship of certain types of risks and risk perceptions to processes of modernization and globalization; conversely, these broader theories tend not to incorporate empirical research on risk perceptions, so that the two fields of inquiry have remained somewhat disjointed. One of the studies that has exerted influence in both areas, however, is Charles Perrow's seminal analysis of "system accidents." In his by now classic study *Normal Accidents: Living with High-Risk Technologies* (1984), Perrow investigates a variety of contemporary technological systems, from dams and mines to marine and air traffic, space exploration, weapons systems, and biotechnology. The most serious risks, Perrow argues, stem from technological systems with such a degree of complexity that even experts cannot understand all the connections and feedback loops they contain, and therefore cannot predict some of their most dangerous failures: System accidents occur when several different and sometimes minor failures in independent but coupled subsystems interact in such a way as to produce failures in the system as a whole. This interaction produces risks that could not have been anticipated by an analysis of the system's normal functioning or of individual subsystem failures. Perrow emphasizes that

If interactive complexity and tight coupling—system characteristics—inevitably will produce an accident, I believe we are justified in calling it a *normal accident*, or a *system accident*. The odd term *normal accident* is meant to signal that, given the system characteristics, multiple and unexpected interactions of failures are inevitable. This is an expression of an integral characteristic of the system, not a statement of frequency. (*Normal Accidents* 5)

Improved designs or better operator training, therefore, will not lead to increased safety, because the complexity of the technology itself will always defeat them.

System complexity and coupling lead from small, unimportant failures—"the banality and triviality behind most catastrophes" (*Normal Accidents* 9)—to large-scale disasters and characterize, according to Perrow, several technologies that were only introduced in the course of the twentieth century but now pose the greatest and most unpredictable hazards for contemporary society. In part, this is because complex systems

are designed in such a way that the banal beginnings of a major accident are often not immediately observable. "In complex industrial, space, and military systems, the normal accident generally (not always) means that the interactions are not only unexpected, but are *incomprehensible* for some critical period of time. In part this is because in these human-machine systems the interactions literally cannot be seen" (*Normal Accidents* 9). Nuclear energy is such a complex and tightly coupled technology prone to system accidents, as Perrow demonstrates in a detailed analysis of the Three Mile Island accident that is, like most of his other case studies, as suspenseful and surprising as many a novel. Complexity and tight coupling are also the factors that generally make nuclear power plants and weapons, in Perrow's view, unacceptable in terms of their risk:<sup>11</sup> marine transport and biotechnology acceptable, with major investments in reducing their risks; and other technologies including chemical plants, air traffic, mining, fossil fuel plants, highways and automobiles acceptable, with relatively minor improvements (*Normal Accidents* 304–5).

Perrow is aware that this evaluation puts him at odds with the usual perspective of risk assessors: "Current risk assessment theory suggests that what I worry about most (nuclear power and weapons) has done almost no harm to people, while what I would leave to minor corrections (such as fossil fuel plants, auto safety, and mining) has done a great deal of harm" (*Normal Accidents* 305).<sup>12</sup> But it is precisely his focus on the structure and functioning of technological systems, he argues, rather than on the consequences of their past performance, that allows a more realistic assessment of their future potential for harm. From this perspective, he concludes, the dimension of "dread" that psychometric investigators of risk perceptions in the 1970s had discovered with respect to certain technologies, and that had seemed to them to derive merely from the public's ignorance and emotionality, actually turns out to have some foundation in reality, since many of the technologies with a "dread risk" factor also rely on interactively complex and tightly coupled systems. In this respect, Perrow points out, his classification meshes more closely with public perceptions of risk than with technical assessments by governmental, corporate, and academic experts (*Normal Accidents* 327–28).

If Perrow here suggests a different lens for the psychometric study of certain kinds of public risk perceptions, his analysis also implies a different approach to the historicity of risk. While theorists with an anthropological approach, including Douglas and Wildavsky, tend to focus more on the mechanisms by means of which cultures select risks for attention than on the nature of the risks themselves, Perrow proposes that with industrialization and, even more markedly, with the technological innovations of the twentieth century, new kinds of risk scenarios have come into being. Qualitatively different kinds of risks, in other words, arise as a consequence of economic and technological modernization processes that cannot simply be equated with risks from, say, the plague, warfare, or natural

disasters in earlier times. The central question for Perrow, therefore, is the development of technological risk scenarios and only secondarily their social construction and perception.

