

# ECOLOGY AND THE DEATH OF PROVIDENCE

by *Garrett Hardin*

Why are ecologists and environmentalists so feared and hated? This is because in part what they have to say is new to the general public, and the new is always alarming. Moreover, the practical recommendations deduced from ecological principles threaten the vested interests of commerce; it is hardly surprising that the financial and political power created by these investments should be used sometimes to suppress environmental impact studies. However, I think the major opposition to ecology has deeper roots than mere economics; ecology threatens widely held values so fundamental that they must be called religious. An attack on values is inevitably seen as an act of subversion.

## ECOLOGICAL SUBVERSIVENESS

The ecologist Paul Sears was apparently the first to call ecology subversive; he was followed by Paul Shepard and Daniel McKinley who made *The Subversive Science* the title of a collection of essays.<sup>1</sup> The charge generally has been regarded as sound by both the ecologists and their opponents. It is significant that Sears chose the adjective "subversive" rather than "revolutionary." The latter (and more fashionable) term comes from the Latin verb *revolvere* and is apt to connote an alteration that is as impermanent as the changing of the palace guard in a military dictatorship; no doubt this is what some of the opponents of "the ecological revolution" hope it will be. The word "subversive" is, to my mind, better fitted to describe the sort of change ecological insight brings about. *Sub* means under or below, and *vertere* means to turn. To subvert a world view is to change it from below (which is where the foundations of any subject are to be found). Subversion is more profound than revolution.

In what way does the ecological view subvert the political and economic faiths we live by? We must ask first who is "we"? I suggest

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that our inquiry be limited to people living at the present time in the North Atlantic version of civilization, particularly the American variety. The extent to which what I have to say is true of other civilizations is a topic for other times, other places. As for our own culture, I wish to express a sympathy with those who draw back from a rational, ecological analysis of our way of life. I think it is inappropriate to dismiss their views as simply irrational. We need to plunge beneath the surface of their rhetoric. Ralph Waldo Emerson truly remarked that "we are wiser than we know," an idea that the scientist-philosopher Michael Polanyi elaborated on in his exposition of what he called "tacit knowledge."<sup>2</sup> If the creative mind is indeed a sort of computer it is one that is characterized in this remarkable way: Most of the time its "programs" run to completion without producing any explicit readouts. Our more mundane behavior we attribute to habit; less repetitive and more surprising behavior we ascribe to intuition. "Readout" seems too definite a term to apply to the products of that veiled computer we call "mind."

Hidden deeply behind the veil are repressive mental processes that generate taboo, which takes the form of silence or nonaction. In its most effective form taboo prevents any readout at all, since a taboo "is a sort of Chinese egg. Inside is the primary taboo, surrounding a thing that must not be discussed; around this is the secondary taboo, a taboo against even acknowledging the existence of the primary taboo."<sup>3</sup> The double nature of taboo has not been generally recognized, but a little thought shows that this bivalence is necessary for the stability of a taboo. If only the primary taboo existed, its power, like Rumpelstiltskin's, could be shattered by a single word. A univalent taboo would not long be operational.

Case studies of the creative process show that the generation of intellectual novelty takes place first in the unconscious.<sup>4</sup> If the unconscious mind senses a painful incompatibility between the unfolding intellectual novelty and the traditional values it is committed to, the mind is all too likely to put an end to inquiry by imposing a taboo on further thought. Since the imposition cannot be explicitly acknowledged, the maneuver is covered over with clever rhetoric. Once we understand the origin of such rhetoric we become somewhat tolerant of it. To protect rather than examine inherited values is all too human an impulse. Simple decency dictates that we deal compassionately with individuals who disguise taboo with rhetoric; but concern for the long-term well-being of society demands that we be intolerant of anything that protects inconsistencies in action. Those of a scientific bent assume that the dissolution of inconsistencies is, in the long run, the least painful policy.

ECOLOGICAL CHECKS ON CONTEMPORARY VALUES

How do ecological insights conflict with contemporary workaday values? Without claiming exhaustiveness I suggest five major areas of conflict, clustering around the codewords "limits," "scale effect," "interrelatedness," "development," and "irreversibility." Let us explore these one by one.

