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II

Just Environmental Business

HOLMES ROLSTON III



I. INTRODUCTION

Since business began, some ways of making money have been judged morally unacceptable. But only in the last two decades has business been pressed to cope with environmental prohibitions. Consider for instance the following cases, and notice how what may first seem to be routine and non-moral environmental matters, just business, turn out to involve deeper ethical puzzles about what is just in business. Notice too that the justice we are here called upon to think through is not abstract and impractical; it concerns everyday affairs in the business world.

§1 CASE STUDIES

Case 1. Allied Chemical Corporation, operating an eastern Virginia plant, was charged with intentionally violating environmental protection laws by releasing Kepone into local waters. Denying the charges, the firm pleaded no contest, but was fined \$13.2 million, the largest fine ever imposed in an environmental case. Judge Robert R. Merhige, Jr., wrote: "I disagree with the defendants' position that all of this was so innocently done, or inadvertently done, I think it was done because of what it considered to be business necessities, and money took the forefront. . . . Allied knew it was polluting the waters."¹

Case 2. Daniel K. Ludwig, the wealthiest American, has been bulldozing much of 5,800 square miles of Amazon rain forest, replanting it for silviculture and agriculture, producing mostly rice, paper pulp, and newsprint. His Jari project is welcomed by many as a model for the whole Amazon basin. But this rain forest is the richest biological system on Earth, and how many thousands of plant and animal species Mr.

Ludwig and other Amazon developers are destroying cannot be known because the fauna and flora there are very incompletely studied. Hugh H. Iltis, a leading contemporary naturalist, has condemned Ludwig in a presidential address to the National Association of Biology Teachers for his part in "the enormity of this crime," among the biologically most dangerous and destructive events of this century.²

Case 3. Cyprus Mines Corporation, owned by Standard Oil of Indiana and Westinghouse, has proposed a uranium mine, the Hansen project, thirty-five miles northwest of Canon City, Colorado. Permitting agencies have been indecisive over disposal of the tailings, above grade or below grade, more or less expensive to handle depending on trenching involved and isolation from the ground water. Though the uranium is removed, daughter radionuclides remain, long-lived radium that steadily emits short-lived but mobile radon gas, decaying into further contaminants. By dust, wind, leaching, runoff, irrigation, wildlife movements, these make their way into air, water, food. Some studies find that revegetated soil cover would slow this, others find that plant uptake moves radon into the air faster than would a rip-rap cover. Radiation and health risks are debated. The project has stalled.³

The sorts of issues raised in these three cases will unfold as we proceed, but right at the start we begin to see how environmental questions have recently awakened us from our ecological slumbers. The Environmental Protection Agency and related regulatory agencies have become major federal powers. There are many state and local environmental rules. Environmental regulation is a daily fact of business life. But business leaders ought not to be concerned merely with obeying the law. They will want to be sensitive to the right and wrong that underlie, or should underlie, the law. Debates about new laws or less regulation will turn on what is just. But how can we decide right or wrong in such cases? That is the central question that demands our attention.

§2 TWO KINDS OF ENVIRONMENTAL ETHIC

Two kinds of environmental ethic are possible. The obvious kind is anthropocentric. Right and wrong are determined by human interest. This ethic (let us call it the humanistic ethic) is secondarily an environmental ethic; concern for the environment is entirely subsidiary to a concern for *humans*, who are helped or hurt by the condition of their surroundings. The other type (the naturalistic ethic), held perhaps more intensely by fewer advocates, is directly about *nature*. It holds that some natural objects, such as whooping cranes, are morally considerable in their own right, apart from human interests, or that some ecosystems, perhaps the Great Smokies, have intrinsic values, such as aesthetic beauty, from which we derive a duty to respect these landscapes. Both types have new moral applications to think through, but the naturalistic ethic is more radical. While few deny that humans have duties to other humans, many puzzle how non-human nature can be the object of duty. Nevertheless, a novel happening in current normative ethics is the emergence

of serious thought about the possibility of a non-anthropocentric, naturalistic environmental ethic. Is there moral awakening going on here, analogous to that of the days when we awoke to the evils of slavery or of child labor? People in business are by custom bound to consider the anthropocentric ethic, but not the naturalistic one. But those in the world of business eventually will encounter the principles and implications of the latter ethic and, as the proverb has it, there is no time like the present to begin to do some thinking here. This is not only because some of the most vigorous critics of business have these deeper concerns, but because even those who operate out of humanistic motives may find that they sometimes share sympathies with, and find some logic in, what the naturalists recommend,

We will begin with a sketch of some of the main principles or operating rules of a humanistic environmental ethic (§§3-12) and follow that with a sketch of some main rules in a more naturalistically oriented environmental ethic (§§13-22). In a third and final part (§§23-32), we note how the ethical interplay between business and the environment is an especially complex thing. Owing both to the nature of business in our industrial society and to the nature of environmental interactions, complications arise that require us to make ethical judgments in less familiar and more demanding contexts than ethicists sometimes face. Our final group of guidelines offers some advice for the businessperson in the midst of the complexities of environmental affairs. A mosaic of ideas—humanistic and naturalistic concerns, individual and corporate responsibility, obligations to future generations, shared risks, and so forth—has here to be kept in focus if we are to form a clear picture of "the facts" and "the values." Stand too close and we see some details but lose the over-all design. Stand too far away and we see the shape but lose the substance. The challenge is to command a clear view.

A further word is appropriate about the style of presentation. Our over-all argument does not run like the links of a chain, for extended formal argument is seldom possible in ethics. Rather, what unfolds is a series of maxims, or injunctions, together with explanations and illustrations sufficient for the reader to see what is demanded. This invites critical reflection. So far as readers find, on reflection, that these "commandments" make sense, they will tend cumulatively to support an over-all ethic, as multiple legs support a large table. These maxims will be what moralists sometimes call middle-level rules, that is, neither very general nor very specific. We will give each one a name, so that we do not forget it too easily.

II. *BUSINESS AND A HUMANISTIC ENVIRONMENTAL ETHIC*

Environmental ethics connects us with a problematic theme: how to harmonize the sometimes dissonant claims of private interests and public goods. An old ambivalence in the Judeo-Christian mind about profit-

making and how this mixes doing unto oneself with doing for others has reappeared in recent discussions about the social responsibility of business. If moral philosophers have nearly agreed to anything, they agree that ethical egoism (I ought *always do* what is in my enlightened self-interest) is both incoherent and immoral. If ethically enlightened executives have nearly agreed to anything, they agree that profit-making cannot be the *sole* business of business, however much it is a necessary one, and however unsettled the extent of their social responsibility. In a narrow sense, the personal ethic most opposed by ethicists seems to be the bottom line of all business. But in a broader sense, much business is possible that simultaneously serves private interests and public goods. It is hard for a large business to stay in operation, whatever its profits, unless the managers and employees bring themselves to believe that the firm is contributing to the public good. Else, negatively, they must regard themselves as trapped or bury themselves in their own anxiety. But, positively, this means they will try to choose a route that at once serves their profit and the public good, more or less. That much agreement, admittedly rough, reconciles business and moral philosophy enough to let us apply this in environmental ethics.

"Environmental and other social problems should get *at least* as much corporate attention as production, sales, and finance. The quality of life in its total meaning is, in the final reckoning, the only justification for any corporate activity."⁴ That demand, with its emphasis, comes from the former chairman of the board of the world's largest bank, Louis B. Lundborg. What would it mean to write environmental ethics into company policy? If that ethic is humanistic, the following ten maxims would be first considerations.

§3 THE STAKEHOLDER MAXIM: ASSESS COSTS SUFFERED BY PERSONS NOT PARTY TO YOUR BUSINESS TRANSACTIONS

Social costs do not show up on companies' or customers' books, but someone pays them sooner or later. Dumping pollutants into the air, water, and soil amounts to having free sewage. A business exports pollution, more or less of it depending on how much one can get past current regulations. The EPA classifies over half of the fifty thousand market chemicals as being hazardous if inadequately disposed of, with perhaps only ten percent being safely handled. Divide or multiply their figures by two or three, and the threat is still serious. Someone has to suffer impaired health, a blighted landscape, and reduced property values, and pay clean-up bills or medical costs. The acid rain falls downwind at home or abroad. Governor George Wallace once remarked, as the winds blew east to waft pollution through the Alabama capitol's corridors, that the odor wasn't so bad. In fact, it was "sweet" because it was "the smell of money."⁵ He could more accurately have said that it was the smell of money changing pockets from the hapless victims, who must pay for the damages, to those of the business operators who profited the more from their free sewage.

Here a good company will follow the urging of Henry B. Schacht, chairman of the board at Cummins Engine Company, to consider the stakeholders as well as the stockholders.⁶ But it is easy to forget this because of the concentrated benefits and widespread costs. The costs are heavy but too thinly dispersed to keep focused against the lesser but concentrated benefits. Lots of persons are hurt, but they may not be hurt very much, or be able to show very easily the origin of their hurt. Individuals may be too scattered to organize themselves well against the offending company. The stakeholder maxim enjoins concern about all this.

The Kepone fine (see Case 1) shows how legal penalties are developing because business has been notoriously slow to police its spillover. The Superfund legislation of 1980 provides large sums to clean up a hundred orphaned sites inherited from (knowingly or unknowingly) irresponsible practices of earlier years. Many chemical and petroleum companies backed this legislation, a bit grudgingly, perhaps hoping thereby to deal with the tip of an iceberg. They will get off cheaper this way than if the full extent of old costs hidden at fifty thousand sites ever becomes evident. One business by itself can only partially (to use an economist's catchword) internalize these externalities, but every business can as a matter of policy work in concert with others here. Almost every reader is carrying in his body some of the burden of this problem, so there ought to be none unwilling to weigh the moral burden here.