A somewhat broader but related analysis about why risk has become so all-encompassing in contemporary culture emerges from the work of the historian of technology Thomas Hughes. What has transformed modern society, and American society in particular, Hughes argues, is not so much the invention of individual technological principles and devices—such as electricity, the telephone, or the automobile—as the creation of large-scale and extremely complex techno-economic systems by means of which these devices are produced, distributed, and managed. For Hughes, the invention and implementation of these complex technological and organizational networks is the unique contribution of the United States to modern culture. The technological hardware is only one part of such networks, which also include transportation, communications, and information systems, as well as people and institutions with all their organizational, legal, social, and economic structures. Though Hughes does not explicitly frame his argument through theories of risk, he refers to Perrow to argue that these large-scale systems in which technologies are embedded have become so complex that they can no longer be easily understood or controlled, and therefore give rise to risks whose origins and outcomes are extremely difficult to trace and manage (443–72). As chapter 5 will show, this idea forms the narrative nucleus of Richard Powers's novel *Gain*, which portrays in great detail the growth of a chemical corporation as a complex system that ends up distributing toxic products around the globe.

British sociologist Anthony Giddens, whose concept of "disembedding" I discussed in chapter 1, analyzes risk even more broadly in the context of the social transformations that characterize modernization processes. By creating institutions, networks of exchange and expertise that reach far beyond the local, Giddens argues, disembedding mechanisms generate security for vast areas and populations, for example through steady and safe supplies of food, water, and electricity, shared legal conventions, and insurance practices. But they also generate new kinds of risks with sometimes global reach:

All disembedding mechanisms take things out of the hands of any specific individuals or groups; and the more such mechanisms are of global scope, the more this tends to be so. Despite the high levels of security which globalised mechanisms can provide, the other side of the coin is that novel risks come into being: resources or services are no longer under local control and therefore cannot be locally refocused to meet unexpected contingencies; and there is a risk that the mechanism as a whole can falter, thus affecting everyone who characteristically makes use of it. Thus someone who has oil-fired central heating and no fireplaces is particularly vulnerable to changes in the price of oil. In circumstances such as the "oil crisis" of 1973, produced as a result of the

actions of the OPEC cartel, all consumers of petroleum products are affected. (*Consequences* 126–27)

The fact that the disembedding mechanisms characteristic of modernization create networks of both safety and risk also affects the social trust that in Giddens's theory is fundamental for the functioning of modern societies. Trust in the continuous proper functioning of invisible networks of law, expertise, and exchange is the fuel on which the large-scale social systems of modern societies run. Risk scenarios, exceptionally serious or far-reaching ones in particular, put this foundation of trust to the test, since modern networks of information and communication also give rise to widespread awareness of a host of different risks, as well as of the limits of expertise in dealing with them. In addition, modern societies typically do not offer their members easy ways of converting such limits of knowledge or management ability into the certainties of magical or religious conviction (*Consequences* 125). The change in both the kind of risk scenarios that disembedding mechanisms create and the type of risk awareness they give rise to, therefore, leads Giddens to refer to late modernity as a "risk culture" (*Modernity and Self-Identity* 3).

Giddens's writings on risk and trust are clearly influenced by the work of Ulrich Beck, who links the concept of risk even more resolutely to broader theorizations of modernization and globalization. Like Giddens and Scott Lash, Beck postulates that modern societies have entered a phase of "reflexive modernization" in which modernizing processes transform traditional social structures, but those created by earlier waves of modernization.<sup>13</sup> According to Beck, the hazards that are characteristic of this new era can be defined by two criteria: they are themselves the effects of modernizing processes, thereby reflexively confronting modern societies with the results of their own modernization; and some of these risks, such as global warming and the thinning of the ozone layer, are for the first time truly planetary in scope. In his most famous, far-reaching, and speculative claim of the mid-1980s, Beck proposed that risks such as these will lead to a new stage in the evolution of modernity—not to a "postmodern" but instead to a "risk society." While social distinctions and conflicts at an earlier stage of modernity were centrally articulated around the production and distribution of wealth, Beck argues, "in advanced modernity, the social production of *wealth* is systematically associated with the social production of risks. Accordingly, the distribution problems and conflicts of the scarcity society are superseded by the problems and conflicts that originate in the production, definition and distribution of techno-scientifically generated risks" (*Risikogesellschaft* 25).<sup>14</sup> Such new risks reach across existing stratifications to create a new kind of social structure. "Poverty is hierarchical, smog is democratic." Beck sums up his argument in one of the most frequently quoted aphorisms from *Risikogesellschaft* (48).

What he means by this is that the technological development of modern society has reached a stage where it has become unable to protect itself against the unintended "side effects" of its own technologies, which, formerly latent and invisible, are now emerging into full public view. Even as the socially privileged attempt to export such side effects to the less empowered, in the end they cannot prevent these effects from returning to harm them. Ecological crisis, in Beck's view, is a case in point, as it ends up undermining the means by which any population sustains itself—including those who might have originally profited from ecological exploitation (*Risikogesellschaft* 48–50). Excessive pesticide provides an easy example, in Beck's perspective, as it is exported to countries with lax environmental regulations that in turn export their pesticide-contaminated harvests back to the countries who meant to avoid just these chemicals, in a global cycle he calls the "boomerang effect." Of course, buying organic produce may offer a temporary release from this cycle for the affluent; but when soil, air, and drinking water are polluted, even the socially privileged are increasingly impacted by risks that affect the foundations of life. And if some risks are deliberately moved across national borders, others travel around the globe without anyone's conscious intention: even the remote lakes of Canada turn acidic, and the forests of northernmost Scandinavia die from acid rain. An atomic bomb is, in Beck's view, the clearest example of a risk that makes no distinction at all between rich and poor: the ecological crisis, according to him, works in a more gradual and delayed fashion, but ultimately has a similar effect (*Risikogesellschaft* 50).