*Limits.* The progress of pure science can be measured by its discovery of conservation laws, which presuppose limits. When the laws are worded with practical aims in mind we have what Edmund Whittaker called "impotence principles." By contrast, the world outside science for the past two centuries has been inspired largely by the anticonservation orientation we call the "idea of progress."<sup>5</sup>

In the popular view this idea justifies us in presuming that there are no limits worth mentioning: In planning for the future we simply assume that the world is a cornucopia. The perils of this assumption are obscured effectively by the bias of the record: Those who lose by making it are wiped out, whereas those who prosper survive to bear witness to the wisdom of the cornucopians' position. The crunch comes whenever the last prediction of the cornucopians is thwarted. Unfortunately the next-to-last prediction seems innocent enough.

*Scale Effect.* If conflicting values are related to population size by variables that have different exponents, the action that is judged best necessarily changes with change in population size. The politico-economic system of the commons can work well with less than 150 people in the community but breaks down and must be replaced by one of two other possible systems when the number goes higher.<sup>6</sup> Rhetoric applicable only to small communities is called upon all too frequently to prevent the modifications required by growth to a larger size.<sup>7</sup>

*Interrelatedness.* The sanctions of traditional ethical systems paradoxically presume an almost systemless ambience in which to operate. Ecologists know that nothing can escape the web of life, and precisely where an entity stands in the web is important in determining the best action. The behavior of each entity influences the state of many other entities: "We can never do merely one thing."<sup>8</sup>

I think ecologists can take credit for getting people at last to take the web of life seriously, but now our success has created the dialectical danger of "too much of a good thing."<sup>9</sup> Consider, as an illustration of going too far, this advice given by a scholar of literature who became converted to ecology: "If a decision taken in Moscow or Washington

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can effect a catastrophic change in the chemical composition of the entire biosphere, then the idea of a San Francisco, or Bay Area, or California, or even North American ecosystem loses much of its clarity and force. Similar difficulties arise when we contemplate the global rate of human population growth. All this is only to say that, on ecological grounds, the case for world government is beyond argument."<sup>10</sup>

This is asking for trouble. We can grant of course that if a decision made in one city can cause indeed a catastrophic change that is global, then global decisions will be necessary. The greenhouse effect, if it proves as bad as we fear, will require global cooperation to control the emissions of carbon dioxide, nitrous oxides, and other atmospheric pollutants. But let us not forget that global cooperation is always more difficult to obtain than local. It is a mistake to adopt a policy of preferring the global approach to a local one. If Lake Cayuga is polluted it is pretty silly to try to get Moscow, Paris, and Rome to share the responsibility for cleaning it up. I sometimes suspect that those who systematically prefer global solutions are driven by a death wish.

What then are we to make of the cliché "global population growth"? Population does not grow globally: It grows very locally, at each spot occupied by a fertile woman. When we are dealing with the problems created by a too large population of deer we do not dream of seeking a global solution. The "population problem" is shorthand for a "population-to-resources ratio." In animal and plant demography population problems always presuppose a local habitat. When there are too many reindeer on Saint Matthew Island no one is so foolish as to speak of a "global reindeer population problem."<sup>11</sup> To any such problem there are only two possible rational solutions: Reduce the size of the local population, or increase the local carrying capacity. For animals other than man, the second approach is usually out of the question. That leaves only the first.

What about man? For two centuries we have had marvelous success in increasing the carrying capacity of the environment. Each major technological revolution has been reflected in a demographic salutation, as Edward S. Deevey, Jr., has pointed out.<sup>12</sup> Those who take limits seriously, however, cannot believe that the demographic effects of the present revolution—the scientific-industrial revolution—can keep pace forever with the present rate of population growth, which is exponential. Someday, if we unwisely insist on viewing population as a global problem, we shall have either to find ways of globally reducing population or to give up all attempts to solve the problems; this would mean turning it over to forces of the purest Malthusian sort. The population problem is, more than most problems, a seman-

tic one. We are the inheritors and the victims of a sharing rhetoric that was developed in a tribal setting.<sup>13</sup> Sometime during the 1950s we unconsciously started applying tribal rhetoric to nontribal situations, generating the new terms “global hunger” and “world hunger.” To speak of global hunger is to imply that hunger is not spatially limited; this implies that the ownership of resources is not spatially limited; in turn this implies that the world must be treated as a commons. Since it is beyond doubt that there is no positive responsibility in a commons once the size of the population exceeds a hundred people or so, the predictable and certain result of thoughtlessly succumbing to the rhetoric of global hunger is tragedy.<sup>14</sup> Though hunger is not global the tragedy generated by presuming so will be global; when it comes it will be an unprecedented event in the history of mankind.

