

## Chapter Eleven

### ENVIRONMENTAL AWARENESS

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#### THE EMERGENCE OF ENVIRONMENTALISM

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In this chapter we turn from grand challenges to the search for solutions and the imposing tasks that face a world that values sustainable development but is deeply ambivalent about how to achieve it. In the chapters to come, we will look at environmental problem solving using the mechanisms of government and politics, markets and economics, technology, and changes in consumption. All of these approaches to problem solving are based on the awareness that a problem does exist, and this rise in awareness is the subject of this chapter. It may seem incredible to imagine a society in which environmental impacts were not widely perceived as problems, but the United States was such a society within the memory of people now living.

It isn't that environmental damage was not visible earlier. In the 1950s, the air and water in many cities was dirty; mines and logging left scars on the land; and some species had nearly vanished, such as the egrets of the Florida Everglades and the bison of the Great Plains. Moreover, people appreciated the aesthetic value of landscapes, as evidenced by the creation of large national parks, an idea pioneered in the United States. What was missing was a society-wide awareness that certain production and consumption practices were altering, and often damaging, elements of the natural world that did not have to be destroyed. What was missing was an understanding that pressures of human origin were imposing drastic and often unwanted changes on nature—an understanding, both cultural and political, that we now call environmentalism.

Environmentalism asserts the need for competence—not just to exploit nature, but to manage and preserve portions of the natural world in a sustainable fashion. This is the competence discussed in Chapter 10, a competence often lacking in the world without edges. Environmental awareness, the notion that nature and its fabric of ecosystems should be taken seriously in human affairs, was embraced with astonishing speed the world over. Within a decade of the publication of the popular and influential book *Silent Spring*, the United Nations (UN) convened its first Earth Summit, the UN Conference on the Human Environment in Stockholm, Sweden, in 1972 and created a permanent agency, the UN Environment Programme, headquartered in Nairobi, Kenya.

In this chapter, we examine the American roots of this global change in awareness by looking at three influential people: Rachel Carson, Aldo Leopold, and David Brower. They taught people to see nature and humans in a different way—a way that revived and went beyond the ideas of the Transcendentalists and Hudson River School. The environmentalists' ideas went beyond changing people's perceptions of nature, spurring citizens to organize and governments to respond.

Environmental awareness and its model of social action, which we called classical environmentalism in Chapter 1, is one of the distinctive ways in which the United States has been a cultural innovator and leader in the past century. For more than a generation, classical environmentalism has defined the way the world is rethinking and reworking the relationship between humans and landscapes. This

### Learning Objectives

When you have finished studying this chapter, you should be able to

- describe how warnings from scientists and citizen outcry sometimes lead to environmental reform;
- identify attempts to apply the land ethic at different levels of social organization—from your own actions or those of your family, to nongovernmental organizations such as a campus sustainability task force, local governments, corporations, national government, international organizations, news media, and social networks;
- understand and evaluate assertions that environmental risks are being taken into account adequately in the choices made by businesses, governments, and individuals;
- explain the claims of a nongovernmental organization (NGO) about its mission, and whether the remedies advocated by the NGO really protect ecosystem services and produce better governance of a commons;
- analyze the activities of an organization, such as the college you attend, in terms of its grasp of the land ethic.

achievement has been both conceptual and social, and it is as remarkable as the changes that emerged from the civil rights and women's movements in the same decades in the second half of the twentieth century. Indeed, environmentalism played a central role in a historical period that recalled the Progressive Era of the late nineteenth and early twentieth centuries, when voters and politicians believed that expert knowledge could be harnessed to achieve a shared public interest. This was the time when the U.S. Food and Drug Administration was created to safeguard the food supply, when the Federal Reserve was created to regulate the money supply, and when women won the right to vote. As we stated in Chapter 1, classical environmentalism is incomplete as a strategy to move toward sustainable development, but the classical approach remains vital and important today, as we will explain in the discussion of environmental politics in Chapter 12.

Classical environmentalism involves an implicit theory of social change, linking the ability of science to identify changes in environmental conditions to the capacity of citizens to press for policy responses to human pressures on ecosystems. The rise of environmental awareness set the stage for NGOs such as the Environmental Defense Fund, founded in the 1960s, to take action on the concerns articulated by Rachel Carson.