All this does not imply that Beck denies the increased risk exposure that material disadvantage entails at the present moment. He frequently emphasizes, in what may seem like a contradiction to his quip about the "democracy of smog," that "there is a systematic 'force of attraction' between extreme poverty and extreme risks" (*Risikogesellschaft* 55). This is because he does not see the risk society as a fully established social pattern, but as an emergent one that at the moment overlaps with the structures of the modernist scarcity society. His point, in other words, is not that the increased number and scope of modern risk scenarios have already overridden existing social inequalities, nor that they will lead to an egalitarian society, but that they will eventually lead to a rearticulation of inequalities on a different basis. "One thing is clear. Endemic uncertainty is what will mark the lifeworld and the basic existence of most people—including the apparently affluent middle classes—in the years that lie ahead" (*World Risk Society* 12). In this context, he highlights the ambivalence of what he calls the "individualization" of life stories, that is, the idea that the course of people's lives is becoming increasingly less predictable in terms of their social origins: while this individualization (which, he emphasizes, is identical neither with "individualism" nor with "individualism") may have emancipatory implications in some respects, "the expression 'pre-

carious freedoms' denotes a basic ambivalence between the cultural script of individual self-fulfillment and the new political economy of uncertainty and risk. All too swiftly, the 'elective,' 'reflexive' or 'do-it-yourself' biography can become the breakdown biography" (*World Risk Society* 12). This nuance is worth bearing in mind: rather than arguing that people from different social strata will be equally affected by particular risks (though that may be the case in some contexts) or that current social structures will give way to a determinate new social architecture, Beck's main point is precisely the unpredictability of current risk scenarios, and as a consequence, the idea that social status will not in the future function as a reliable indicator of risk exposure. As I will argue in chapter 5, it is possible to read Don DeLillo's novel *White Noise* as a fictional engagement with precisely the realization that risk scenarios are becoming unmoored from conventional class distinctions.

While Beck's book gained enormous popularity in western Europe in the late 1980s and in the United States throughout the 1990s, it also came under attack for a variety of reasons, including its conceptualization of modern "reflexivity" and its neglect of risk taking as a positively valued and sometimes pleasurable experience. Most importantly, sociologists have pointed out that little empirical evidence exists to support Beck's claim that social categorizations are indeed in the process of being rearticulated around issues of risk. But even some of his critics admit that the interest of Beck's argument may be polemical rather than descriptive: it is not really necessary to accept wholesale his theory of a fundamental social shift to see the force of his argument that risk is becoming one important area of sociocultural concern and conflict.<sup>15</sup>

For an environmental perspective, Beck's theory presents curiously ambivalent challenges. On the one hand, Beck radicalizes environmentalist claims about technological and ecological risk by turning them into a set of ineluctable global conditions and making them the very principles on the basis of which societies around the globe will have to reconfigure themselves. Lawrence Buell has highlighted this dimension of Beck's work by labeling him "the Rachel Carson of contemporary social theory" (*Future* 5). But in a sense, Beck's is an even more extreme vision of the impact of ecological crisis on social structure than many of the scenarios proposed by the apocalyptically minded environmentalists of the 1960s and early 1970s, in that it predicts the advent of a new kind of society that cannot really be averted. Even if one takes this claim somewhat less than literally, as I mentioned, the concept of a world risk society bolsters environmentalist claims about the increasing social importance of technological and ecological risk scenarios. Beck's criticism of the role scientists have sometimes played in ignoring or covering up such dangers, as well as his diagnosis of the general failure of established social and political mechanisms to deal with some of the new risks, concurs with environmentalist views.