§4 THE COUNTRYSIDE MAXIM: DO NOT ASSUME THAT WHAT'S GOOD FOR THE COMPANY IS GOOD FOR THE COUNTRY

The aphorism of Charles E. Wilson, a famous GM executive, that, "What's good for General Motors is good for the country," is half true, even mostly true.⁷ But its untruth comes out well in environmental affairs, where we give the word "country" a grassroots twist to include the people in their urban and rural places. The United States automakers have steadily resisted stronger pollution standards and fuel-efficient cars, foot-dragging all the way. This is true even though the cleaner air was good for the city, the countryside, and all inhabitants thereof, and though smaller cars would have been less demanding on petroleum reserves. Their reason has been that compliance took extra work and put a crimp in the industry's profits. Every developer, realtor, purchaser of minerals and fibers, user of energy, and disposer of wastes will find some ways of doing business better, some worse for the countryside, and here one ought to love his country more than his company. Each business, like each person, lives, eats, and breathes in and on a public reservoir. In this sense there is no such thing as a private business. Garrett Hardin has described in a sad phrase, "the tragedy of the commons," how individuals and their companies can each do what is in their own immediate self-interest but all together gradually destroy the public domain, "the commons," including their neighborhood and countryside, its air, water, soil, forests, resources. They end by destroying themselves.⁸

§5 THE SUNSHINE MAXIM: DO NOT KEEP COMPANY SECRETS THAT MAY VITALLY AFFECT THOSE FROM WHOM THE SECRETS ARE KEPT

This permits a healthy outside environmental audit. A company has a limited right to keep trade secrets and to classify its affairs, but there is a lamentable tendency under this guise to conceal information that might prove detrimental to the company. The reluctance to count spillover costs or the trouble distinguishing the good of company and country make it important to get the facts, and lack of them, out for the purpose of open debate. This is especially important if those who may be hurt are to have the chance to defend their own interests. It took the Freedom of Information Act to disclose that (in 1976) eight thousand pounds of plutonium and bomb-grade uranium were unaccounted for in the United States, enough for the construction of hundreds of nuclear weapons. A corporate polluter once claimed that the amount of sulfuric acid his company dumped into the Savannah River was a trade secret; others have claimed that the public had no right to know what was coming out of their smokestacks. The National Science Foundation's Panel to Select Organic Compounds Hazardous to the Environment sent a survey to industries in 1975 and found that only twenty-eight percent of the industries gave replies that were usable as answers in compiling data, owing largely to the tradition of secrecy in the chemical industries.⁹ Subpoenaed documents have often shown companies to be telling less than the whole truth.

Love your "enemies" here because they are in the long run your friends, unless you really don't care whether you harm innocents. Company policy should volunteer relevant files cooperatively, even if this may reduce company profits. It forces you to more care, but the threat of potential harm to innocents overrides reduced profits by operators. The sunshine maxim also requires individual employees to reverse, even to violate, policy that maliciously, tacitly, naively, makes truth the first casualty in an environmental contest. It may require whistle-blowing. The secrets here are sometimes about secrets, For example, the administrators of a nuclear reactor may fail to reveal that they do not know the extent, and cannot diagnose the threat, of contaminants released in an accident. It is hard to maintain credibility when ignorance and mistakes are exposed, but still harder to recover it when once it is found that you have lied or mismanaged the news,

§8 THE LEGACY MAXIM: DO NOT DISCLAIM RESPONSIBILITY IN INHERITED PROBLEMS

Many mistakes were made before hazards were understood. When an individual joins a firm, he or she inherits all its problems (often coinciding with its opportunities) proportionately to his or her influence with that company, the degree of which may advance over time. When a firm enters the market, it inherits all its problems (also its opportunities) pro-

portionately to its share of the market. Both individuals and firms will find themselves with problems for which *they* are not responsible. *Other* actors produced the present situation. We have a rationalizing tendency to conclude that we are not responsible *in* the inherited mess if we are not responsible *for* it. The employee may not have been born or the company in business when the now-orphaned wastes were carelessly dumped. But present operators, both one company and all in concert, can do something about reversing these conditions, as the firms backing the Superfund illustrate. Creatively doing what we can is our responsibility. When we wake up to sufficient environmental deterioration to alarm us morally, the problem is well underway. It is not "our" fault, if we restrict the scope of "our" to present employees and firm, but it is still "our" problem. Voluntarily to join a company is voluntarily to assume responsibility for the effects of its past decisions.

§7 THE NO-DISCOUNT MAXIM: DO NOT DISCOUNT THE FUTURE ENVIRONMENTALLY

We now place a moral check on the practice, used wisely enough in limited places in classical economics, of discounting the future. Initially a function of the interest rate, discounting is philosophically defended because future needs are uncertain and resources shift with developing technologies. We excuse our present consumption by saying that what persons desire varies over generations, and that future persons will have to look out after themselves. Nor do we altogether use up natural resources; we partly convert them to capital, which others inherit.

Such justifications make some sense, but fail when we begin to tamper with what have hitherto been the natural certainties. Perhaps we are not obligated to supply future generations with oil or timber, for they may not need these as much as we do. But water, air, soil, genes, even landscapes are not in this class of resources, because they are more timeless and irretrievable. They define everything else, and there are no substitutes. There is a difference between cutting off a person's paycheck and cutting off his air supply, between eating the harvest and eating the seed corn. We have no duty to leave our grandchildren wealthy, but we ought to leave them a world no worse than we found it, like campers who use a campsite.

The issue is deceiving because we only gradually push the troubled skies and poisoned soils over onto the next generation. When the fifty-five-gallon drums storing our wastes rust out, their labels gone, what then? Toxins in ground water are nearly impossible to remove. If the Pharaohs had stored their plutonium wastes in the pyramids, these would still be ninety percent as lethal as when stored. Radiocontaminants from uranium tailings will be mutagenic for generations. Our books may be black, the GNP up, but how much of this is because of what we have charged to future generations? One shouldn't make debts for others to pay, and especially when there is no foreseeable way for them to pay such debts.

But concerns here are not merely those of safety and a decent environment. They are also about freedom to enjoy the natural amenities. What if the executive's grandchildren prefer warblers, eagles, parks, the seasonal rhythms of a countryside, over the aging shopping centers and hydroelectric plants he leaves them? They might complain that he bequeathed them no capital. They are more likely to complain that he took away their options in wildness, and that business and technology can provide no authentic substitute. Thou shalt not steal the natural basics from tomorrow.

§8 THE UNCONSUMPTION MAXIM: MAXIMIZE NON-CONSUMPTIVE GOODS

Consumption is what business and even life is all about, for we all consume to live. But in another sense consumption is a kind of wasting disease, one of ineffective use. Perhaps permitted levels of consumption can rise gradually over time, as broader resource bases, recycling methods, and energy techniques are discovered. Then the luxuries of the fathers can become the necessities of the children. Nevertheless, at any given decision point, it is better to favor the least consumptive alternative. Some things can be used without being used up, the difference between a cloth and a paper towel. A trophy hunter brings the buck back with him, a wildlife photographer leaves him there for others to enjoy. So, fiscal concerns being equal, an optics manufacturer might prefer telephoto lenses to crosshair scopes. Often, the less consumptive a good is (a day spent hiking the Appalachian Trail), the higher its quality. Amenity use tends to be non-consumptive, while commodity use tends to be consumptive. A realtor who resolves to keep goods as public and permanent as possible will not seek to convert into posted, exclusive cabin plots land suitable for a state park or essential to the Trailway.

One alarm clock may last two years, another twenty. In our lavish yet cheap, throwaway economy, business has hardly urged efficiency upon its customers. The market is full of planned obsolescence, with far more time spent hooking the gullible buyer into consumption than is spent considering alternative, possibly equally profitable; ways of making goods more durable. We too often have (adapting a computing term) a gigo economy, garbage in, garbage out, because the stuff is not only junk when finished, it is junk when sold. There are some goodies too that should hardly have been made at all. It is unlikely that electric carving knives have really benefited one in a hundred of their purchasers. The advice to eliminate consumptive goods is ridiculous, but the effort to maximize consumptive goods is equally so, and unethical as well.

§9 THE RECONSUMPTION MAXIM: MAXIMIZE RECYCLING

Make it so it will last, but then again, make it so it won't. When junked, can it be remanufactured? Of otherwise comparable materials, which one

may be more economically reused? General Motors has had a task force looking for ways to improve the recyclability of cars by changing the materials. Ecologically, one material may be biodegradable, another not. The hamburger must be eaten, but does it need to be wrapped in so majestic a petroplastic carton, used for twenty-five seconds to carry it from the counter to the table, then tossed to lie in a trash heap for decades? The hamburger is digested and eliminated, the nutrients recycled; the wrapper, indigestible by man or microbe, outlasts the life of the burger eater. For that matter, does the hamburger even need to be wrapped, if this requires Mr. Ludwig to sacrifice the Amazon rain forest? (See Case 2.) The soda pop consumed on the trail is soon gone, the aluminum tab tossed there lasts nearly a century. It might have been manufactured affixed to the can, and the can packed out and recycled by deposit or buy-back incentives. A single wood-handled carving knife will outlast half a dozen electric ones; it gives its user needed exercise and no expense. If it ever wears thin, the wood can rot and the steel be remelted, while the plastic from the electric gadgetry lies useless at the dump.

An economist needs to be mindful of what an ecologist calls "throughput" in the system, the movement of energy and materials so that the valuable constituents nowhere choke up, but keep being reutilized in the systemic flows. From one viewpoint this is a matter of expediency and efficiency, but from another it is also a moral concern. How do we spend a resource so as to keep it from being spent forever? How do we recycle value? Nature's bounty and invisible hand once took care of these things reasonably well, but no longer. So business has a new duty.

§10 THE PRIORITY MAXIM: THE MORE VITAL AN IRREPLACEABLE RESOURCE, THE MORE WORTHWHILE THE USE TO WHICH IT SHOULD BE PUT

No resources should go through the economy too cheap to meter, but some are dear enough to need metering by more than market supply and demand. Of those non-renewable and difficult to recycle, some are more crucial than others. The more one does business in this type of resource, the less one ought to manufacture transient, trivial goods, the more one ought to lock it into the capital of the economy. Molybdenum is in relatively short supply, its ores are uncommon. An area known as "Oh Be Joyful" near Crested Butte in Colorado high mountain country, desirable for wilderness, for watershed, for ski development, is believed to have high potential for ore. The large Mount Emmons mine is already being planned nearby. Retained as wilderness, the area would be used non-consumptively, or it could be developed for skiing and lightly used with high public turnover. If prospected and later mined, as urged by AMAX, the area has to be destroyed, with drastic social effects as well on the small town.

Now what becomes of the molybdenum? It goes into solar collectors, which help toward energy independence. It goes into ICBMs, but do we have enough already? It goes into sporting rifles, so trophy hunters can shoot up their game, and into electric carving knives, of which we have too many already. As wilderness, the area is in short supply; but the molybdenum is needed, so it might be sacrificed for true but not for false progress. Solar development, though destroying the wilderness, might be more important than skiing, which doesn't. But if the wilderness is to be destroyed, then the vital mineral should not be indifferently used. Unfortunately in our present capitalist economy (as socialists rightly lament), there is no one to ration the use of such a resource. Until this comes, perhaps by selective taxation, the business community needs to develop some conscience about priority uses for our more critical resources. That is admittedly a difficult assignment, and many will shrug their shoulders and say they can do nothing about the demand for and uses of their products. But that is only to acquiesce in an unjust and clumsy market system.