Environmental awareness is a necessary component of the institutional changes that lead toward sustainable development. As we set out in Chapters 1 and 3, long-term shifts in human behavior grow from and are maintained by shifts in rules governing human actions—shifts in institutions. Sometimes, these rules are explicit and formal, such as the pollution control regulations we will examine in Chapter 12. Sometimes, the rules are informal, and heeding them becomes habitual for most people. Over the past half century, littering has become an unacceptable form of social behavior among many people, just as smoking has. Usually, there are both formal changes and informal ones. For instance, recycling is more common now than it was in the 1960s, but this is partly because bins for collecting recycled bottles and paper are much more widespread as a result of formal decisions to provide them. Environmental awareness is a foundation for these and other institutional changes, and this is why we begin a search for solutions by looking at how a culture comes to understand that environmental problems are waiting to be tackled.

## THE LAND ETHIC

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Aldo Leopold, born in 1887, completed his most influential work, *A Sand County Almanac*, shortly before he died of a heart attack while fighting a brush fire on his farm, just northwest of Madison, Wisconsin, in 1948. In this

book of short essays, Leopold articulated the idea of a **land ethic**, which continues to shape both environmental concern and the search for sustainable development.

A Yale-educated forest ranger who grew up in Iowa, Leopold became the first wildlife management professor in the United States in 1933, during the dark days of the Great Depression. In 1935, he became one of the founders of The Wilderness Society, which is still a leading environmental group.

Early in his employment with the U.S. Forest Service, Leopold was assigned to a program that sought to eradicate wolves. It was so successful that the deer that the wolves preyed on increased dramatically in numbers, until they ate all the plant foods available and starved. This unforeseen outcome gave Leopold a new understanding of how populations interact in ecosystems. This led, in turn, to thoughts about the human role in landscapes and to a striking revision of the instrumentalist view of nature that guided the Forest Service at the time. Instead of thinking about ecosystems as a source of economically valuable natural resources, Leopold wrote, it was important to understand how humans, too, might be considered part of ecosystems. Nature, he argued, was not just a storehouse of meat, crops, and fiber for humans to use. It is more importantly a community to which we belong, one in which we have responsibilities to exercise.

This perspective meant that ideas about property—ideas that had shaped the American consciousness since colonial times, as we discussed in Chapter 2—needed to be reconsidered. Here is the opening passage of Leopold's essay entitled "The Land Ethic": "When god-like Odysseus returned from the wars in Troy, he hanged all on one rope a dozen slave-girls of his household whom he suspected of misbehavior during his absence."<sup>1</sup> Leopold's point was that—in the eyes of Odysseus' contemporaries—this hanging was not a moral issue. Instead, the girls were viewed as property who were not afforded the human rights that we (like Leopold) now take for granted. If they had betrayed their master while he was gone (for twenty years!), then they were to be disposed of by hanging. One should feel no more compunction about it than one would feel about junking an old refrigerator that could no longer keep food cold.

As Leopold proceeded to argue, we no longer think slavery is a permissible form of human relationship. Our conceptions of right and wrong can change in ways that often broaden our sense of community and reciprocal obligation—a point Garrett Hardin also brought up in his analysis of the commons discussed in Chapter 3. Leopold argued that we were at the threshold of a change in our view of the relationship between humans and ecosystems. "The land ethic," he wrote, "simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land."<sup>2</sup> That is, we need to think of the land—or ecosystems, as we would now say—as an object of ethical attention rather than only as property (Fig. 11.1).



**FIGURE 11.1**  
Martin Johnson Heade, *Newburyport Meadows* (1872–79). A view of the land ethic—humans peacefully inhabiting a landscape.

Two generations after Leopold wrote his essay, we have yet to achieve that transformation in ethical perspective, even if the pace and scale of change so far is notable. His book continues to be influential because respect for ecosystems is now acknowledged as important for individuals and the world. Yet neither the land ethic nor the actions to carry out its imperatives could be said to be in place. Although there is widespread acceptance of the need for effective environmental policies, commitment to them remains shallow. More important, the scale of competence of many of our institutions falls short of being able to realize environmental protection sustainably, or at all. This shortfall, in turn, disheartens people, tempting many to wonder whether any institution can do the job. Yet the actual record is not as discouraging as a lot of politically inspired talk suggests. We have described the substantial progress in many areas while describing the grand challenges in Part II; we will see more reasons for hope and determination in the chapters to come.