On the other hand, Beck's most fundamental claim, that modern social structures shaped by conflicts over the distribution of wealth will be replaced by stratifications originating in differential vulnerability to risk, does run counter to the perspectives that have been formulated around the concept of "environmental justice." In the view of environmental justice advocates, technological and ecological risk scenarios superimpose themselves on and help to reinforce existing structures of social inequality, in that the world's poor and racial or ethnic minorities tend to be disproportionately exposed to risk, as well as, in quite a few cases, women. The status of the disenfranchised in the international economy—their places of residence and types of work—the argument runs, typically exposes them to hazards from which the more affluent mainstream has better means of sheltering itself. From the location of dangerous industries and toxic waste disposals all the way to the quality of building materials and foodstuffs they have access to, the poor and underprivileged receive a greater portion of the risks and a smaller share of the benefits than the more privileged social strata. Indeed, as Guha and Martinez-Alier have emphasized in their studies of environmentalist movements in India and Latin America, poor and indigenous communities often confront the risk of seeing their own, sustainable ways of exploiting local ecosystems displaced by the unsustainable practices of large corporations that sometimes operate with government support (6–11). Beck's aphorism "Poverty is hierarchical, smog is democratic" is anathema from this perspective. And even if a particular threat presented itself similarly to two socially different populations, their means of mitigating its impact would still set them apart: Bangladesh and the Netherlands may, by virtue of their topographical characteristics, be exposed to similar hazards from rising sea levels, but their socioeconomic means of countering this threat differ significantly.

One might be tempted to diffuse this difference by pointing precisely to some of the passages I quoted earlier in which Beck highlights the attraction between poverty and risk. But doing so would obscure what is, in my view, a genuine and deep-seated difference of social vision between the two approaches. Environmental justice advocates tend to see the current global ecological crisis in its manifold manifestations as a logical consequence and exacerbation of a socioeconomic organization based on capitalism, and of an approach to knowledge shaped by the rationalism of the Enlightenment; only a genuine social revolution against these existing structures, in their perspective, will remove the underlying causes for the destruction of the natural environment. Beck, by contrast, sees in the same ecological crisis a sign of the disintegration of the capitalist class society and of modernist approaches to knowledge. Far from intensifying existing social inequalities, global risk scenarios will gradually undermine them. In this view, the revolution is already underway, though in a very different fashion than the one usually envisioned in socialist politics.

This contradiction seems to me difficult to resolve if we take Beck's claims *au pied de la lettre*: while the diagnosis of the status quo overlaps in the two approaches, the underlying social analyses differ significantly. If one takes Beck's analysis somewhat less literally as highlighting the important role that risk scenarios have begun to play in social conflicts, however, the tension diminishes. Indeed, one could argue that the rise of the environmental justice movement is itself evidence of just this role. And when one considers just how the transition to something like a "risk society" might actually occur, the struggles carried out by the environmental justice movement may well turn out to be one crucial part of such a shift. Risk theorists who currently study global environmental hazards, at any rate, address issues of environmental justice as a crucial part of their investigation, and have begun to develop the concept of "vulnerability," defined broadly as "differential susceptibility to loss from a given insult" as a hinge term in their analyses (Kasperson et al., "Introduction" 24).<sup>16</sup> By the same token, Beck's own cosmopolitan vision of new social communities arising from transnational risk scenarios, to which I will turn next, has a great deal of affinity with the increasing internationalism of the environmental justice movement.

#### 4. Risk, Globalization, and the Cosmopolitan Imaginary

The theories of the relation between risk and modernity proposed by Perrow, Hughes, Giddens, and Beck, among others, foreground how experiences of risk are imbricated in far-flung ecological, technological, economic, and social systems that operate across a variety of scales from the local to the planetary. Beck's concept of the "world risk society," indeed, represents one of the most important recent ways of imagining the global from an environmentalist perspective. Lawrence Buell has gone so far as to envision Beck as the latter-day counterpart of James Lovelock, in that Beck turns Lovelock's theory of Planet Earth as a self-sustaining, harmoniously balanced feedback system upside down into a theory of a world thrown permanently off-balance by the unintended and uncontrollable consequences of technological development (*Future* 90). Considering the lasting influence of the Gaia hypothesis on environmentalist thought and culture, one would expect such an inversion of global vision to have similar reverberations in the realm of the local and the everyday.

Indeed, in what for a cultural critic may well be one of the most intriguing facets of his theory, Beck examines the awareness of pervasive risk in its impact on modes of everyday reasoning. Some contemporary risk scenarios, unlike those of earlier eras, he claims, challenge conventional modes of perception and experience through their "mediatedness" or "second-handness" (or what other risk theorists would call "social amplification and attenuation"). Most individuals, even many scientists and

engineers, cannot identify and analyze such scenarios on their own, in a process he calls "expropriation of the senses"; given the complexity and specificity of contemporary technological hazards, only highly specialized experts can examine them, while the majority of scientists are as non-expert as laypersons. In Beck's view, the fact that knowledge about risks comes in such highly mediated form to the overwhelming majority of individuals leads gradually to a transformation in the logic that structures everyday experience:

In order to perceive risks as risks and to make them a reference point for one's own thought and action, one has to *believe* in fundamentally invisible causal connections between conditions that are often substantially, temporally and geographically far removed from each other, as well as in more or less speculative projections... But that means: the invisible, more than that: that which as a matter of principle cannot be perceived, that which is only theoretically connected and calculated becomes... an unproblematic component of personal thought, perception, experience. The "experiential logic" of everyday thought is, so to speak, turned upside down. One no longer only induces general judgments from one's own experiences, but instead general knowledge that is not based on any experience becomes the determining center of one's own. Chemical formulae and reactions, invisible toxins, biological circuits and causal chains must dominate vision and thought to lead to active fighting against risks. In this sense, risk awareness is not based on "second-hand experience," but on "second-hand *non*-experience." Even more pointedly: ultimately *no one* can know of risks if knowing means having consciously experienced them. (*Risikogesellschaft* 96)

As opposed to, say, epidemics of contagious diseases, with which human societies have been familiar for millennia, modernization and globalization create risk scenarios with no known precedents in Beck's analysis. No one can forecast with certainty, for example, what the cumulative health effects might be of dozens of different toxic substances in our daily surroundings, each one at a level officially considered acceptable, but never assessed in combination. Neither is it easy, even for experts, to predict the long-term consequences of large-scale risk scenarios such as climate change or loss of biodiversity. Yet all of us, Beck points out, have come to live with a daily awareness and indeed expectation that these types of risks form part of our ordinary environment: toys of the kind I described at the beginning of this chapter, representing people in protective suits and gas masks that have come to form part of children's normal inventory of toys, indicate one of the earliest stages of initiation into daily life in the risk society.<sup>17</sup>

Obviously, this logic of "secondhand experience" and "secondhand nonexperience" can also be expected fundamentally to transform modes of spatial belonging and inhabitation. Indeed, the change in experiential logic that Beck describes, in which insights and incidents from other places

and facets of expert knowledge come to reshape everyday reasoning, can be understood as one form of deterritorialization as I discussed it in chapter 1. Deterritorialization, as I pointed out, involves the detachment of cultural practices from their anchoring in place and their reconfiguration in rural practices in other places as well as other scales of spatial experience. Some of this transformation brings about alienation, social uprooting, economic displacement, cultural unease, or psychological discomfort, but some of it may also entail welcome new forms of connectivity, new choices, and a general broadening of existential horizons. Risk scenarios, especially those that do not originate locally but at the national, regional, or global scale, contribute to deterritorialization processes as they prompt individuals and communities to reconfigure their practices of inhabitation in relation to these larger sociospatial scales.

Such reconfigurations come in a wide variety of changes and adjustments that have been examined across vast portions of the social scientific literature on environmental impacts. Most obviously, risk perceptions can either intensify or break individuals' and communities' bonds to a local place. In the first case, the desire to protect an area from danger may deepen residents' affective attachments to it, or victims of a local hazard may pull together to eliminate it or defend themselves against its consequences by a variety of means (including, of course, the well-known tendency of early environmentalism toward NIMBYism that sought to ward off risks from one's own backyard without close attention to the risk scenarios this displacement might generate in other communities). Conversely, the perception of danger can break inhabitants' bonds with a place and prompt them to move away, or stigmatize a site to such a degree that its material as well as aesthetic and cultural value decreases.<sup>18</sup> More indirectly, risk perceptions affect ways of inhabiting, using, or enjoying a place through transformations of daily habits or social customs. Local inhabitation is sometimes consciously and sometimes unconsciously, sometimes subtly and sometimes manifestly shaped by risk perceptions relating to a variety of concerns, including food sources or ways of cultivating land that are chosen with pressures from ecological depletion or market demands in mind; patterns of mobility that are shaped by perceptions of what people and places are dangerous or safe; distinctions that are drawn between activities and products that are "clean" or "dirty," "pure" or "polluted"; and processes and institutions of governance and surveillance that are designed to prevent or manage particular dangers.

Some of these adaptations to risk are short-lived responses to a temporary threat, as when food scares involving bovine spongiform encephalopathy in Britain or avian flu in Germany over the last decade prompted people to change their diets or seek out different food providers, or when news about severe acute respiratory syndrome in 2003 led tens of thousands of travelers to cancel travel plans to East Asia and Canada. Others involve more permanent changes in ways of life, such as the switch from

trawling to more sustainable kinds of fishing in some parts of the world due to fears of fish stock depletion, or changes in building, heating, or waste disposal practices in view of risks from resource exhaustion or contamination. One would expect the more permanent changes to be associated with more deep-seated cultural transformations; yet temporary crises and disasters of the kind I mentioned earlier, even if they are quickly resolved, sometimes propitiate more long-lasting conceptual and cultural changes, as I will show in more detail in chapter 6.