§11 THE TQXIN-IS-TRUMPS MAXIM; AN OUNCE OF PERMANENT TOXICITY IS WORSE THAN A TON OF PASSING GOODS

The Business Roundtable lobby has complained that federal authorities are overly biased in favor of health protection.¹⁰ There is room to discuss what counts as acceptable risk, especially since minute pollutants are the most expensive to remove, but surely one wants a moral bias in favor of health, over the production of extra goods, public or private. Given the recalcitrant sloth of leaky businesses, one wants lots of such bias. They have preferred to pollute until damage was evident, and impossible or expensive to reverse. They have scoffed at risks, later to eat crow while the public eats their contaminants. Especially in view of time lags here, the margin of error ought to favor those who breathe, not those who pollute. Even in small amounts, such long-term toxicity is foisted unwillingly upon millions not party to the business. The aerial spraying of pesticides, which involves nearly two-thirds of their use, mostly on fiber crops, not food, increases the risk of disease of those downwind, who may derive little or no benefit from the spraying, and take the risks involuntarily. This can happen while short-term goods are sought willingly by the customers, and profits by the operators. If you can't survive without polluting at toxic levels, then you should go out of business; society cannot afford your kind of business, Life shortened and life crippled is life taken; and thou shalt not kill.

The Kepone in the James River will gradually flush out, but toxicity levels are unknown, and when eventually ingested the carcinogen has a latency period up to twenty-five years. (See Case 1.) Here, the more permanent the toxin, the more it counters large amounts of immediate goods. The radioiodine in my thyroid kills me and moves on to others afterwards. Plutonium remains lethal for fifty times longer than any civili-

zation has yet survived, five times longer than *Homo sapiens* has survival. Even the brightest engineer must have a dull conscience to say, with Mr. Micawber, "Oh, well, something will turn up to detoxify it. My decade needs the extra energy." So he builds his nuclear plants, risks the plutonium use, and ships his noxious freight down the road out of sight. In view of accidents, terrorism, and even "permissible" exposures, are not the chances better that someone will get hurt by it? Over the long haul, some violations in environmental ethics are more dangerous than those in traditional ethics, because of the threat to so many generations. Since a toxin erodes life and health, a little overrides a lot of the pursuit of happiness. In repeated surveys the public prefers environmental protection over lower prices with pollution by about two to one, and a majority in all walks of life will say that environmental integrity at critical points must be maintained regardless of cost.

§12 THE STEADY-STATE MAXIM: ACCEPT NO-GROWTH SECTORS OF THE ECONOMY

Some sorts of growth may occur forever, as advancing technology makes new products possible. Our supply of materials is finite (short of space mining); but materials can be recycled and substituted and energy in principle is in generous supply, although in practice difficult to get cheaply. The growth of know-how may be unlimited, given the ingenuity of hand and brain. At the same time, some sorts of growth have limits, and here the ethical economist mixes savvy with conscience to know what growth to stimulate and what to subdue, before limits are thrust upon him. There are sixty-nine dams on the Tennessee and Cumberland river systems, and perhaps there should be no more. The chamber of commerce might better be of a Lesser, not a Greater Seattle. Perhaps there should not be a greater per capita consumption of electricity, not until we can manage this without those toxins. Perhaps there never need be three televisions in every home. Our United States cars should never have been the two-ton, tail-finned dinosaurs they were in the sixties. Think steady, when enough is enough. Think small, when less is more. A sign of the adult state, surpassing juvenile years, is that physical growth is over, and a more sophisticated intellectual and social growth continues. In these years physical growth may be nonfunctional, even cancerous.

III. *BUSINESS AND A NATURALISTIC ENVIRONMENTAL ETHIC*

A humanistic ethic may be viewed as a matter of fouling or feathering our own nest. It has insisted on considering a public, not merely a company nest. But ethical concern deepens with the claim that we have comprehensive duties to consider the natural community and its diverse sorts of inhabitants. In this community we humans no doubt have our

interests, but these interests are, as it were, investments in a bigger corporation. Here we humans are major but not exclusive stockholders. The place of lesser subsidiaries has to be recognized. In a humanistic ethic, we had only to pull environmental concerns under social values already more or less in place. But with a non-anthropocentric, naturalistic ethic we have to pull social values under an inclusive environmental fitness. When human interests are the sole measure of right and wrong, nature is but the stage upon which the human drama is played. When non-anthropocentrism comes to the fore, the plot thickens to include natural history. The humanistic ethic will still be needed, but if exclusive, it will be pronounced shallow. Any business is wrong that asserts self-interest at cost to the whole public welfare. We have already conceded that. Now we move the argument one step up. The whole human business is wrong if, likewise, it asserts its corporate self-interest at the expense of the bio-systemic whole, disregarding the other stakeholders. We need some enriched moral calculus reconciling human and natural systems, economic and ecological ones.

What values would a naturalistic environmental ethic recognize and seek to foster? That is what the next list of maxims attempts to identify. These value judgments will affirm the worth of objective characteristics in nature (for example: life, rarity, complexity) and deny that nature is in the usual economic sense a collection of resources. But adding to our moral puzzlement, we will find that nearly all these maxims have a humanistic rider. Some benefits may come to humans who recognize the natural excellences. This fits the age-old observation that to respect the integrity of another person is often to gain a benefit from this. Nevertheless the benefit is often nebulous and iffy, softer and more intangible, never very impressive before hard, immediate economic pressures. Humanistic motives are here weak and subordinate. They must combine with some appreciation of nature to bring you to endorse a maxim. This leaves us confused about our motives and principles, but it may nevertheless leave us with operational guidelines so that when in business we can do business with ecological satisfaction.

§13 THE REVERSIBILITY MAXIM: AVOID IRREVERSIBLE CHANGE

We do our business in a many-splendored natural system, one where life has so far prospered. It vastly exceeds our mastery, is incompletely understood still, and its mysterious origins and dynamics are perhaps finally unfathomable. All evolution is irreversible but moves very slowly. Here humans want to avoid precipitous irreversible changes, or even minor ones we later regret. This commandment mixes respect and fear. This natural system, though sometimes hostile, is one in which we have been generated and now flourish. We should respect it as our home soil and be reluctant to do anything that might make it worse for ourselves, worse because we have tinkered with what is already a pretty good Earth.

All business alters nature, and any experimental venture runs some risks. But we should not disturb an ecosystem so that we cannot, if we later wish, put it back as it was. "To keep every cog and wheel is the first precaution of intelligent tinkering," warned Aldo Leopold, a forester and one of the first environmentalists, writing a generation back.¹¹ We should leave room to reconsider; we should avoid radically closing options. Choose that business which allows us to redeem our mistakes. Any change is to some extent irreversible, but recent technology has made some quite irreversible—the extinction of species, the loss of critical habitat, the shrinking of breeding populations, the introduction of exotic pests, toxins and mutagens in soil and waters. The chestnut and the passenger pigeon are gone forever, the starling and the English sparrow are here to stay. What next with our effluents in the salt marshes, with our acid rain over the Adirondacks, with our bulldozers in the Amazon? What links are being cut, what gene pools overshrunk, what eggshells are becoming too thin?

§14 THE DIVERSITY MAXIM: MAXIMIZE NATURAL KINDS

Nature creates lots of niches and then puts evolutionary and genetic tendencies to work filling these with a kaleidoscopic array, as glancing through a butterfly guide will show. It would be a pity needlessly to sacrifice much, if any, of this pageant, especially if we get in return only more good like that of which we already have enough. Variety is a spice in life. That says something about human tastes, but not so as to overlook the natural spices. There are twenty-two recreational lakes on which to water-ski within sixty miles of the Tellico Reservoir. There was but one rare, small snail darter population before it was drowned by the dam and scattered by hectic attempts to transplant it. The darter had no use, but it could have made the place interesting. This is not an axiom to maximize kinds unnaturally, but only to preserve diversity where we find it naturally, so far as we can, and unless we can find overriding reasons why not.

Often more is at stake than tonic and interest. Natural ecosystems are resiliency interwoven, usually so that when one thread breaks the whole fabric does not unravel. They absorb interruptions well, as when the chestnut was replaced by oaks. But with the advent of monocultures (single crops grown over wide areas), we push the whole surrounding rural system toward a fragile simplicity. Factory forests, growing timber species only, and artificially revegetated mine lands are easy to operate, bring high yields, and lower costs. But they have low stability and high vulnerability to insect pests, diseases, droughts, and erosion. Even when diversity adds no evident strength, some of the natural kinds may have uses of which we are unaware. The remarkable medicinal properties of curare were found in 1940, but there are further stories of Amazon basin plants that dissolve gall and kidney stones, heal burns,

staunch bleeding, and provide long-lasting contraception. Some of these plants are common, others endangered, and Mr. Ludwig ought not to destroy the Amazon forest before we know whether those stories are true. (See Case 2.)

At least one can maximize diversity in quality, with all sorts of habitats located so that many persons have access to them. Nothing here depreciates business-built environments. We only insist that some wild ones be kept too. We have no business impoverishing the system. Yet industrial expansion has accelerated the natural extinction rate a thousand times, and we have only a fraction of the wilderness we had a century ago, when our population was a fraction of what it is now.

§15 THE NATURAL SELECTION MAXIM: RESPECT AN ECOSYSTEM AS A PROVEN, EFFICIENT ECONOMY

Business and labor use resources resourcefully, and this effort spent transforming nature sometimes leads us, unreflectively, to see raw nature apart from human occupation as a useless wasteland. But an ecosystem is an economy in which the many components have been naturally selected for their efficient fitness in the system. There is little waste of materials and energy. Wherever there is available free energy and biomass, a life form typically evolves to fill that niche and exploit those resources. The economies we invade are durable, they have worked about as they do for tens, even hundreds of thousand of years, and in this sense each is a classic. Nature is a sort of tinkerer, adapting this onto that, seldom starting from scratch, but by trial and error experimenting with odds and ends on hand, pragmatically insisting that a thing keep working, surviving, or tearing it up and making something else. There is relentless pruning back by a sort of cost-efficient editing process, so that only the fittest survive. Detroit engineers do a lot of this sort of tinkering, pressed toward efficiency, defeated if their trials are structurally or functionally unsound. Even business in general operates much like this.