### **“A THING IS RIGHT . . .”**

Leopold recognized the world without edges: “Your true modern is separated from the land by many middlemen, and by innumerable physical gadgets. He has no vital relation to it; to him it is the space between cities on which crops grow.”<sup>3</sup> What does this lack of “vital relation” to the land mean? In the language of this book, we would say that the world without edges leads people to forget that they

still rely on landscapes and ecosystem services, both far and near. The consequence of forgetting this is that humans modify ecosystems, and then we are surprised when those modifications go too far:

In human history, we have learned (I hope) that the conqueror role is eventually self-defeating. Why? Because it is implicit in such a role that the conqueror knows, *ex cathedra*, just what makes the community clock tick, and just what and who is valuable, and what and who is worthless, in community life. It always turns out that he knows neither, and this is why his conquests eventually defeat themselves.<sup>4</sup>

This caution is one you see in the concern for biodiversity, a warning to be careful of nature's complexity. Leopold himself made the same point, through a question: "Who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering."<sup>5</sup> In environmental policy, this idea is called the **precautionary principle**. When there is good reason to believe that an action may harm humans or the environment, those who advocate for that action should bear the burden of proof to demonstrate that the risks are acceptable, given the benefits—keeping in mind that risks and benefits often accrue to different groups in society. The 2010 oil spill in the Gulf of Mexico is only one illustration of the degree to which the precautionary principle fails to be applied in judging economic activities, sometimes with dire consequences for both the business enterprises involved as well as for the ecosystems harmed by those activities.

Leopold's call for a land ethic that "simply enlarges the boundaries of the community" to include ecosystems is of course radical. We have spent more than half a century, so far, working on that word "simply." The implications of such an ethical stance remain far from the practices of an industrial economy: "a land ethic changes the role of *Homo sapiens* from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such."<sup>6</sup>

The world without edges is a world of human-dominated ecosystems, in which domination amounts to conquest of the land-community. In that world, we are still discovering what it means to be "plain member and citizen." We are trying to preserve land in national parks, and conservation biologists now strive to protect ecological processes such as migration and evolution. Industry and government have made many changes in manufacturing processes and regulations to decrease pollution of water and air. Some are now acting to slow global climate change and to respond to world trade as it spreads exotic species and extends the demands of consumption. Many people now recycle. All of these are ways of exercising citizenship.

define American culture in places like Grosse Point, Michigan (outside Detroit), Bellevue, Washington (near Seattle), Fairfax, Virginia (next to Washington, D.C.), and the Los Angeles basin.

For more than a decade, the land ethic lay far outside the mainstream of American life, even as the industrial economy that provided abundant goods for the American lifestyle led to more and more pollution. By the late 1950s, brown smog regularly hung in the air of Southern California. In 1969, the heavily polluted Cuyahoga River near Cleveland, Ohio, had so much oil and grease floating on its surface that the river caught fire. That same year, a large oil spill in the Santa Barbara Channel put images of fouled beaches and oiled birds on television screens across the United States. But by then, change was under way.

## **SILENT SPRING**

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Rachel Carson's book *Silent Spring*, published in 1962, launched the contemporary environmental movement. She wrote at a pivotal time. Up until World War I, half or more of the industrial products in the United States were made from renewable resources—plants and animals. This began to change with the growth of the oil and chemical industries in the 1920s and 1930s, but their growth was slowed by the Great Depression in 1929. The economy then accelerated during and after World War II. The war—fought near the end of Leopold's life—was the real beginning of a phenomenal change toward a world that, at least for American consumers, would be dominated by plastics, synthetics, and a dizzying array of new chemicals. During the war, whole new classes of synthetic chemicals—including some developed for chemical warfare—were found to be highly effective weed and insect killers. The manufacturers also enjoyed strong government backing, and within ten years synthetic pesticides had captured 90 percent of the agricultural pest-control market.