A similar multivectoral causality characterizes local and translocal risk scenarios in their impact on forms of inhabitation. Strictly local hazards can at times resonate culturally and politically far beyond their limited geographical domain, according to the logic of "secondhand experience," as in the case of Love Canal, which led to community activism against toxic waste disposals in many other regions of the United States and beyond. Regional and global risk scenarios fall into at least two distinct categories that involve local perception and experience in quite different ways. In Turner et al.'s useful distinction, *systemic risks* such as climate change or the depletion of the ozone layer arise from systems that are global in scale, so that if they undergo change anywhere, the system as a whole is affected. *Cumulative risks*, by contrast, derive from the planet-wide summation of local changes that end up affecting large portions or even the totality of a global environmental phenomenon or resource. Cumulative risks result either from their global distribution, as in the case of groundwater depletion or biodiversity loss, or from the magnitude of their impact on a global resource, for example in the case of agricultural soil depletion or deforestation. Systemic risks can result from human activities that are not themselves global, while cumulative risks do tend to derive from very widespread processes ("Two Types" 15–16). For the purposes of my discussion here, this distinction matters because cumulative global risk scenarios tend to be perceptible at the local scale in a way that systemic ones are not, or only with a far longer delay. As a consequence, the perceptual, cognitive, and ultimately cultural mechanisms by means of which such systemic risks are addressed can be expected to differ substantially from those pertaining to cumulative ones.

It might seem intuitively plausible that in the case of cumulative risks, locally perceptible signals of environmental change—shortages of water, erosion of arable soil—would make it easier to conceive of regional and global risks that result from the multiplication of such changes. A form of inhabitation attuned to local changes in nature, in other words, might seem to offer an obvious gateway to the understanding of larger-scale risk scenarios—and that is indeed, as I showed in chapter 1, the basis for many environmentalist calls for a return to the local. Yet even in the case of cumulative risks, cultural awareness does not always follow such a direct trajectory. Tim Gallagher, in the description of his long quest for the extinct ivory-billed woodpecker that finally led to the rediscovery of one

specimen in 2004, provides an interesting example of local awareness actually blocking the perception of more large-scale risk. Gallagher mentions his repeated visits to old-growth cypress forests resembling those of the southern United States in the nineteenth century, the preferred habitat of the ivory-bill, and dwells on his feelings of mourning and loss over the massive logging that eliminated most of this landscape. One of his sources, an elderly man from Louisiana, remembers asking loggers about the most inconceivable magnitude of this forest destruction in his youth:

When Greg was young, he talked to every old logger he could find and asked them about the old days there. Many times they would say, "You should have seen it when the big trees were here." And he would get frustrated and ask them, "Why did you cut them down if you liked them so much?" The answer was complicated. Most of the loggers were isolated, with no connection to any other group. Times were hard, the money was good, and there were thousands and thousands of trees. How could it ever end?

The loggers seemed to have no idea that dozens, if not hundreds, of other crews were out there cutting away. Many came from other states—Mississippi, Arkansas, Texas—to take part in the harvest. And the logging continued right up till the end of the 1920s. "They were surprised when there were no more trees to cut," said Greg. "So that was that." (138)

This account is an intriguing example of a case in which detailed local knowledge apparently not only failed to lead to any awareness of the cumulative regional risk scenario but in fact prevented such awareness in the absence of more mediated information about the larger context. Beck's claim about the crucial importance of highly mediated information for the understanding of modern risk scenarios here confirms itself in a somewhat unexpected way: in this case, it is not so much that mediated information provides knowledge that cannot be obtained on the evidence of the senses as that it establishes the connection between perfectly perceptible evidence and the more elusive ecological systems to which it points.

The texts I will analyze in chapters 5 and 6 negotiate this question of how an awareness of risks at different scales of the local, regional, and global transforms ordinary modes of language, narrative, and thought through their novelistic scenarios. DeLillo's protagonist Jack Gladney provides an example of an individual confronting a perceptible local risk scenario with imperceptible consequences for his health and life expectancy. Powers's Laura Bodley encounters a less tangible local risk that rami-fies into a global one in ways that are not quite captured by the distinction between systemic and cumulative risks, as the pesticide that perhaps caused her cancer turns out to be produced by a multinational chemical corporation with branches around the globe. The protagonists of Wolf's and

Wohmann's novels, situated in post-Chernobyl East and West Germany, experience the more subtle forms of deterritorialization that a large-scale regional disaster imposes on them. All of these novels are concerned with distinctively modern risk scenarios (though they have not always been interpreted in this way) and explore how cultural practices of inhabitation are transformed through risk scenarios that link the local in various ways to risks and institutions encompassing large regions or the planet as a whole. In the process, they also experiment with the different ways such risk experiences might be translated into narrative form and arrive, as I will show, at quite different conclusions.