When we step in, we need to be careful with our massive, irreversible, simplifying innovations, because the chances are that our disturbance will have some unintended bad consequences. Even Ph.D.'s in engineering can be like the foolish natives who slash and burn, and wonder why the desert advances and their economies fail. With their forests gone, the Brazilians may soon be asking why their lateritic soils have lost their fertility. (See Case 2.) One analyst even warns, "The survival of man may depend on what can be learned from the study of extensive natural ecosystems,"¹² That is perhaps extreme, but it is likely that our economy can be improved by attention to the efficiency of nature's economy. Again, appreciation of what nature objectively is has a spin-off. Those who prefer to say that the effect on human welfare is all that is valuable here may nevertheless endorse this maxim, only giving a more pragmatic twist to the word "respect." Even in modern business we can

ponder an aphorism coined long ago at the start of the technological age by the English philosopher Francis Bacon, "Nature is not to be commanded, except by being obeyed."¹³

§16 THE SCARCITY MAXIM: THE RARER AN ENVIRONMENT,
THE LIGHTER IT OUGHT TO BE TREATED

Nature's habitats are unevenly distributed. Grasslands are common, gorges infrequent, geothermal basins rare. Human development has increased the rarity of them all; we have only scraps of once-common ones. The Little Tennessee, now feeding a lake at the Tellico Dam, was one of the last really wild rivers in the East. The rarer an environment, the more carefully we ought to do business there. This will impose minimally on business in general, though it will vitally affect the few companies who work in rare environments. Weyerhaeuser, "The Tree Growing Company," with a generally positive environmental record, owns timberland areas collectively as large as Massachusetts. A few holdings are subalpine forests interfingering with alpine meadows; others are cathedral groves of virgin growth. The former were always relatively rare, the later are now. Weyerhaeuser has been clear-cutting both, and their director of environmental affairs, Jack Larsen, maintains that, while there is a public interest in preserving such forests, this is not the responsibility of a private land owner." but "a function of government."¹⁴ But this is too simple a shifting of responsibility. Proportionately as these forests are rare, they ought to be cut by selection or remain uncut, whether or not the government is alert about this. The managed, regrown forests that may slowly succeed the primeval ones will not be the equal either for wilderness experience or for scientific study of the rare, virgin forests sacrificed for a quick crop.

The rare environments are not likely to be essential to regional ecosystems, and hence we can do without them. But they may serve like relics, fossils, and keepsakes as clues to the past or to alien and twilight worlds. They are planetary heirlooms that hark back to the wonders of nature, to our broader lineage. Their serendipitous benefit is that, as environments under special stress, they are often good indicators of the first negative effects that humans introduce, good laboratories of exotic survival. Given our bent for radical technologies, it is hard to predict just where the next stress points will appear, and what will be the best laboratories in which to study them.

§17 THE AESTHETIC MAXIM: THE MORE BEAUTIFUL AN
ENVIRONMENT, THE LIGHTER IT OUGHT TO BE TREATED

Every businessperson has stood at some scenic point and been glad for the pristine, unspoiled beauty, Teddy Roosevelt exclaimed before the Grand Canyon, "Leave it as it is. You cannot improve on it. The ages have been at work on it, and man can only mar it"¹⁵ The really excep-

tional natural environments do not need any business development at all. Tastes in beauty differ, but a survey of what most people think will usually do for business decisions. In tougher cases, the witness of experts with enriched aesthetic sensitivities can be sought. Some art is priceless, and all art is awkward to price. Here natural art is not really an economic resource, but is better understood in romance. The technological, businesslike relation of humans to nature is not the only one; and sometimes we wish not to show what we can do, but to be let in on nature's show. Where natural places are not left alone, we ought to work in and on them in deference to their beauty. The philosopher Alfred North Whitehead lamented a half-century ago, "The marvellous beauty of the estuary of the Thames, as it curves through the city, is wantonly defaced by the Charing Cross railway bridge, constructed apart from any reference to aesthetic values." Society suffered the loss of natural beauty here because "in the most advanced industrial countries, art was treated as a frivolity," and "the assumption of the bare valuelessness of mere matter led to a lack of reverence in the treatment of natural or artistic beauty." In any socially progressive business, "the intrinsic worth of the environment . . . must be allowed its weight in any consideration of final ends."¹⁶

§18 THE CHINA SHOP MAXIM: THE MORE FRAGILE AN ENVIRONMENT, THE LIGHTER IT OUGHT TO BE TREATED

Natural ecosystems have considerable stamina, but not equally so. Industrial society developed in Europe and the eastern United States where (and in part because) the soils were fertile, the climate temperate, the waters abundant. This sort of ecosystem is especially self-healing and those environments took a lot of punishment and offal. Society moved into the arid West; industrial expansion went multinational., seeking raw materials even under the tundra and sea. We have discovered, often sadly, that old ways of doing business will not transplant to fragile soils. The Alaska pipeline crosses eight hundred miles of arctic vegetation. Some gashes will be there long after the oil is burned, even after the men who made them are dead. The oil shale found in the plateaus of western Colorado is proving difficult to extract without mutilating the terrain. The shale has to be heated, and if this is done above ground the spent shale is hard to revegetate, given the low precipitation and chemical changes in the retorting. If it is done underground, the toxins may contaminate the limited water in the aquifers that feed the few creeks and watering holes. Technologies that might work with thirty inches of rain cannot be used with an eight-inch rainfall.

All this is, in the first instance, the prudent preventing of a boom and bust cycle. But it can be a reluctance to go bulldozing in a china shop, lest what is busted be "ruined," perhaps because of its beauty or rarity, perhaps to avoid irreversible change, or to maintain diversity, or to appreciate the extra regimen in an economic system so soon subject to our

distressing it. Fragility alone, like rarity, is hardly a value word, But it has a way of figuring in a constellation of natural qualities; and in the whole pattern we may find some respect for the integrity of a natural place. We may resolve to do our civil business with less insult, less savagery. Vandalism is possible on nature, even in a businesslike way.

§19 THE CNS MAXIM; RESPECT LIFE, THE MORE SO THE MORE SENTIENT

The capacity for quality of experienced life parallels the sophistication of the central nervous system (CNS). Pleasure and pain become more intense as we go up the phylogenetic tree. It has seemed self-evident to moral philosophers that pleasure by itself must be a good thing and pain by itself must be bad. But if evil for persons, then why not for sentient animals? It will not do to say: "Because they are not persons." That indeed is inhumane anthropocentric insensitivity! As Jeremy Bentham, an eighteenth-century English philosopher, accurately saw, "The question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?"¹⁷ Important differences need to be marked out between domestic and wild animals; the former would not even exist without human care; the latter sometimes suffer terribly in their natural ecosystems. Those who build an environmental ethic on animal rights and those who build it on the characteristics of natural ecosystems do not always agree. But we need not consider such problems here in order to conclude that one ought not needlessly increase suffering. Does not the Golden Rule reach at least this far?

Animal suffering might sometimes be justified by sufficient human benefits. Even then, we ought to do business so as to cause the least pain. We should, for instance, choose the least sentient animal that will do for the purposes of our testing and research. Some human goods may not justify the suffering they require. A pharmaceutical firm, Merck Sharp and Dohme, applied for a permit to import chimpanzees as the only known animal in which a vaccine for Hepatitis B can be tested, But chimps are a threatened species and known to be highly intelligent social animals. The capture of a juvenile chimp requires shooting the mother, and caged chimps are much deprived of their natural life. One analyst concluded, "The world has a growing population of 4 billion people and a dwindling population of some 50,000 chimpanzees. Since the vaccine seems unusually innocuous, and since the disease is only rarely fatal, it would perhaps be more just if the larger population could find some way of solving its problem that was not to the detriment of the smaller."¹⁸ The permit was denied, largely for ethical reasons.

Calves are confined in constricted stalls and, except for two daily feedings, kept in darkness for their entire lives, in order to satisfy a gourmet preference for pale veal, neither more tasty nor nutritious than darker veal. In the Draize test, cosmetics are tested by dripping concentrates into the eyes of unanesthetized rabbits until their eyes are swollen or blinded. The gourmet, the restaurateur, and the perfumed lady who

know these things might be less callous. Faced with growing public criticism, Revlon, Inc., has funded a \$750,000 grant to find a substitute for the Draize test. Ducks feed on spent shot that falls into their ponds, needing grit for their gizzards, and afterwards die slowly from lead poisoning. The manufacturer, the sporting goods retailer who knows this should prefer steel shot instead.

§20 THE LIFE-SPECIFIC MAXIM: RESPECT LIFE, THE SPECIES MORE THAN THE INDIVIDUAL

Three-quarters of adult Americans (the customers and stockholders of business) believe that endangered species must be protected even at the expense of commercial activity. That alone makes it good public relations to do business protecting rare and endangered species. We have already met some of their reasons: Extinction is irreversible, we lose diversity, beauty, a genetic resource, a natural wonder, a souvenir of the past. But more underlies these, really a religious reason. Life is a sacred thing, and we ought not be careless about it. This applies not only to experienced life, but to preservation of the lesser zoological and the botanical species. Species enter and exit the natural theater, but only over geologic time and selected to fit evolving habitats, Individuals have their intrinsic worth, but particular individuals come and go, while that wave of life in which they participate overleaps the single lifespan millions of times. Nature treats individuals with brief lives, but prolongs the type until it is no longer fit. Long-lived survival trends are at work here. Lost individuals can be replaced, but the species is irreplaceable, and the loss of critical habitat and a shrinking breeding population dooms a species.

Between one and three species vanish every day, and within a decade that could be one per hour. If the accelerated extinction rate is unabated, twenty percent of all species on earth could be lost within twenty years. About half these losses result from tropical deforestation, in which Mr. Ludwig is so vigorously taking part (see Case 2), and the second greatest cause is pollution. Such a threat cuts to the quick in our respect for life. The question now is not, Are they sentient? but, Are they rare? "We had to decide which was more important: saving a rare bird, or pumping more oil and gas from an area which is that creature's only known nesting place in North America. I decided in favor of the bird."¹⁹ So reported Walter Hickel, secretary of the interior, in a 1970 decision for the California condor. "For the birds!" The oil tycoon will say that derisively. "For the birds indeed!" The naturalist will say it too, but more respectfully.

§21 THE NATURE, INC., MAXIM: THINK OF NATURE AS A COMMUNITY FIRST, A COMMODITY SECOND

That ecosystems are intricate communities is an established biological fact, a principle of ecology, which those doing business in nature often

run into, sometimes to their regret. In the Pacific Northwest, loggers have clear-cut forests to discover, on some sites, that the forest cannot be regenerated. They did not understand the undercover shielding needed for seedling regrowth, provided by the cooperation of multiple species, sometimes weedy ones, or they did not understand the nitrogen economy, failing to recognize that seemingly useless lichens, found primarily on old growth trees, were critical fixers of nitrogen, which fertilized the forest. In Southeastern pine forests mycorrhizal root fungi are similarly crucial. The picture we get is of a community where parts fit together in what is called symbiosis.

Nature operates its economies in a cooperative mode, if also in a competitive mode. This does not mean that the individual members of the community are even aware of this process, much less endorse it, only that natural systems are selected to form a kind of togetherness. The strivings of the parts are overridden to insure cooperative behavior and functioning in a symbiotic whole. After Darwin, some might have said that nature is a jungle, a free-for-all where issues are settled by pulling and hauling. But after ecology, we get a revised picture of checks and balances that pull the conflicts into an interdependent community. This continues but goes beyond seeing natural systems as tight and proven economies, a fact that we recognized in an earlier maxim (§15). We think now of a community, a web of life, of life forms as flourishing only when interlocked in biological pyramids. In terms of the root metaphor of the word "ecology," a root shared also by "economics," we all live in a *household* (Greek: *oikos*).