Carson was twenty years younger than Leopold. She was trained as a marine biologist and spent the early part of her career as a writer in the U.S. Fish and Wildlife Service, a rare woman in the male-dominated world of federal science. Pressed by family responsibilities, she tried to earn additional income as a freelance writer. It was a tough go until her book, *The Sea Around Us*, appeared in 1951. This book stayed on the best-seller lists for well over a year, won the 1952 National Book Award, and enabled Carson to retire from the government bureaucracy to devote all of her time to writing.

She also began to take an interest in all of those new pesticides. In a three-part series of articles published in the *New Yorker* magazine in 1962, Carson spelled out her concerns. The articles were entitled "Silent Spring," and they were subsequently published as a book. This title pointed to what she felt was an unsettling

and unnoticed side effect of pesticides: DDT, the best known insecticide, interfered with the ability of some birds to form eggshells. As a result, eggs broke before the chicks could survive on their own. This is the problem that nearly drove the bald eagle extinct, as we saw in Chapter 1. The result, Carson warned, would be the loss of the songbirds that delighted her and millions of suburbanites every spring. A silent spring would be the unintended consequence of careless applications of pesticides. And the consequences would not be limited to birds. Indeed, as the critique of industrial chemicals widened, the focus came to lie on the risk that chemicals would cause cancers in humans. Today's regulations are aimed almost entirely at protecting our own species rather than wild birds.

It is a sad irony that Carson herself died of cancer in April 1964. But already in that spring when her voice fell silent, the message she had sent had ignited a public debate that continues today. *Silent Spring* resonated with the sensibilities of a growing suburban middle class, bringing environmental ideas into the mainstream of American politics.

Carson chose her audience well. The *New Yorker*, a publication read by affluent consumers from well-to-do, cosmopolitan cities and suburbs, only had a few employees from chemical manufacturers among its readers, and they tended to be executives far removed from the production plants where the pesticides were produced. Not many farmers read the *New Yorker* either; they were firmly against pests and most were in favor of pesticides.

Carson reached a well-educated population, many of them suburbanites who had moved to the country after World War II. Theirs was an American dream sketched along the lines of the pastoral imagery of the Hudson River School a century earlier (see Chapter 2). But unlike the rural figures in the Transcendentalists' paintings, twentieth-century homeowners were deeply enmeshed in the world without edges. They had little knowledge of or sympathy with heavy industries such as chemicals manufacturing or commercial agriculture. They lacked a "vital relation" to industry or commerce, and they were attached to their land for reasons of beauty rather than the material ecosystem services they derived from their surroundings. Their attachment was not much like the appreciation that a farmer or hunter might have of the natural world, an appreciation that Leopold sought to enlarge into an awareness of the biotic community.

Unlike the civil rights battles that erupted soon after *Silent Spring* appeared, environmental politics did not demand that people change their lives in painful ways. The costs of complying with the environmental laws inspired by *Silent Spring* turned out to be modest; perhaps more important, careful research has shown that the benefits of these policies considerably exceed their costs. In an economy that was expanding rapidly, new sewage treatment facilities and pollution control equipment on cars, power plants, and factories all increased taxes and prices, but these were hardly noticed by consumers. So Carson's appeal was easy to



embrace. Like the Hollywood screenplays that they watched, in which the drama of righteous democracy was enacted, concerned environmentalists could demand action from government and expect a positive reception from federal officials. The attitude toward government in that era of the Great Depression and World War II was that government's role was to help and to protect its citizens. The anti-tax, anti-bureaucrat anger of the 1980s and 1990s still lay decades in the future.

Smoldering pollution problems could be found in many metropolitan areas and were steadily growing with the expanding economy. Some people were ready to act, including government officials who were eager to solve problems for well-educated, middle-class voters. And Carson ignited a movement and brought a new word into the American lexicon when she wrote, "this is a problem of ecology, of interrelationships, of interdependence."<sup>9</sup>

We poison the caddis flies in a stream, and the salmon runs dwindle and die.  
We poison the gnats in a lake, and the poison travels from link to link of  
the food chain, and soon the birds of the lake margins become its victims.  
We spray our elms and the following springs are silent of robin song, not  
because we sprayed the robins directly but because the poison traveled, step  
by step, through the . . . elm leaf - earthworm - robin cycle.<sup>10</sup>

One can see [here](#) a portrayal of Leopold's land-community, in which humans were ignoring their responsibilities as plain members and citizens.