The distinction between systemic and cumulative risks not only raises the question what purchase local experience has on global ecological systems but also how such a distinction relates to social networks based on risk. Many of the nonfictional texts on individuals and places exposed to ecological and technological threats, as well as quite a few of the fictional ones, centrally rely on the assumption that the experience of risk is detrimental to social cohesion: at the same time, risk in these texts sometimes brings about a collective social impulse that leads to political action as well as to a more deeply experienced local community. As Lawrence Buell has pointed out, environmental justice discourse in particular tends both to presuppose the existence of tightly knit historical communities with long traditions, and to fashion communities that seem to have coherence only in the face of risk, such as the residents of a certain ZIP code (*Writing 4.1*). Especially in the last two decades, the environmental justice movement has also increasingly attempted to forge international alliances between communities at risk, in the hope of creating global coalitions that might be able to resist the power of multinational corporations and, in some cases, institutions of international governance such as the World Bank or the International Monetary Fund.

From a different political perspective, the assumption that risk-sharing can generate new forms of community and political agency has led Beck to postulate the rise of what he calls a new kind of cosmopolitanism:

*Risk-sharing* or a "socialization of risk" ... can ... become a powerful basis for community, one which has both territorial and non-territorial aspects ... Post-national communities could thus be constructed and reconstructed as communities of risk. Cultural definitions of appropriate types or degrees of risk define the community, in effect, as those who share the relevant assumptions. "Risk-sharing" further involves the taking of responsibility, which again implies conventions and boundaries around a "risk community" that shares the burden. And in our high-tech world, many risk communities are potentially political communities in a new sense—because they have to live with the risks that others take. There is a basic power structure within world risk society, dividing those who produce and profit from risks and the many who are afflicted with the same risks. (*World Risk Society* 16)

This argument is not in essence so different from some claims of the environmental justice movement, except that Beck is less interested in the idea of already existing communities and their confrontation with risk than in the possibility of emergent communities and political agents that he envisions as explicitly transnational. In his perspective, such risk collectives hold the promise of transcending NIMBYist tendencies, not just through temporary action coalitions but also by becoming the building blocks of a new cosmopolitan culture, quite different from the official institutions of cosmopolitan democracy on which political scientist David Held and others have based their theories of global citizenship. This risk-based cultural solidarity, which Beck takes to be more important than bureaucratic processes and institutions, ultimately harkens back to Marx and Engels's vision of an international working class:

Without a politically strong cosmopolitan consciousness, and without corresponding institutions of global civil society and public opinion, cosmopolitan democracy remains, for all the institutional fantasy, no more than a necessary utopia. The decisive question is whether and how a consciousness of cosmopolitan solidarity can develop. The *Communist Manifesto* was published a hundred and fifty years ago. Today, at the beginning of a new millennium, it is time for a Cosmopolitan Manifesto. The *Communist Manifesto* was about class conflict. The Cosmopolitan Manifesto is about transnational-national conflict and dialogue which has to be opened up and organized.... The key idea for a Cosmopolitan Manifesto is that there is a new dialectic of global and local questions which do not fit into national politics. (*World Risk Society* 14–15)

In his writings during the 1990s, Beck saw these questions taking shape in what he called a global “subpolitics” that unfolds both above and below the scale of the nation-state, involving actors such as nongovernmental organizations and a variety of institutions and citizens’ initiatives whose role he perceives as increasingly important in the coming world risk society. In his more recent work, the idea that interdependencies arising from risks related to ecology, economy, and terrorism enforce the shaping of a cosmopolitan political order moves center stage: rather than “subpolitics,” global risks in this perspective reconfigure mainstream politics itself. *Der kosmopolitische Blick* (The cosmopolitan perspective: 2004) explores the consequences of this shift both for politics and for sociological methodology.

As my main concern here is with the cultural articulations of cosmopolitanism, I cannot delve deeply into the political models that such an approach to cosmopolitanism might generate. Yet Australian political scientist Robyn Eckersley, in an original and lucid account, has explored in far greater detail than Beck what political structures an ecological democracy that thinks beyond national boundaries might aim to build, and her approach is at least worth mentioning here. Eckersley’s concept of “transnationally oriented green states” (202) situates itself in between

two models of transnational democracy: Jürgen Habermas’s model of supranational communities and institutions modeled on the nation-state, whose democratic structures rely on the “communitarian” principle of belongingness or membership, and David Held’s model of global democratic structures based on the “cosmopolitan” principle of affectedness, according to which individuals should not be ruled by norms to which they have not given their consent (Eckersley 173).<sup>19</sup> Eckersley pursues a model

that remain[s] mindful of the insights of communitarians while also moving practically toward the ideals of cosmopolitans. Without knowledge of and attachment to particular persons or particular places and species, it is hard to understand how one might be moved to defend the interests of persons, places, and species in general. Local social and ecological attachments provide the basis for sympathetic solidarity with others: they are ontologically prior to any ethical and political struggle for universal environmental justice. Most environmental activists intuitively understand this and work from the premise of our unavoidable social and ecological embeddedness in particular places and communities. Yet it is impossible to arrest the growing gap between those who generate ecological problems and those who suffer the consequences, along with the increasing dis-embeddedness brought about by the processes of economic globalization, without developing sympathetic solidarity with environmental victims wherever they may be located. The transnationally oriented green state takes the next step and offers practical democratic procedures for ecological citizenship within and beyond the state. (190)