*Development.* Does time matter? Heraclitus in the fifth century B.C. said it mattered greatly: “You cannot step twice into the same river.” This Greek insight was largely lost in the first growth of science after the Renaissance, dominated as it was by physics. Time came back into the picture in the nineteenth century with the creation of the concept of entropy—“time’s arrow,” as A. S. Eddington later called it.<sup>15</sup> Geology also made much of time but on a scale too great for easy human comprehension. Ecology, with its study of succession and synergy, brought the human scale back in. Ecologists pointed out that a biocide that reduces the population of an insect pest in year 1 may increase it greatly by year 5, much to the surprise of the timeless minds of engineers and so-called developers.<sup>16</sup> Every well-meant intervention in the web of life is challenged by ecologists with the Heraclitian question, “And then what?” Since the intentions of would-be interveners are noble, this chilling question evokes vituperation, as Rachel Carson discovered.<sup>17</sup> But Carson was right, and so was Heraclitus.<sup>18</sup> “Developers” and “promoters” have yet to acknowledge this fact fully; perhaps by their nature they cannot.

*Irreversibility.* The final major concept substantially lacking from the conventional wisdom of promoters is the idea of irreversibility. It is not in their interest of course to admit that the damage they do may be irreversible, or practically so. “Develop now—worry later” is their motto. Childishly they assume that science will provide an answer—in time. Stripminers manage to get legislation passed that permits them to continue their destructive business by posting a bond of a mere five hundred dollars per acre, though there are sites where it is doubtful if ten thousand dollars could create an acceptable substitute for the beauty destroyed. We continue to load the atmosphere with gaseous

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pollutants, and the earth and water with long-lived radionuclides, trustfully assuming that we are causing no irreversible harm.

### THE RELIGION OF PROGRESS

I will spend no more time on a substantive analysis of the major areas of conflict between ecologists and promoters because I think we need to plunge into a deeper level to gain a sympathetic understanding of the anguish of the promoters, an anguish, I believe, that can be called truly religious. The word "religion" is ambiguous and overused, so its introduction here needs justifying. The etymology of the word is uncertain, but according to the *Oxford English Dictionary* a highly probable root is *religare*, to bind. We may define religion as that which binds our views of the world; it also binds the men and women holding a particular set of views. It is not surprising that our most conservative impulses show themselves in the defense of religious beliefs.

Whenever a social arrangement or intellectual orientation has a name, our desire to conserve that which has long existed is satisfied often by conserving the name even though the fact behind the name changes. Thus it has come about that England has a "monarch" who does not rule, and America an electoral college that does not elect. "Institutions may with impunity be altered or destroyed," said Will Durant, "if their names are left unchanged."<sup>19</sup>

Not so well recognized is the fact that conservation sometimes takes the opposite path, the name being abandoned in the face of critical attack while the concept is preserved under a new name. That our civilization has been powered by the idea of progress during the past two centuries is widely recognized. For most people progress has been largely held to mean technological progress. Many observers, Norbert Wiener among them, have noted that the fervor with which we cling to progress implies that it is a religious concept.<sup>20</sup> The vulgar motto "You can't stop progress!" is no longer fashionable, but a very able physicist, Freeman J. Dyson, recently gave the thought new life in his essay, "The Hidden Costs of Saying NO!" Dyson begins by quoting, with obvious approval, a poet who was hardly an apostle of technological progress, William Blake: "You never know what is enough unless you know what is more than enough." In other words, confronted with the potential dangers of mass supersonic travel, large-scale chemical pest control, worldwide nuclear energy, global climatic alterations, preservation of food by x-radiation, and uncontrolled genetic engineering, our motto always should be "Experiment now—pay later!" For such as Dyson technological progress is seen as an ethical imperative.<sup>21</sup>