## CLASSICAL ENVIRONMENTALISM

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What did Rachel Carson achieve in *Silent Spring*? First, as she had done successfully in *The Sea Around Us*, she explained biology in terms a layperson could understand, spelling out how toxins kill or impair cell function. The life of a cell, she observed, unfolds through chemical reactions steered by enzymes:

When any of these enzymes . . . is destroyed or weakened, the cycle of oxidation within the cell comes to a halt. It makes no difference which enzyme is affected. Oxidation progresses in a cycle like a turning wheel. If we thrust a crowbar between the spokes of a wheel, it makes no difference where we do it, the wheel stops turning. . . . The crowbar . . . can be supplied by any of a number of chemicals commonly used as pesticides..<sup>11</sup>

The impacts on cells could also affect genes: "Some of the defects and malformations in tomorrow's children . . . will almost certainly be caused by these chemicals that now permeate our outer and inner worlds."<sup>12</sup> Moreover,

the parallel between chemicals and radiation is exact and unmistakable. The living cell assaulted by radiation suffers a variety of injuries: its ability to divide normally may be destroyed; it may suffer changes in chromosome structure; or the genes, carriers of hereditary material, may undergo those sudden changes known as mutations, which cause them to produce new characteristics in succeeding generations. If especially susceptible the cell may be killed outright, or finally, after a lapse of time measured in years, it may become malignant.<sup>13</sup>

Carson linked the toxic chemicals in pesticides to cancer and radiation, two of the most feared cultural symbols of that time. In 1962, atmospheric testing of nuclear weapons was in full swing, and radioactive elements were found in milk, raising concerns about their potential to wreak harm. And the very success of medical science and public health had revealed novel threats:

... a drastic change has come about in the nature of our most serious public-health problems. Only yesterday, mankind lived in fear of the scourges of smallpox, cholera, and plague—scourges that once swept nations before them. Now . . . sanitation, better living conditions, and new drugs have given us a high degree of control over infectious disease. Today we are concerned with a different kind of hazard that lurks in our environment—a hazard that we ourselves have introduced into our world as our modern way of life has evolved.

The new environmental health problems are multiple—created by radiation in all its forms, born of the never-ending stream of chemicals . . . now pervading the world in which we live. Their presence casts a shadow that is no less ominous because it is formless and obscure, no less frightening because it is simply impossible to predict the effects of lifetime exposure to chemical and physical agents that are not part of the biological experience of man.

“We all live under the shadow of a haunting fear that something may corrupt the environment to the point where man joins the dinosaurs as an obsolete form of life,” Dr. David E. Price, of the United States Public Health Service, has said. “And what makes these thoughts all the more disturbing is the knowledge that our fate could perhaps be sealed twenty or more years before the development of symptoms.”<sup>14</sup>

This last point brought forward the second major theme of *Silent Spring*. The threats to human life and the quality of life signified by songbirds were invisible and delayed. It might be too late if we waited for the full impact of careless pesticide use to become apparent. These were threats against which we have no evolved defenses

because the chemicals do not exist in nature. They were threats with which we had little experience, because the widespread use of pesticides was so recent. We had to rely on the findings of biochemists and geneticists. This meant that science would be an indispensable source of warnings—the premise of classical environmentalism.

Pesticides were disturbingly ubiquitous, even in suburbia. “We have seen that they now contaminate soil, water, and food, and that they have the power to make our streams fishless and our gardens and woodlands silent and birdless.”<sup>15</sup> That garden chemicals might carry risks to gardeners and their children was unsettling, particularly to women. In addition, pesticide residues were found in the food supply, as some still are today. The threat was pervasive.