In her exploration of what political procedures and structures might enable such a transition from an ethic of proximity to an eco-cosmopolitan ethic (in the vocabulary I suggested in chapter 1),<sup>20</sup> Eckersley proposes that instead of projecting comprehensive transnational political institutions and structures,

it is quite possible and feasible to transnationalize democracy in piecemeal, experimental, consensual, and domain-relative ways. Such an approach would enable the practical negotiation of principles in response to particular transnational problems, rather than a priori. Formal democratic space-time coordinates would still need to come into play for the proper enactment of legal norms and for the substantive enjoyment of ecological citizenship rights in transboundary environmental domains, but these coordinates would not necessarily be the same for all domains.... Such a project would thus entail building upon, qualifying, and supplementing (rather than replacing) the principle of belongingness with the principle of affectedness. (192–93)

Eckersley here provides a general outline, filled in with more detail elsewhere in her discussion, of how transnational risk scenarios (as well as

other ecological conflicts) might become the points of departure for new forms of democracy.

Beck's vision of an international risk-based solidarity, by comparison, hovers on the border between the descriptive and the normative, between a realistic account of current political conflicts and the projection of an ideal development that is itself based on more than a little utopian thinking. Yet to the extent that one is willing to concede the usefulness of utopian models, this tendency may be less problematic than Beck's simplistic assumptions about the relationship between risk and culture. From much of the risk-theoretical work that I have surveyed in this chapter, Beck takes the important insight that the experience of risk only takes on meaning within particular cultural contexts and assumptions. But from this general insight he seems to infer that shared risk automatically implies enough cultural commonality to serve as the basis for new kinds of communities. The experiences of environmental justice advocates who have actually tried to forge such alliances, however, tell a more complex story that highlights "barriers such as differences in language, culture, education, class, and access to resources" (Kiefler and Benjamin 233). Risk communities in the developing world, as Kiefler and Benjamin show, often retain vivid memories of colonialism and neocolonialism and therefore sometimes react with wariness or suspicion to the overtures of environmental groups in the developed world. At the same time, differences in basic cultural habits such as how to advance a conversation, what kinds of knowledge to rely on, or how to act politically exacerbate the difficulties in creating effective action coalitions, let alone more long-lasting transnational communities of risk (234–35). Shared risk, in other words, remains only a first stepping-stone, so long as it is not accompanied by a more comprehensive cultural literacy that allows the members of one community to grasp what sociocultural significance the risk scenario has for the members of another.<sup>21</sup>

Beck's vision of a cosmopolitan consciousness and an alternative global culture that might arise from the politics of shared risk, then, needs to be complemented by the more acute sense of sociocultural differences that emerge in stark relief from the fieldwork of environmental justice activists. Yet it is also true that the environmental justice movement has often focused primarily on the urgencies of political action, mobilization, and coalition-building, with no in-depth attention to the shaping influence of different cultural frameworks of understanding. While the movement has sometimes drawn on the insights of feminist, postcolonial, and critical race theory, it has done so mostly by reconfirming central assumptions of these bodies of theory rather than showing how the context of communities exposed to ecological, economic, and technological endangerment might transform some of these foundations. As environmental justice scholar T. V. Reed has argued, "the environmental justice movement, as currently constituted, has often worked with a rather thin sense of culture and has not utilized cultural workers as much as it might" (153).

Rather than a sophisticated theoretical framework for approaching questions of crosscultural understanding and misunderstanding in an ecological context, the accounts of environmental justice fieldwork offer a rich inventory on which such a theory needs to draw in order to elaborate Beck's approach to the relationship of risk and the emergence of cosmopolitan forms of solidarity. By contrast, the attempts of anthropologists, sociologists, philosophers, and literary critics to reinvision cosmopolitanism as an effort at crosscultural literacy, which I discussed in chapter 1, do offer such a more nuanced account. These recuperations of cosmopolitanism consciously situate themselves in the unequal political and economic playing fields created by various types of globalization, though they do not, for the most part, concern themselves either with the nonhuman world or the global environmental risk scenarios I have been chiefly concerned with here. As I proposed earlier, an environmentally inflected cosmopolitanism needs to combine sustained familiarity and fluency in more than one culture with a systemic understanding of global ecology that goes beyond environmentalist clichés regarding universal connectedness and the pastoral understanding of ecology that informed earlier kinds of modern environmentalist thinking. The merit of environmental justice activism along with Beck's more sweeping vision of new forms of solidarity emerging out of global risk scenarios is their analysis of how such an ecocosmopolitanism might link experiences of local endangerment to a sense of planet that encompasses both human and nonhuman worlds.