Does any ethic follow from all this? Those who accept the prevailing, anthropocentric ethic will still treat things like property and resources, only they may become more prudent in extracting resources or eliminating wastes. But there are others, more naturalistically inclined, who can endorse the natural principle of life-in-community not only as a given but as a good. This account runs as follows. Even in humanistic ethics it is always individuality-in-community upon which ethics rests. There can be overly atomistic views that posit only self-interested individuals looking out for themselves, and some may think that business should be like popular conceptions of Darwinian nature, a field of competition where the fittest survive. But surely a more appealing view is one that can generate some sense of the individual welfare as inseparable from the good of the community, recognizing on a moral level in human affairs what we called symbiosis in biology. We have a doubtful ethic where an individual treats all fellow persons like so many commodities, forgetting how his life is in a community.

But when we turn to natural systems, we find the same sort of thing. The competitions take place in a cooperating community, not a moral or conscious one, but a good one, and when we humans come to do our business there, the principle of community membership, known already in human affairs, is to be continued because it fits well with the biological patterns we find; that life is always life-in-community. This may not

derive ethics from natural facts, but it at least tries to fit an ethic to natural modes of operation. In nature there are movements of self-interest that are quite properly present, but these are superintended non-deliberately in ecological systems by nature's overriding hand in favor of an interdependent whole. When humans, as moral beings, enter to evaluate this, they continue by endorsing the principle of interdependent life. We have the right to treat nature as a resource, but also the responsibility to respect the community in which all life is sustained. A business needs prudently to recognize the limits imposed by ecological laws. But it is even better for it to be fitted by moral temper for its place in the whole natural community of which it is a part. Nature is really the ultimate corporation, a cooperation, into which we ecologically must and morally ought to fit.

§22 THE PARENTAL EARTH MAXIM; LOVE YOUR NEIGHBORHOOD AS YOU DO YOURSELF

The surrounding countryside is, as Augustine said of God, that in which we live, move, and have our being. We should not be either irreverent or provincial about this. The local neighborhood is our nearest responsibility; there a business's impact for good or ill is likeliest to be felt. But the successes of big business and the revelations of science have shrunk the world so that our neighborhoods are larger and interlocked. The ultimate neighborhood is the parental Earth, seen so hauntingly in pictures from space. This Earth has generated us and continues to be our life support. It should be the object not only of our prudent care but of our love. This maxim is rather philosophical and general, but there are immediate, practical applications. We give local care to natural items that have become cultural symbols of home (the Shenandoah, the Mississippi, the bald eagle) but also to landforms just because they are the home in which life is set, to life forms just because they are our "neighbors"—in the Biblical sense. For the average American, already well-heeled and comfortable, from here on these natural things are increasingly worth saving, and if a business continues to destroy them, what benefits it provides are not likely to outweigh the harm it does. Even for the average world citizen, who has real physical needs that business ought to meet, the quality of life cannot really be raised if the quality of the environment declines thereby. Sooner or later, ethics and business must attend to the appropriate unit of survival, and that cannot be less than the whole Earth, the womb of all.

IV. ETHICAL COMPLEXITIES IN BUSINESS AND ENVIRONMENTAL CONCERNS

Moral responsibility in environmental affairs is as complex and novel as any responsibility a business executive is likely to face. This demands decisions that weigh technical, fiscal, social, and moral judgments, often

made over long hauls and in the face of unknowns, breaking new ground with an amalgam of humanistic and naturalistic interests. We face two kinds of ethical difficulties. One is where we know what ought to be done but not how to get the company to do it. The other is where we do not know what is right. We do not know the facts, or how to weigh the facts, especially statistical ones. We do not know how to attach values to facts, or how to trade this good off against that one. Decisions will not be ideologically pure, but rather messy (see Case 3). But there is some good news with the bad. The business executive will never be replaced by a computer on which these decisions are programmed. There will be an increasing need for business heads that can do hard thinking.

Someone may object that the maxims given so far are useless, because too general and imprecise. It is well to recall that ethics is not geometry, and that we should not expect of one what we require of the other. Remember that a principle or warning can have value even though somewhat general. Though we cannot derive from these maxims concrete solutions for every case, nevertheless they provide a background against which we can explore and assess our practical decisions. These who share some or even most of them may disagree in practice in some cases, but still they have reference points against which to work, a background against which to sketch the shape of their differences. These maxims have to be brought into cross-play between themselves and more traditional injunctions. One rule may collide with or sideswipe another. These are not maxims from which we can compute exact solutions, but neither are they empty. They lay moral constraints on available options. For actual decisions, we have further moral work to do. But these *prima facie* directives clearly preclude some wrong choices. We cannot eliminate but we can reduce ambiguity by maxims such as these.

Notice that whether an act is *expedient* or *moral* needs to be specified with reference to the actor, the affected class, and the time span. All these are complicated in business morality. Here individuals, who are morally responsible, act for the company, which is owned by themselves, by employers, by stockholders. The company itself has some explicit or tacit policy, and serves the community over both short and long terms, a community populated with changing individuals. A particular decision may be immoral but expedient for stockholders this year, its reverse, a decision that is moral though inexpedient now, may prove expedient five years hence, given ensuing public opinion and governmental regulation. Meanwhile the body of stockholders has somewhat changed, and different persons fill some company jobs, "offices." As a rule of thumb, the farther one looks ahead, the broader the group considered within the company, and the more effective social critics are, the more the moral and the prudent will coincide. As a rule, too, the bigger and more long-lived the corporation, the more fuzzy the line between private and public concerns, which increasingly interlock. Thus it tends to become true for such businesses that what is ethical is self-serving, but not in the way that ethical egoists maintain, but because smaller,

shorter-range individual concerns fade into bigger, longer-range corporate and social ones. Meanwhile also, no businesses and no persons within them escape immediate short-range pressures that sometimes pull them toward making short-sighted decisions.

Where moral decisions become complex, they often cease to be absolutely and unambiguously right or wrong, and we seek to judge what is the best of competing but mutually incompatible goods or to choose the least of evils. There is some good to be accomplished on either alternative, some profit, which too is a good, but some products delivered and services rendered which fill public needs. We need the power, the pesticide, the plastic, the paper pulp, but then again can we really afford it at this social cost and consequence? Someone is going to get hurt on either alternative. Here it is tempting to deliver the goods, give persons what they want, or seem to want, and let *them* assume the responsibility. But here, even more than in traditional ethics, the good is the enemy of the best. One has to watch for and compensate for what is called "the dwarfing of the soft values."²⁰ that is, where values that are quite important, even of the highest kind, but dispersed and soft, get trampled down before values that are not really any more important, but concentrated and hard, easy to get into calculations and marketable. We have to trade off clear scenic vistas against smoggy ones with cheaper power. Sometimes too persons' actions can be well-intended and still, when their actions combine with others, do ill environmentally. Nevertheless, at other times a great deal of environmental carelessness and even crime stems from rationalizing selfishness. Neither a humanistic nor a naturalistic ethic allows the abdication of individual and corporate responsibility, and the following maxims will help one to maintain a sense of responsibility despite the complexities of environmental concerns, in which it is easy (and sometimes convenient) to get lost.

§23 THE BUCK-STOPPING MAXIM: DO NOT USE COMPLEXITY TO DODGE RESPONSIBILITY

Environmental causal links are multiple, incremental, and long term. Their discovery is slow. Any verification is more or less partial, probabilistic, and backtracking. One can steadily deny that the sulfur dioxide from his smokestack had anything to do with the acidity of a pond two hundred miles away. One can point to closer plumes that sometimes blow that way, cite better-buffered watersheds where the fish still flourish, notice that volcanoes emit some SO₂, and for perhaps a decade debunk the evidence. As one is forced toward compliance, lag times for design, delivery, and installation of anti-pollution technology are easy to use for delays and confusions. With compliance mandated, one can build the stacks higher, if this is cheaper than scrubbers, airmail the contaminants further downwind past the local monitors, and claim that this dilutes them to a now-harmless level. Then the dispute has to start over whether this is so.

Add to this the complexity of the corporation, its business links, and its role in society. Various levels of management can deny authority, since this is often partial, and management can claim to be only agents, not principals, to work for stockholders, whose will seems to be known (to optimize profits by recalcitrant compliance) but who are too diffuse a body upon which to fix responsibility. Compliance will require financing, but will the lending agencies attend to the soundness of the projects they finance? Most banks resist the claim that they have any environmental responsibility; these matters are too complex for them to get involved in. The John Hancock Life Insurance Company, the Equitable Life Assurance Society, and Aetna Life and Casualty have, however, paid considerable attention to the environmental impact of projects they have financed, and sometimes voted the stock of companies in which they have holdings with this in view. Of course causal links and corporate responsibilities need to be clearly defined, for there is no single cause or villain, but the complexity ought not be a hiding place used to postpone responsibility or to subvert the law.

§24 THE NO-COSMETICS MAXIM: DO NOT USE PR TO CONFUSE YOURSELF OR OTHERS

Every company lives and dies not only in the market but also by its image. Here it is tempting to opt for symbolic solutions rather than substantive ones, then to advertise this legitimate but minor cleverness, while ignoring—deliberately or tacitly—the major environmental problems that lie still unsolved. The company builds a model new plant, while continuing to run thirty in non-compliance. It can exaggerate the cost of sound solutions, plead foreign competition, the unlikelihood of better technical solutions, feature the jobs lost in a plant closure, its solicitousness for employees, low profits in that subsidiary, and through it all so advertise the good will of the firm as to look better than it actually is, if management were to be honest with themselves. Diversionary PR only fools others about your worthiness; perhaps it even fools you. The ethical person insists on judging the reality behind the image, and, more than that, judges phony image-seeking to be unethical.

Diversionary PR is not only directed outside the company. The deep need of employees to believe that they are contributing to the public good can be a virtue. But it can also be a vice, because, owing to their need to believe this, employees are easily deceived by company pep talks about its environmental awareness, about its progressiveness before obstructionist Luddites, elitist birdwatchers, and canoe freaks. Here the need for personal self-justification coincides with the company's need for a positive image. This gives employees a tendency to rationalize and adds further to the company tendency to contrive token solutions and cover things up with rhetoric. But all this only confounds the problem. At the core of management, those in charge know the intricacies, possibilities, and costs of environmentally sound business better than the

agencies who are regulating them, or the environmentalists who are suing them, and if they don't then they *ought* to—an *ought* with elements of both job competence and morality. A nuclear power consortium should focus on these things, rather than publish a promotional pamphlet that exclaims that God must love nuclear reactors because in the stars he made so many of them,²¹ which only diverts attention from whether we ought to build this reactor three miles, not ninety-three million miles, from an elementary school.