Here, a third theme entered: a government all too ready to lull the public into a false sense of security. “To the question ‘But doesn’t the government protect us from such things?’ the answer is ‘Only to a limited extent.’”<sup>16</sup> Carson’s careful explanations of the biochemistry of toxicity brought lots of new information to her readers, and it made her point that “Little is done . . . to warn the gardener or homeowner that he is handling extremely dangerous materials.”<sup>17</sup> Instead, she charged, “the Food and Drug Administration . . . promotes a completely unjustified impression that safe limits have been established and are being adhered to.”<sup>18</sup> Even now, governments’ acquiescence in environmental pressures from forest clearing in Indonesia to climate change to foods contaminated with salmonella remains a potent driver of citizen concerns.

Carson concluded:

There is still a very limited awareness of the nature of the threat. This is an era of specialists, each of whom sees his own problem and is unaware of or intolerant of the larger frame into which it fits. It is also an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged. . . . It is the public that is being asked to assume the risks. . . . The public must decide whether it wishes to continue on the present road, and it can do so only when it is in full possession of the facts.<sup>19</sup>

Environmental surprises from nuclear meltdown to the loss of endangered species are still described in the terms that Carson articulated (Fig. 11.2).

*Silent Spring* expressed the classical model of environmentalism. Science—a wide-ranging, integrative natural science explained in terms that a layperson can understand—warned of subtle dangers. In the technological progress that emerged from World War II lay invisible, delayed, distant, indirect threats to human health and the high quality of life that Americans had moved to the suburbs to find. The cure was an awakened citizenry who would press government to impose effective regulations. This would force commerce and industry to find better solutions.

*Silent Spring* introduced to its readers the idea of natural controls and organic means of controlling pests. The idea that solutions were available that could deliver



**FIGURE 11.2**  
Fukushima  
Daiichi nuclear  
plant, burning  
and releasing  
radioactivity,  
after the plant  
was crippled by a  
massive tsunami  
in March 2011.  
The accident is  
one example of  
the threats to  
the environment  
and humans  
implicit in a large  
technological  
economy—threats  
that accompany  
the benefits often  
taken for granted.

a high quality of life to people meant that environmental protection could be achieved with little or no sacrifice.

Of course, the chemical industry disagreed vehemently. The risks were exaggerated, they charged, and the costs of doing without pesticides were underestimated. They also attacked Carson personally, doing so with a degree of ferocity that few scientists had ever experienced. An industry trade group, the National Agricultural Chemicals Association, spent more than \$250,000 (equivalent to roughly 6 times that much money today) to attack the book and its author.<sup>20</sup> She was also attacked, notably, for being a woman. For one man who wrote a letter to the *New Yorker*, for example, it was not enough to claim that “Miss Rachel Carson’s reference to the selfishness of insecticide manufacturers probably reflects her Communist sympathies, like a lot of our writers these days.” Moreover, he sneered, “As for insects, isn’t it just like a woman to be scared to death of a few little bugs!” And, just to make clear where he stood, he fumed, “She’s probably a peace-nut too.”<sup>21</sup> The pattern in which an entrenched industry attacks the credibility of its critics, rather than the substance of the critics’ arguments, is one that has since been seen with increasing frequency.

The battle had been joined, however. The activist group that soon became the Environmental Defense Fund was founded by several scientists on Long Island, amid the suburbs of New York City, in 1967. By 1972, DDT had been banned by

the federal government's newly formed Environmental Protection Agency, in part due to the Environmental Defense Fund's criticisms. Still, environmentalists did not win all of their battles, and the kinds of fierce resistance that Rachel Carson sparked from many American businesses have by no means died away.

## ENVIRONMENTALISTS

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*Silent Spring* was a book about the chemicals that were being sprayed on farms and suburban yards. But classical environmentalism was much more: a way of thinking about social action that described what activists like David Brower were doing already. Brower, who lived until 2000, made his biggest mark in the 1960s as executive director of the Sierra Club. The Sierra Club had been founded by naturalist John Muir in 1892, and it had attracted hikers and climbers to its vigorous outdoor activities. Under Brower, however, it was the indoor sport of politics that made the club *the* quintessential environmental group—the one cited by angry industrialists and government officials and embraced by thousands of people who discovered the environment as a cause in the years after Carson's book came out. Brower went on to found Friends of the Earth, which built a network of environmental activist groups in many different countries, and the League of Conservation Voters, a lobbying organization known and feared in Congress that has played a key role in such issues as fighting proposals to drill for oil in the Arctic National Wildlife Reserve.

