there. Thus the urge to comprehend the entire geology of British North America also helped define an entity that might logically find political expression.

In Canadian usage science was seldom perceived simply as a tool for material ambitions. Like the Scots, Canadians saw science as way to learn about and develop their resources, but—with the American Revolution and their own rebellion of 1837 always in the back of their minds—they defined the objective of prosperity as a contented and orderly society. Egerton Ryerson's educational activities illustrate even more explicitly the concept of science as social glue. A reformer, Methodist clergyman, and superintendent of schools in Upper Canada, he argued for the extension of the public school system, for science teaching in it, and for the creation of meteorological stations at each grammar school. This effort linked Ryerson with Lefroy, an Anglican and political conservative, in a campaign to collect magnetic and meteorological data across British North America. By employing the telegraph Ryerson envisioned "a storm alarm on a stupendous scale," as well as climatological data useful for the extension of agriculture into undeveloped parts of British territory. In his view, this sort of collective effort in the public interest mediated the conflict between sectarian groups and political opponents, creating "a bridge from the individual to the community and from the community to the nation."

In Zeller's interpretation practical applications are not a subverted form of science pursued only in places without enough wealth or leisure for the real thing but an instrument linking theory to the concept of community. Botany, for example, also had immediate relevance for agriculture and forestry. Just as Logan understood that geological data on valuable minerals were the honey to attract capital, Ryerson and others realized that agricultural potential lured settlers. But in its theoretical form botany also served the idealization of nationhood. The concept of geographic distribution became a metaphor for Canada's future development, with variation in nature as the way to describe the growing sense of the country's cultural differentiation from England. In this model, Canadians were in the process of forming a North American variation of the English nation, a hardy northern people ready to compete with the United States in the exploitation of the continent, but without renouncing their British heritage. This was the kind of thinking that led Ryerson to propose, on the visit of the Prince of Wales in 1860, that all native-born Canadians wear maple leaves in their lapels as a symbol of their unity.

We have been taught to think that economic and social forces are the determinants of nationhood. Suzanne Zeller aims to enrich our understanding of that process, and she does so in a way that shows us how science can be made an integral part of the story, too.

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An Environmentalist Lineage

The Rights of Nature. A History of Environmental Ethics. RODERICK FRAZIER NASH. University of Wisconsin Press, Madison, 1989. xiv, 290 pp. $27.50. History of American Thought and Culture.

In his preface Roderick Nash, a professor of both history and environmental studies, represents his history of environmental ethics as a work of scholarship untainted by advocacy. This is a claim, however, that is belied throughout the text. His respectful treatment of the most extreme advocates of environmental ethics and his virtual neglect of their critics make clear his true position. In his epilogue, a labored comparison of the rights-of-nature movement with the anti-slavery movement, Nash's identification with the former becomes very nearly complete. A few *perhaps*es notwithstanding, the real message of this book, as the author himself puts it, is that "changes in ethics seldom occur peaceably." His theme, in short, is how violence advances morality—not at all what most people have in mind when they think of environmentalism.

By now everyone recognizes that nature constitutes a diminishing resource that must be husbanded to meet the needs of future generations. Many also agree that aspects of it having no practical use ought to be saved anyway if they are beautiful or awesome or in some other way possess desirable qualities. Few concerns are of greater importance today, but they are not what Nash has written about. His subject is the school that holds that the utilitarian approach to conservation, here called "anthropocentrism," is wholly inadequate. By viewing nature in terms of its relation to mankind, anthropocentrism denies the larger truth, which is that the natural universe has intrinsic rights equal to those of human beings. This doctrine, which Nash calls "biocentrism" or, more often, "deep ecology," has profound, not to say dangerous, implications.

Biocentrism has a short history. The notion that cruelty to animals is wrong seems to date from the 17th century, but Nash does not find much awareness of the rights of nature as such before the 1800s, and it is not until the 20th century that environmental ethics really takes wing. Its key figure is Aldo Leopold, best known as the author of *A Sand County Almanac* (1949). In that book Leopold advanced the idea of biotic right, the concept that everything on this planet, including soil and water, is ecologically equal to man and shares equally in "the right to continued existence." In thus rising above utilitarianism, Nash says, Leopold became the "most important source of modern biocentric or holistic ethics."

Few subscribed to biotic right until the 1960s, when, in common with so many other radical ideas, it suddenly gained attention. But after the '60s "bioethics" did not die out. Instead it has flourished to a remarkable degree. As described by Nash the movement takes two different forms, though individuals may participate in both. On the level of theory there has been a proliferation of books, articles, and indeed whole journals devoted to "ecophilosophy," "ecotheology," and as many related subjects as the neologist can devise.

Judging from Nash's quotations bioethical literature seems to be marked by a competition to see who can make the wildest statements. Thus one theologian writes that "human beings transgress their divine authority when they destroy or fundamentally alter the rocks, the trees, the air, the water, the soil, the animals—just as they do when they murder other human beings." There is much ethical hairsplitting as to which is worse, for example, to wantonly kill an innocent blossom or in self-defense to slay an armed attacker—flowercide, needless to say, being the greater offense. And why not, since, in the words of another writer, man is the "tyrant species"? At its most absurd, bioethics leads to such conclusions as that put forward in what Nash calls a "landmark" essay by a "perceptive philosopher" who argued that a proposed ski resort should not go up because building it would violate the rights of the valley where its construction was to take place—thus assigning to terrain a privilege that even humans do not enjoy.