§25 THE SECOND MILE MAXIM: MORALITY OFTEN EXCEEDS LEGALITY

"There's no law on the books that says we can't." But environmental novelties are still unfolding, they ignore jurisdictions, and one can expect here a lag time between legislation and the developing conscience. Nor will the law at its best ever embody more than the minimum negative public ethic. It forbids the most serious violations, but it cannot command the second mile of good citizenship. Even the conservative Milton Friedman, doubtful of any social responsibility for business, recommends that business "make as much money as possible while conforming to the basic rules of the society, both those embodied in law and those embodied in ethical custom."²² That recognizes the gap between the legal and the moral, but is too conservative, because in environmental ethics what is already embodied in ethical custom, beyond the law, is likely to be archaic. Unprecedented sorts of damages may be done before the law and public opinion wake up, but the managers of an offending business may be able to sense and correct trouble much sooner. In this ethic, a business leader is called to live on the frontier. The best will be ahead of government, which itself is often subject to delay and malfunction. Law and politics can be quite as flawed as can business, often more so; and the moral businessperson will not take advantage of outdated law or a do-nothing legislature.

That may seem too much challenge, but consider the alternative. If a company announces that it intends to make all the legal profits it can, though it concedes modest attention to ethical customs, this waves a red flag in warning. Everyone knows that such a business has to be watched like a hawk, past good faith in law and custom, so as to push it toward any deepening ethical insight. People will assume that it will become less ethical with increasing market insecurity. It will only increase its morality at the irritation of its critics, and such a firm can expect to do business in an atmosphere of hostility. The courts, public interest groups, and the press rightly conclude that they will have to drag such a firm along by steady legal and social pressures, lest it fling its legal acid into the wind or clear-cut whatever is legal in Oregon or Brazil, always in the rear, always callous in attending to the fragility or beauty of the environment, to rare species and amenities. Is this the reputation business wants? Unless a firm really is out for pure black profit, it is better to move volun-

tarily toward compliance and even to go the second mile, especially in those cases where you are soon going to be forced to it anyway. Both those within the firm and those without it will feel better about a morality that exceeds legality.

§26 THE BURDEN OF PROOF MAXIM: RECOGNIZE A SHIFTING ASYMMETRY IN ENVIRONMENTAL DECISIONS

From 1941 through 1977 the volume of manufactured synthetic chemicals increased 350 times, with many of these quite toxic to natural systems and to human biology. Even the most resilient local ecosystem cannot absorb our exhausts, pesticides, and herbicides. Even global currents cannot flush out aerosol fluorocarbons and SST exhausts. The more massive the manipulative power, the nearer one approaches the carrying capacity of the commons, the more the unintended, amplifying consequences are likely to be far-reaching. Such chemicals, unlike persons, are not innocent until proven guilty, but suspect until proven innocent. So the burden of proof shifts, and it is now up to the industrialist to dispatch it. This puts one again on the frontier, technologically and morally. Formerly nature's "invisible hand" ruled over these things, but this is no longer so.

One might have hoped that as our competence increased, risks would diminish. But the depth of upset advances even more, and we remain ignorant of our reach. Uranium was mined by the Climax Uranium Company (now AMAX) from 1951 through 1970 on the south edge of Grand Junction, Colorado. The tailings, containing eighty-five percent of the original radioactivity but thought harmless, were widely used as construction materials in thousands of homes, in schools, and in sidewalks. Not until 1970 did physicians notice a marked increase in leukemia, cleft lip and palate, and Down's syndrome. These causal links are still vague, but established enough for federal and state governments to take emergency action. What are the unknowns at the Hansen mine? (See Case 3.) The regulatory authorities could have made better guesses if they had had the latest report of the National Research Council's Advisory Committee on the Biological Effects of Ionizing Radiations (BEIR III), but during their deliberations that had not been published, because of the inability of members of the committee to reach a consensus.

With ever higher technology, it seems that our power to produce changes overshoots increasingly our power to foresee all the results of our changes. The latter takes much more knowledge. It is easier to make Kepone than to predict what it will do in the ecology of the James River estuary, easier to mine uranium and make reactors than to predict where the mutagens in the tailings will end up and what damage will result. In a way, our ignorance outpaces our knowledge. So we are asking for trouble unless we slow down the introduction of potentially more potent novel changes with adequate pretesting. The unforeseen consequences outnumber the foreseen consequences, and the bad unforeseen conse-

quences greatly outnumber the good unforeseen consequences. Serendipity is rare in high technology. Adding to the problem, many persons in business are paid to introduce changes, new products, the quicker the better. But few are employed to foresee adverse consequences and caution against them. So the government regulates to widen by law the margin of safety. But caution is also a moral requirement in these circumstances.

DDT causes cancer in mice, but it is difficult to show that it does or does not in humans, for we cannot experiment much on them, and everyone is already carrying a DDT load from its previous use. So does one conclude that, since there is no hard evidence, we should continue to use it anyway, at least where it is legal, outside the United States? We would, in effect, be experimenting on humans that way too, and making a profit during the experiment! Or does one accept the burden of proof to show that although carcinogenic in mice it does not cause human cancer? This might perhaps be done by experiments on more anthropoid mammals, or by comparative studies with synthetic chemicals that humans regularly contact, but that we have no reason to think are carcinogenic in humans, and yet that do prove to be carcinogenic in mice. It might be done by comparing more refined measurements of cancer rates with existing DDT loads as these fluctuate within diverse populations, or as they flush out across a period of years. The point is that it is moral to err on the safe side, and that business has the responsibility to argue that the risks are minimal, not to presume so, and to chance the damage. Our grandfathers when in doubt could risk a new fertilizer, but we as conscientious grandchildren must increasingly refuse to act until we prove the limits of our effects. This applies to life's necessities, but also to risks of the natural amenities, which have never before been so threatened.

§27 THE FULL-CIRCLE MAXIM: EXTEND MORAL JUDGMENTS THROUGH THE WHOLE EVENT IN WHICH YOUR BUSINESS PLAYS A PART

While the buck should not pass outside of a given company, the scope of judgment should not stop at the boundaries of that business. One should think as far outside one's business as one can. We cannot tell just by looking at the effects of our own actions, considered in isolation, whether we are acting well. Each of us is a link. Parts tied into wholes cannot be judged in themselves, but have to be judged in the resulting pattern that they constitute.²³ Hitherto an entrepreneur could skimp on this principle, because the results of his enterprise were reasonably evident to immediate parties, and any unintended consequences were likely to be neutral. But we can no longer assume that new technology or more growth is likely to be positive, or even neutral. What might look good in itself, what has always been good in past contexts, may be bad when seen full circle. Even when technology succeeds, the promised sweetness increasingly comes with much that is sour. The workers have jobs, but for miles around all suffer a blighted health and landscape. Almost invariably when high technology fails, the benefits are lost and their opposites arrive

with a vengeance. We need to consider what's left economically, if the gamble doesn't pay off. The Kepone was intended for better crops and a stronger economy, but the result is a crippled company and a poisoned James River basin (see Case 1). The failed reactor can no longer deliver its power; worse, the legacy is expensive and even impossible to clean up. Society is not in the black, nor do we go back to zero, we are deep in the red.

Ethical judgment needs to reach for the compound unit. There is no point surviving on a sinking ship, little point prospering in a deteriorating environment. We might formerly have thought that the relevant unit to consider was merely the company and its customers. Now with sophistication and a sense of danger, it needs to be society, the country, the global Earth!

§28 THE GRANDGHILD MAXIM: THINK FOR DECADES

There are strong pressures to see what the charts look like this quarter, even this week. Some say that the successful business eye has to be myopic. But this is never entirely so, and increasingly less so with the size and longevity of the modern corporation, where collective interests overleap even the lives, much less the interests, of individuals who play company roles. The Weyerhaeuser timber cycle is half a century. No big company can afford less than telescopic vision. Nor do stockholders care only about the next dividend. Most are holding their investments for ten or twenty years; the more dynamic the corporation, the more likely they intend to retire on these investments and bequeath them to their children. They want the firm to make it through the year, but in such a way that the long outlook is promising. They will take reduced profits if they believe the company is innovative and that this increases the quality of the environment in which they retire and in which their children, who inherit those investments, will live. Commercial and home loans are for twenty or thirty years. Why should the lending company think their clientele uninterested in the business stability and the quality of the neighborhood during and after the time that these loans are being repaid? Environmental spending, like that for military defense, is immediately a non-productive cost; its benefits are general and longer range.

The corporate and composite character of the big firm can permit exactly the demanded time scale. The company itself needs what is also required by social and naturalistic concerns. Beyond our grandchildren, future generations may not have much moral or biological hold on us, but if one can see as far as grandchildren, that will do operationally in the present case. Meanwhile the company need not age and die at all, it can be revitalized forever. Couple this with the fact that many of its owners and operators are on board for decades, couple that with the tendency of expediency and morality to coincide over time, and a good business head will think for decades.

§29 THE DO-TO-YOURSELF-FIRST MAXIM: IMPOSE ON OTHERS LOWER RISKS THAN YOU YOURSELF ARE TAKING

Some fishermen work both the James River and uncontaminated tributaries, mix both catches for public sale, but carefully take home a batch of the uncontaminated ones. They represent a multitude who own and operate businesses that require a hazardous waste site but who refuse to live near one, who demand power but from faraway reactors and coal-fired plants. They want goods but not risks. But no one should buy goods and not bear risks. In fact, we should do this risk-bearing without consideration of fiscal costs and their distribution. My profit never permits your poisoning—the toxin-is-trumps-maxim (see §11). But set profit aside. How then do we divide the risks that remain? You ought not impose on others risks you are unwilling to take yourself, in view of public benefits. We have to consider not just degrees of risk, but whether these are distributed equitably and voluntarily or involuntarily.

Most persons do not wish to live within one hundred miles of a hazardous waste dump or nuclear plant, and these folk ought not to demand power or goods that require others to do so. A company that sites dumps or plants any closer to a local population will impose upon them, and operators ought not to do so unless they live within this radius. Removing pollutants escalates in cost with the percentage removed and zero risk is impossible. Some risk is unavoidable, more risk profitable, and there will be cost pressures to set tolerances high. So let the maximum permissible concentration be set by researchers, themselves among the susceptible, who are ignorant of the costs and who must long breathe the air whose toxicity they define. Business is now playing with toxins, mutagens, carcinogens. Let all those involved join in the risks proportionately to the public, but never merely private interests. Without consent, one doesn't gamble with somebody else's happiness, not if the odds are one in a hundred. Nor with someone else's life, not if the odds are one in a thousand. A risk imposed on others should be several orders of magnitude below one for which you will volunteer.