What was Brower doing? His Sierra Club campaigns fought to preserve dramatic landscapes against government development. These were scenic places on public lands, including national parks, that a suburban, automobile-driving society began to visit on family vacations in the 1950s and to care about. He lampooned a federal government claim that flooding part of the Grand Canyon would bring tourist benefits by bringing people closer to the rock formations on the canyon wall. The government, he snorted in a newspaper ad, would flood the Sistine Chapel so that the tourists could see Michaelangelo's ceiling better. That sense of humor, combined with a sharply satirical attack on bureaucratic buffoonery, made environmental activism fun. The sense of fighting a good fight resonated with the gathering mood of rebellion and irreverence in the 1960s.

David Brower was not alone. His activism drew upon and contributed to the confrontational mood of the 1960s and its emphasis on community-based activism. The environmental group Greenpeace, founded in Canada in 1971, has been a leading exponent of a confrontational approach imitated by other NGOs. The Natural Resources Defense Council, founded in 1970, emphasized litigation and pioneered the field of environmental law, now a major specialty of legal practice. The Environmental Defense Fund, also a creative proponent of the lawsuit as a

means to advance environmental protection, later branched out into sophisticated activism to reform the environmental behavior of businesses. These and other innovations drew ideas and contributed models to a notable period of social activism, in which civil rights, women's rights, and investigative journalism all came to make an enduring mark on American culture.

Environmental NGOs also flowered at the local level, often drawing upon people's sense of place to oppose development projects such as a new Walmart store or to press for cleanup of an industrial site contaminated with toxic chemicals. What may be most significant, though, is that concerns as different as the survival of whales and polluted air all came under a single umbrella: environmentalism.

## SCIENCE AND CITIZEN-BASED ACTIVISM

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What environmentalists shared was science, loyalty to places, and a belief in the power of citizen action. These were the ideas of classical environmentalism, and they were organized around the ideas of Leopold and Carson.

Unlike social movements anchored in outrage against injustices, environmentalism was initially grounded in an ecological perspective, although issues of justice were raised at the time of the first Earth Day, and they have taken on increased significance in recent years. Human activities take place in a complicated, dynamic, largely invisible natural world, and what we do, on purpose and accidentally, affects the web of life. Advocates for declining species and biodiversity see themselves as speaking on behalf of a natural world that goes unheard, and one can see in their statements a strong component of protest. But mixed in with the indignation is a dose of education designed to explain to their opponents and a wider public why endangered species or important habitats matter to people. Environmentalists combat ignorance and indifference as much as they must overcome prejudice or greed.

The word "ecologist" morphed from its original and still primary meaning of a scientist who studies the relationships among species, into a synonym for environmentalist. Washington State's environmental protection agency is called the Department of Ecology.

The ecological perspective Carson articulated entered the public imagination in a lasting way. Beyond politics is the growing market share of organic produce, the practice of recycling, and ecotourism. We do not live in a society that has outgrown Carson's critique, any more than we have settled the racial divisions that were rearranged (but not settled) by the Civil War. Yet one can say that notable progress has been made in both environmental protection and racial justice.

Ecology, the web of life, and the notion that humans should be "plain citizens" of the land-community were unfamiliar ideas in the 1960s. They entered a culture

dominated by an industrializing economy of strong, hierarchical institutions. This was a culture that took pride in being “modern” and scorned the old-fashioned and outmoded. The ecological image was interpreted, as cultural values shifted, as a metaphor for a more decentralized, less hierarchical vision of community order, an order in which history matters and the past has value.

Putting ecology in this cultural light provides a striking contrast to the ideas of Social Darwinism that emerged a century earlier. In that earlier caricature of evolutionary biology in popular culture, it was ruthless competition that seemed to be ratified by nature. “Nature, red in tooth and claw” was a way to justify the pursuit of capitalism without heeding the needs of workers.<sup>22</sup> Aldo Leopold asserted, instead, that nature was better seen as a community than a field of combat, a community whose integrity and beauty should be respected in human ethics. In a pattern that simultaneously brought added energy and increased criticism to the activists, environmentalism seemed to challenge earlier ways of thinking; Carson was a respected scientist, but she was attacked as a communist and as a person who didn’t care about “practical” realities.