On the practical level these ideas are acted upon by a number of groups that have moved beyond such established organizations as the Audubon Society and the Sierra Club into more perilous waters. They include the Sea Shepherd Conservation Society, which sinks whaling vessels, the Animal Liberation Front, notable for its destruction of laboratories and facilities employed in animal research, and Earth First, whose adherents spike trees so that if milled they will disable saws and possibly their operators. These crimes are rationalized on the

ground that just as it took violence to abolish human slavery, so also is violence necessary to free enslaved species.

The fatal flaw in all this tortured reasoning is the assumption that nature possesses human qualities and must be treated on that basis. Nash unwittingly exposes this anthropomorphism by attempting to equate environmental saboteurs with abolitionists, each group being represented as at the "cutting edge" of liberalism in its respective century. But the analogy makes no sense unless nature has the same rights as human beings, which, outside the hothouse atmosphere of bioethics, few will be willing to grant. Further, while in one mode Nash attempts to depict extreme environmentalists as Lockean liberals, he also portrays them as Leninists, breathing revolutionary fire and brimstone in the service of all creation. "Radical" and "revolution" are two of his most frequently used words and, indeed, stripped of their political meanings are also appropriate in the sense that to revolutionaries the ends justify the means.

Recently an animal rights defender allegedly tried to murder the president of a firm that manufactures devices used in animal research. This incident recalls the 1960s, when good intentions proved for some to be a stage on the road to nihilism. It may also remind us of John Brown, who, in the best of causes, committed frightful acts. Though Nash does not recognize the distinction, there is a world of difference between terrorism and civil disobedience. One might suppose that a book about ethics would take note of it.

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Ethical Dissent in a New Mode

The Whistleblowers. Exposing Corruption in Government and Industry. MYRON PERETZ GLAZER and PENINA MIGDAL GLAZER. Basic Books, New York, 1989. xvi, 286 pp. $19.95.

The 1980s have produced a dismaying procession of revelations of serious misconduct in every major institution of U.S. society. While those the public most often suspects of wrongdoing—greedy businessmen and politicians—have certainly provided their share of scandals, no sector of society remains unsullied. Educators, scientists, other professionals, and even religious leaders have also been caught violating the public trust. The apparent universality of ethical lapses makes this a book for everyone.

The story Glazer and Glazer tell—how it happens that certain courageous people expose wrongdoing at great personal cost—carries important lessons and warnings about failures of accountability in all sectors of society. Their account is both credible and compelling; their data come from extensive personal interviews and detailed historical documentation. Their scholarly aim is broad—to analyze the emergence, workings, and consequences of whistleblowing in the United States.

They begin by identifying the preconditions that gave rise to this particular form of ethical resistance. Courageous dissent was not new. What was new about the whistleblowing movement was that a continuous stream of dissenters succeeded in capturing the attention of key policymakers and the public. Glazer and Glazer suggest that a variety of social and political developments in the 1960s and 1970s legitimated public disclosure of wrongdoing and gave those who reported it the belief that reform was possible. These included the success of the protest movements of the 1960s, the exemplars provided by early reformers like Ralph Nader and Frank Serpico, the support of key members of Congress and the press, the emergence of legislation to protect whistleblowers, and the formation of a network of organizations supporting them. All helped and encouraged the whistleblowers.

The key factor Glazer and Glazer identify as triggering much of the conduct whistleblowers exposed was the growth of regulation in the public interest, which made many traditional business practices illegal and imposed new costs. The business community vigorously resisted—publicly, by political lobbying and support of selected candidates, and privately, by evasion, stalling, failure to comply, and concealment. Glazer and Glazer suggest that a "new level of corporate lawlessness" emerged (p. 13). The suggestion seems plausible, but they do not present convincing data to document it. Whether the incidence of corporate misconduct or just the reporting of it increased is unclear.

For most readers the most interesting part of the book will be the analysis of what motivated the whistleblowers the authors studied and what happened to them after they had exposed wrongdoing. Glazer and Glazer interviewed 64 whistleblowers and their supporters over a six-year period, following many of them from the early stages of their resistance to its aftermath. All of those interviewed met a rigorous definition of whistleblowing that included moral motives, reasonable evidence, a serious danger to the public, and attempts to solve the problem internally.

Perhaps the biggest surprise in this book is that these whistleblowers were initially conformists and believers in the very organizations they later exposed. They usually assumed that when upper management knew what was going on it would be stopped; they only went public after they had tried all available channels within their organizations to correct the abuses they saw and found management unresponsive or protective of the wrongdoers. They became radicalized when management turned on them in retaliation rather than gratitude. The extent of the reprisals management unleashed against them and of the economic and social harm the whistleblowers and their families suffered as a result is shocking.

Glazer and Glazer seem to assume that the reasons managers retaliated are self-evident, with self-protection paramount. Behavioral scientists and management scholars will find this part of their analysis weak. Because their data come primarily from the protesting side of these particular incidents, they do not really know why the managers involved acted as they did.

For many purposes, it doesn't matter. The managers involved can be viewed as in some sense responsible for the wrongs in question. But to discover ways to change such behavior, we may need to understand why it occurred. Like other human beings, managers are subject to perceptual distortions, cognitive biases, and group pressures; in their managerial roles they must depend on others for information and often suffer from role overload. Glazer and Glazer's account does not inform us about the degree to which these and other factors figure in managerial misconduct and resistance to reform.

Their interviews led Glazer and Glazer to conclude that the belief systems of whistleblowers played a crucial role in their motivation. They do not specifically address whether they think managerial beliefs also help to explain managerial actions. The beliefs whistleblowers acted upon sometimes came from religious and ethical upbringing; in other cases they were based in a strong identification with a profession and its ethics. Sadly, the reference groups from which their beliefs were derived generally failed to support them in their whistleblowing. Most of the practical and emotional support they received came from public interest groups, members of the press, a small number of