§30 THE TOGETHERNESS MAXIM: WORK FOR BENEFITS THAT CAN BE HAD ONLY IN CONCERT

There is not much point in removing the sulfur from one stack if a hundred remain. One developer may drop an area upon finding that the Nature Conservancy is trying to get an option on it, but a dozen others still bid. Not only is the intended effect lost by the non-cooperation of others, the environmentally sensitive firm is disadvantaged in the market. You cannot always do the better thing and survive, while others do wrong cheaply. Competitiveness here becomes a vice because it encourages gain by eating up the commons. But what one firm cannot afford, all together can. Both the environmental and the economic contexts require that

businesses act in concert. Moral success depends on the interplay of many wills, Associations of manufacturers, power companies, and realtors often have considerable persuasive force for broad policy-setting.

Still higher, there may be governmental regulation, zoning codes, pollution standards, taxes, quotas. The historical tendency of free enterprise has been to resist these. But surely they are morally required where the alternative is private profit at public loss. The capitalism that cannot incorporate working-for-benefits-in-concert is doomed, sooner or later, to fall before socialism, if not into totalitarianism. If the association of firms proves to be only the self-interest of companies all over again, a lobby rather than conscience in concert, then we can expect again the social antagonism met earlier for announced legal profiteering (see §25). One should work for "mutual coercion, mutually agreed upon."²⁴ Perhaps no industry can be trusted entirely to police itself, perhaps we need to recognize this for ourselves and our successors as we face unknown pressures ahead. No company is an island; the bell that tolls for one, tolls for all.

§31 THE QUESTION AUTHORITY MAXIM: STAY CRITICAL OF CORPORATE PRESSURES

A corporate structure tends to deaden and fragment moral awareness. This is because of the individual's partial involvement there, because of a firm's limited functions and claims, because of its collective impersonal nature, because our paychecks lie there, and even though a corporation's long-lived semi-public character permits more moral reach than the individual can have. For many, morality goes off when the business suit goes on, when the time card goes in. We may be given, and want, a job description with sharply defined responsibilities. There are some questions we may not be encouraged to ask; you get the message that nobody here can handle them, you are socialized to forget it and get on with the job. The corporate climate may foster more interest in loyalty than in truth. Perhaps we get moral fatigue, our nerve fails, but what we ought to do is to ask all the questions we would as a parent, citizen, or consumer and give them the answers we would if we were not working for the company.

Some say that philosophy makes a person unfit for business, but this is rather only for unfitting sorts of business. Philosophy urges business by "one able to judge" (Greek, *kritikos*), and judgment is a high-class business skill. Like the university, government, or church, the corporation that cannot welcome and include its critics will grow dogmatic and archaic. There can be reformation only by those who question authority, and, if the critics stay noisy, the moral and the expedient tend to coincide over time, Rachel Carson was right about DDT, Ralph Nader was right about automobile exhausts and air pollution. Our cars, towns, and countryside are the better for them. The Alaska pipeline is better built because of its critics. Conservative business operators said, a century

back, they could not afford the abolition of slavery and child labor. They say now they cannot afford environmental responsibility. But the more philosophical executives are setting this right. The profit pressures do need moral watching. Whitehead remarked, "A great society is a society in which its men of business think greatly of their functions."²⁵ That has now come to include "thinking environmentally."

§32 THE GBEENING MAXIM: REMEMBER THAT THE BOTTOM LINE OUGHT NOT TO BE BLACK UNLESS IT CAN ALSO BE GREEN

There is no such thing as a healthy economy built on a sick environment, and we can rewrite an earlier, faulty slogan. What's good for the countryside is good for the company. Not for all companies, but we use this to test for the good ones. Running in the black is not enough if this requires our running out of the green, green being here the color of the natural currency. T. V. Learson, former president of IBM, argues for "the greening of American business," and concludes, "in the end, therefore, the whole question of the environment boils down to a value judgment, a priority setting, and the will to do something about it. Most businessmen I know have made that value judgment. They want a cleaner environment as much as anyone else. I believe they will have the *will* to press on for it too, and to help, through business leadership, in stiffening the national will."²⁶

This demand for bottom-line green is because the oceans, forests, and grasslands are the lungs of the Earth. But the reasons are more than obviously pragmatic ones. Business relations are only one of our manifold human relations with nature. This one should not preempt the others that go on after business hours, or when we are no longer consuming. These other ways of pursuing happiness are scientific, recreational, aesthetic, appreciative, pastoral, and philosophical. Both in order that business may continue and in order that we may live well after business is done, we need an environment clean enough to be green. *Clean* has two meanings here: clean in the nonpolluted sense, and clean in a non-interrupted sense. Some areas ought to be absolutely and others relatively clean of human management and intervention. Some spaces should remain rural, some wild. There should be mockingbirds and cottontails, bobwhites and pristine sunsets, mountain vistas and canyonlands. There should remain much of that sort of business which went on for the millions of years before we modern humans arrived. In this sense green is the color of life, the most fundamental business of all.

V. BUSINESS AND NATURE

Every organism must "earn its way" consuming its environment, and business activity follows the natural imperative that we must labor for food and shelter. This much of what is the case we can also endorse as

what *ought* to be. What nature requires (that we work), what is the ease (that we must work), we also morally command (one ought to work). Otherwise we cannot flourish and, in extremes, we die. That much of a bread-and-butter "work ethic" properly opposes a romantic naturalism that wants to leave nature untouched. It can celebrate how marvelously labor and management have brought the environment under our control. At the same time, every organism must be a natural fit, integrated into a life-support system. In the wild, misfits cannot flourish and are eventually eliminated. However much human business revises spontaneous nature, primarily by deliberately adapting the environment to humans rather than humans to the environment, we do not escape the fundamental requirement of inclusive fitness to our surroundings.

Thus, though we must and should work, not all our working is equally appropriate. Any business activity that contributes, even incrementally, to the reduced fitting of humans into the natural system does not really contribute to a better standard of living; it may even imperil our survival. An upset of Earth's carrying capacity is a prospect for today and tomorrow that was seldom a fear for business yesterday. Here labor and management must become sober environmentalists. Again we move from what *is* the case (how life is ecologically grounded) to what *ought* to be (how, given a humanistic environmental ethic, business ought to be environmentally alert and sensitive). Both human ecology and human ethics are inescapably environmental affairs. Locally and globally, humans are interlocked with their Earth, with material and energy inputs, throughputs, and outputs, so that here too balanced budgets are required, not less than in accountants' offices. In that sense *economic* activity sooner or later must be and ought to be deeply *ecological* activity, both adjectives having the sense of life prospering in a home place,

Bertrand Russell claimed, "Every living thing is a sort of imperialist, seeking to transform as much as possible of its environment into itself and its seed,"²⁷ But that is an overstatement, which, taken alone, leads to a social Darwinism thrusting atomistic egos and their firms into aggressive competitiveness, with nothing more. Nature has not so equipped or inclined any one form to transform very much of the environment into itself and its seed. Each life form is specialized for a niche, limited to its own sector but woven into a web so that it depends on many other species in a pyramidal, flowing biomass. Recent biology has emphasized not so much aggression and struggle as efficiency and habitat fittedness. Many animal populations limit themselves to suit their resources. If not checked from within, a species' genetic impulses are checked from without by the "natural corporation" that keeps every living thing in community.

All this is premoral, so what are we to say when, at the top of the pyramid, there emerges *Homo sapiens*, so powerful and unspecialized that, culturally evolving to where we now are, we almost can transform the Earth into ourselves and our seed? The answer lies in nature's simultaneously equipping us with a conscience, not given to non-human crea-

tures. Perhaps this conscience can now wisely direct the magnificent, fearful power of the brain and hand. A naturalistic ecological ethic seeks to realize how conscientious human activity, business included, ought to be a form of life that both fits and befits, however much it also extends, what has previously, premorally been the case. Each life form is constrained to flourish within a larger community. The planetary system carries humans most gloriously, but it cannot and ought not carry humans alone. The best of possible worlds is not one entirely consumed by humans, but one that has place for the urban, rural, and wild. Only with moral concern for the whole biological business can we do our work of living well. This ethic defends human life by balanced resource budgets. But more, it defends all life in its ecosystemic integrity,

Whether Earth was made for us is a question we leave to the theologians, who are not likely to say that it was made for us to exploit. We can meanwhile say that we were made for Earth (if not also by it), and this gives us both the power and the duty so to act that we continue to fit this Earth, the substance, the sustainer of life.²⁸

NOTES

1. October 5, 1976. U.S. District Court, Eastern Division of Virginia, Richmond. Judge Merhige's statements were made from the bench at the time of sentencing. The fine was technically reduced to five million dollars when Allied placed eight million dollars into a fund to reduce damages.
2. Hugh H. Iltis, "The Biology Teacher and Man's Mad and Final War on Nature," *American Biology Teacher*, 34 (1972), pp. 127-37, 201-21, especially p. 201f. While this article was in press, the Jari project passed into the control of a consortium of Brazilian operators, owing to Mr. Ludwig's age and to financial difficulties. The environmental outlook of the new owners remains to be seen.
3. For details of the Hansen project I am indebted to an unpublished paper by Thomas J. Wolf.
4. Louis B. Lundborg, *Future without Shock* (N. Y.: W. W. Norton, 1974), p. 128f.
5. Compare a report by Marshall Frady in *Harper's Magazine*, Vol. 240, No. 1440 (May 1970), p. 103.
6. Henry B. Schacht and Charles W. Powers, "Business Responsibility and the Public Policy Process," in Thornton Bradshaw and David Vogel, eds., *Corporations and Their Critics* (N.Y.: McGraw-Hill, 1981), pp. 23-32.
7. See *Time*, October 6, 1961, p. 24. More accurately, Wilson once reported, "For years I thought that what was good for our country was good for General Motors, and vice versa."
8. Garrett Hardin, "The Tragedy of the Commons," *Science*, 162 (December 13, 1968), pp. 1243-48.
9. *Final Report of the National Science Foundation Workshop Panel to Select Organic Compounds Hazardous to the Environment* (Washington, D.C.; National Science Foundation, September 1975), p. 8.
10. *Cost of Government Regulation Study for the Business Roundtable* (Chicago: Arthur Andersen and Company, 1979); *The Business Roundtable Air Quality Project* (November 1980).