Both Leopold and Carson stressed the importance of recognizing inadvertent harms and the ignorance of the would-be conqueror of the natural order. Greed was as much overenthusiasm as evil, in this reading, and the cure lay in reform rather than revolution. The path of reform, in turn, lay with the same scientific community that had split the atom, invented DDT, and developed ecology.

What was needed was a scientific understanding of risks. This, too, was an unfamiliar notion. Sometimes, scientists warned us, environmental science could not be expected to provide clear, cut-and-dried answers because damage from toxic chemicals or overfishing did not have symptoms that could be seen immediately, or even all that clearly in the longer term. Rather than showing up as quickly as the mosquitoes that fell out of the skies after a neighborhood was sprayed with a cloud of DDT, the crowbar in the spokes of the wheels of life would silently erode the ability of the mother bird to lay eggs strong enough for her chicks. Trawling the oceans to remove fish would also undermine the food sources of whales, and the burning of fossil fuels would eventually start to melt glaciers on the other side of the planet. None of this was apparent, or could even be understood by direct perception. Instead, technically sophisticated measurements that were collected, assembled, and interpreted by the patient methods of science were indispensable. Yet the assertions of these latter-day oracles, hedged and qualified in the reserved language of probabilities and uncertainty, have now become the basis for large economic decisions and wrenching political choices. By the 1980s, the Environmental Protection Agency had reorganized around the ideas of **risk analysis**, and the agency reinterpreted its regulatory mission as one of managing and lowering environmental risks.

The idea that industrial society carried new kinds of risk was recognized in the 1960s. People knew about industrial accidents and about workers losing their jobs

involuntarily, a possibility dramatized during the Great Depression. *Silent Spring* extended this idea to nonhumans: “non-target” species such as bees are affected by pesticides, Carson pointed out, and she also drew attention to ecological damage such as reproductive failure in songbirds.

In the decades since *Silent Spring*, business has increasingly co-opted scientific risk assessment. The tendency now is for conservative critics of environmentalism to stress “sound science.” Too often, this phrase turns out to mean that unknown risks should be presumed to be negligible—products are innocent until proved guilty—and that the precautionary principle is an unreasonable interference in business decisions. This is a shrewd strategy. Science rarely provides definitive answers in advance, so if an industry can forestall regulatory enforcement until there is definitive proof that its products are guilty, then the firm may be able to evade enforcement for a very long time, as was demonstrated by the big tobacco firms. The pattern is so common now, and so effective, that it may even deserve its own name—the “scientific certainty” argumentation method, or SCAM.

In addition, as was the case with Rachel Carson, environmentalists are attacked as unscientific extremists who are driven by emotions and who do not care about the economy. There is plenty of emotion among environmentalists, to be sure, but a lot of it comes from a sense of cherished places being violated, threats to human health from invisible toxins, pollution, drastic changes in land use, and the loss of symbolically important species such as redwood trees or eagles. The logic of industrial expansion and world trade has been one that views nature as a collection of resources to be harnessed and of places located along routes of trade and production. Environmentalism provided a language to criticize and resist this utilitarian perspective.

What environmentalism has sometimes failed to do is to take seriously the ideas in Chapter 4 on disproportionality—the fact that many of the most serious forms of environmental harm are not due to economic prosperity, writ large, but originate from a surprisingly small fraction of economic actors who actually create significantly more harm, per dollar, than other companies in the same industry. Environmentalists have constructed many articulate critiques of “industry” and “the economy,” but few environmentalists to date appear to have written so eloquently about an industry in which the majority of the harm is actually done by just one or two of the facilities. Perhaps the most painful aspect of disproportionality is the continuation of environmental injustice (see Box 11.1: Environmental Justice, page 304).

Although science occupies a central place in environmentalism, so do nonexpert citizens, as well as characterizations of those environmentalists by their opponents. This is a political claim: the environment is a commons, part of the public space, and hence is subject to the authority of a democratic government and the will of its people. Even when they may be ignorant by the standards of experts,