11. Aldo Leopold, "The Round River," in *A Sand County Almanac* (N.Y.: Sierra Club/Ballantine Book, 1970) p. 190.
12. H. E. Wright, Jr., "Landscape Development, Forest Fires, and Wilderness Management," *Science*, 186 (1974), pp. 487-95, citation on p. 494.
13. Francis Bacon, *Novum Organum, Works* (N.Y.: Garrett Press, 1968) 1:157; cf. 4:47.
14. Quoted in Robert Cahn, *Footprints on the Planet* (N.Y.: Universe Books, 1978), p. 107.
15. Theodore Roosevelt in a speech delivered there, recorded in the *New York Sun*, May 7, 1903.
16. Alfred North Whitehead, *Science and the Modern World* (N.Y.: Mentor Books, New American Library, 1925, 1964), p. 175.
17. Jeremy Bentham, *The Principles of Morals and Legislation* (1789) (N.Y.: Hafner, 1948), ch. 17, sec. 4, p. 311.
18. Nicholas Wade, "New Vaccine May Bring Man and Chimpanzee into Tragic Conflict," *Science*, 200 (1978), pp. 1027-30, citation on p. 1030. See also Paul R. and Anne Ehrlich, *Extinction* (N.Y.: Random House, 1981), pp. 60-61.
19. Walter J. Hickel, *Who Owns America?* (Englewood Cliffs, N.J.: Prentice-Hall, 1971), p. 151. The decision halted further oil and gas leasing in the Sespe Condor Sanctuary, March 9, 1970.
20. After Laurence Tribe, "Trial by Mathematics: Precision and Ritual in the Legal Process," *Harvard Law Review*, 84 (April 1971, No. 6), pp. 1329-93, on p. 1361.
21. William G. Pollard, "A Theological View of Nuclear Energy" in the *Let's Talk About* series interpreting nuclear power to the public, published by the Breeder Reactor Corporation, an association of 753 electric systems, Oak Ridge, Tennessee.
22. Milton Friedman, "The Social Responsibility of Business Is To Increase Its Profits," *New York Times Magazine*, September 13, 1970, pp. 32-33, 122-26, quotation on p. 33.
23. To adapt a more technical ethical distinction, this requires a teleological concern against a deontological naivete. One cannot judge the tightness of an act in itself, but has to consider the outcomes of it.
Hardin, "The Tragedy of the Commons," p. 1247.
25. Alfred North Whitehead, *Adventures of Ideas* (New York: The Free Press, 1967), p. 98.
26. T. V. Learson, "The Greening of American Business," *The Conference Board Record*, 8, no. 7 (July 1971), pp. 21-24, quotation on p. 22.
27. Bertrand Russell, *An Outline of Philosophy* (N. Y.: New American Library, Meridian Books, 1974), p. 30.
28. The author wishes to thank Richard D. Steade of the Colorado State University College of Business for a number of helpful suggestions.

SUGGESTIONS FOR FURTHER READING

Ethical concerns in environmental affairs, as these affect business, are found in many diverse but interrelated areas, among them environmental ethics, environmental economics, environmental law and politics, natural resource conservation, national and international development, geography, technology and civilization, human ecology. The following list will lead deeper into these issues.

Vincent Barry, "Ecology," ch. 9 in *Moral Issues in Business* (Belmont, Calif.: Wadsworth, 1979).

Tom L. Beauchamp, and Norman E. Bowie, "Environmental Responsibility," ch. 8 in *Ethical Theory and Business* (Englewood Cliffs, N.J.: Prentice-Hall, 1979).

Herman E. Daly, ed., *Economics, Ecology, Ethics: Essays Toward a Steady-State Economy* (San Francisco; W. H. Freeman, 1980).

D. J. Davison, *The Environmental Factor: An Approach for Managers* (N. Y.: John Wiley and Sons, Halsted Press, 1978).

Jean Dorst, *Before Nature Dies* (Boston; Houghton Mifflin, 1970).

Nicholas Holmes, ed., *Environmental and the Industrial Society* (London; Hodder and Stoughton Educational Services, 1976).

H. Jeffrey Leonard, J. Clarence Davies III, and Gordon Binder, eds., *Business and Environment: Toward Common Ground* (Washington, D.C.: The Conservation Foundation, 1977).

George F. Rohrlich, *Environmental Management* (Cambridge, Mass.: Ballinger, 1978).

Donald Scherer and Thomas Attig, *Ethics and the Environment* (Englewood Cliffs, N.J.: Prentice-Hall, 1983).

Presson S. Shane, "Business and Environmental Issues," in *Ethical Issues in Business: A Philosophical Approach*, Thomas Donaldson and Patricia H. Werhane, eds., (Englewood Cliffs, NJ.; Prentice-Hall, 1979).

Manuel G. Velasquez, "Ethics and the Environment," ch. 5 in *Business Ethics: Concepts and Cases* (Englewood Cliffs, N.J.: Prentice-Hall, 1982).

§1. There is more detail on the Kepone case in Beauchamp and Bowie (see reference above). See also Marvin H. Zim, "Allied Chemical's \$20-Million Ordeal with Kepone," in *Fortune*, 98, no. 5 (September 11, 1978), pp. 82-90, and Frances S. Sterrett and Caroline A. Boss, "Careless Kepone," in *Environment*, 19, no. 2 (March 1977), pp. 30-37, and references there. For a discussion of the Jari project see William M. Denevan, "Development and the Imminent Demise of the Amazon Rain Forest," *The Professional Geographer*, 25 (1973), pp. 130-35; A. Gómez-Pompa, C. Vázquez-Yanes, and S. Guevara, "The Tropical Bain Forest: A Nonrenewable Resource," *Science*, 177 (1972), pp. 782-65; Norman Gall, "Ludwig's Amazon Empire," *Forbes*, 123, no. 10 (May 14, 1979), pp. 127-44; Philip M. Fearnside and Judy M. Rankin, "Jari and Development in the Brazilian Amazon," *Interiencia*, 5 (1980) pp. 146-56. For radiation risks from uranium tailings see D. G. Crawford and R. W. Leggett, "Assessing the Risk of Exposure to Radioactivity," *American Scientist*, 68 (1980), pp. 524-36. See also a suggestion for §26.

§2. For more on stakeholders, see Schacht and Powers, note 6 above. For a survey of environmental concerns in corporate policy see Leonard Lund, *Corporate Organization for Environmental Policymaking* (N.Y.: The Conference Board, 1974), Report No. 618.

§1. Mobile Oil's ad, "The \$66 Billion Mistake," in *The New York Times*, February 1, 1973, p. 35, favoring California over federal standards, illustrates corporate foot-dragging. Du Pont's extensive lobbying and advertising against fluorocarbon aerosol bans, despite mounting evidence of their depletion of the ozone layer, is illustrated by an ad in *The New York Times*, June 30, 1975, p. 30. The Reserve Mining Company case discussed in Beauchamp and Bowie (reference above) is another example.

§7. See David Burnham, "The Case of the Missing Uranium," *The Atlantic Monthly*, Vol. 243, no. 4 (April 1979), pp. 78-82. For examples of corporations dodging release of information about waste emissions, including the Savannah River case, see the *Freedom of Information Act Oversight: Hearings before a Subcommittee of the Committee on Government Operations*, House of Representatives, July 14, 15, 16, 1981 (Washington, D.C.: U.S. Government Printing

Office, 1981), testimony of Ralph Nader (p. 330), and James M. Fallows, *The Water Lords* (N.Y.: Grossman, 1971), especially ch. 9. See also *Toxic Substances and Trade Secrecy* (Washington, D.C.: Technical Information Project, 1977), containing the proceedings of a conference supported by the National Science Foundation, especially the article "Toxic Substances and Trade Secrecy: Rights and Responsibilities" by William Blackstone, reprinted in Scherer and Attig, *Ethics and the Environment* (see general references).

§7. For the pros and cons of discounting, especially with reference to natural amenities, see Anthony C. Fisher and John V. Krutilla, "Resource Conservation, Environmental Preservation, and the Rate of Discount," *Quarterly Journal of Economics*, 89 (1975), pp. 358-70.

§11. See for instance the dismal record of U.S. Steel, itemized by John R. Quarles, Jr., "American Industry: We Need Your Help," in Leonard et al., *Business and Environment: Toward Common Ground* (reference above). For public opinion on environmental issues and business, see "The Public Speaks Again: A New Environmental Survey," *Resources*, No. 60 (September-November 1978), pp. 1-6. See also suggestions under §20.

§12. For steady-state economics, see Herman Daly (reference above).

§14. For estimates of little-known and unknown Amazon plants that may prove medically useful, see Nicole Maxwell, "Medical Secrets of the Amazon," *Americas*, 29, nos. 6-7 (June-July 1977), pp. 2-8. For how little we really know even about the lands North Americans have long inhabited, including New England and the Midwest, see Wright, note 12.

§18. For the difficulties of heavy technology on fragile land see *An Assessment of Oil Shale Technologies* (Washington, D.C.: U.S. Government Printing Office, 1980), prepared by the Congressional Office of Technology Assessment.

§19. For the treatment of animals, see Peter Singer, *Animal Liberation* (N.Y.: New York Review Books, 1975), with discussion of the Drake test on p. 50f, and veal calves, pp. 127-35. For lead versus steel shot, see U.S. Fish and Wildlife Service, *Final Environmental Statement: Proposed Use of Steel Shot for Hunting Waterfowl in the United States* (Washington, D.C.: U.S. Government Printing Office, 1976). The report finds no adverse crippling with steel shot.

§20. Attitudes of Americans toward endangered species are reported in *Public Opinion on Environmental Issues*, Resources for the Future Survey for the Environmental Protection Agency, et. al. (Washington, D.C.: U.S. Government Printing Office, 1980), p. 18. The alarming acceleration of extinction rates is discussed in *Environmental Quality -1980*, Eleventh Annual Report of the Council on Environmental Quality (Washington, D.C.: U.S. Government Printing Office, 1980). See also *The Global 2000 Report to the President*, Council on Environmental Quality and Department of State (Washington, D.C.: U.S. Government Printing Office, 1980). See also Norman Myers, *The Sinking Ark* (Oxford: Pergamon Press, 1979) and Paul and Anne Ehrlich, *Extinction* (note 18).

§23. For environmental policies in banking and finance, see Cahn (note 14), pp. 124-40, who reports that only six in thirty of the major commercial banks have environmental policies, none of these very specific, but found also the positive records of John Hancock, Equitable, and Aetna.

§28. See the *Progress Report on the Grand Junction Uranium Mill Tailings Remedial Action Program*, prepared by the U.S. Department of Energy's Division of Environmental Control Technology, the DOE Grand Junction Office, and the Colorado Department of Health, February 1979, and available from the National Technical Information Service. The report of the Committee on the Biological Effects of Ionizing Radiations, *The Effects on Populations of Exposure to Low Levels of Ionizing Radiation: 1980* (BEIR III), has since been published (Washington, D.C.: National Academy Press, 1980), but the much-troubled report was never released without dissent among committee members. The ozone

threat involves uncertain but drastic and far-reaching environmental degradation. Du Pont has persistently claimed that the connection between fluorocarbons and ozone depletion is not yet proved. The details of this case (given in the Velasquez reference above) provide a good discussion of the necessity for a shifting burden of proof.

§29. Public opinion about living near risk sites is recorded in *Public Opinion on Environmental Issues* (reference under §20 above), p. 31.

§30. See Kenneth R. Andrews, "Can the Best Corporations Be Made Moral?" *Harvard Business Review*, 51, no. 3 (May-June 1973), pp. 57-64.