The guidebook to the exhibits of the 1933 "Century of Progress" World's Fair in Chicago boldly stated: "Science discovers—Industry applies—Man conforms."<sup>22</sup> Resistance to this imperative is regarded as irrational. As one editor (of *Look*) put it, "a strong case can be made for positing the onset of the Age of Unreason in America at the instant when Rachel Carson's *Silent Spring* was unleashed on a moderately happy and justifiably tranquil populace."<sup>23</sup> This statement occurs in a chapter entitled "The Worst of Madmen," in a book called *The Disaster Lobby*, which bears the subtitle, *Prophets of Ecological Doom and Other Absurdities*. The editor of the journal *Nature* concurs in spirit by entitling his book, *The Domsday Syndrome*, which the dust jacket identifies as "an attack on pessimism."<sup>24</sup> Antiecologists at Sussex University entitled their attack *Models of Doom*.<sup>25</sup> A very capable promoter of unlimited hydroelectric power in the northwest categorized his opponents in the following terms: "The environmental movement has fallen into the hands of a *small, arrogant faction which is dedicated to bringing our society to a halt*. . . . The environmental extremist . . . is . . . a *spoiler*."<sup>26</sup>

What is it about the ecological orientation that upsets these critics? Just this: that the ecologist insists that we ask the time-binding question "And then what?" before we go off half-cocked. During all of man's history on earth, except for the last two hundred years, asking this question was viewed as the mark of a mature, thoughtful person. It is one of the wonders of the world that the great question "And then what?" is now regarded as the demand of a crackpot. Crackpots, ecofreaks, neo-Luddites, pessimists, bird watchers, pansy pluckers, merchants of doom, spoilers—the semantic defenses against a return to the wisdom of the ages are legion. Antiecologists would, if they could, repress the great question completely. At times, their religious fervor has a querulous cast. A recent set of "institutional" defenses of technological progress put out by an electric company had as its leitmotif these two sentences, in boldface: "Science and technology can solve many problems. If they don't, what else will?"<sup>27</sup> The latter was intended undoubtedly to be merely a rhetorical question. One of the pamphlets plaintively pleaded, "Let's put the magic back in the marketplace."

GOD = PROVIDENCE = PROGRESS

Magic. Religion. How did progress come to be linked up with these ideas, these feelings? I think a good case can be made for the term "progress" being the most recent verbal form of an idea that earlier went under the label "providence," which in turn was a still earlier

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rewording of "god." The word "god" of course stands for a vast array of predications. The only one we are concerned with here is that preserved in the word "providence." The meaning of philosophical terms such as this cannot be discovered as easily as the meaning of terms such as "chemical valence," "genetic dominance," or "ecological succession," so I shall lean heavily on the works of recognized theological authorities, namely, W. T. Davison and Theodorus P. van Baaren.<sup>28</sup>

The word "providence" comes from the Latin *providentia*, meaning foresight. Providence is an act of providing or provisioning for the future. Long before Christ this act came to be viewed as characteristic of the deity. The transition from property to person was made easily. After Caesar Augustus, Providence was a synonym for God, and "Providence," says van Baaren, "is the quality in divinity on which man bases his belief in a benevolent intervention in human affairs and the affairs of the world he inhabits." In a strict and narrow etymological sense, a climatologist with a prevision of a global catastrophe brought about by a temperature change of a few degrees may be said to be taking a providential view, but such is not the usage. As van Baaren says, "benevolence is the primary requirement" of what we call Providence.

For centuries the equation God = Providence merely created a harmless redundancy in the language. In the eighteenth century, however, the equivalence became the means whereby the concept of God escaped the suppression of the word "God." The Age of Reason, as this period was called, brought with it a widespread, overt acknowledgement of personal atheism. In earlier days many an atheist hesitated to admit his disbelief; in the eighteenth century, in certain circles, the contrary was the case. "Atheism is the vice of a few intelligent people," said Voltaire, and Robespierre remarked that "atheism is aristocratic."<sup>29</sup> No doubt many people who believed in God hesitated to pronounce the name. The word "providence" saved them the embarrassment. By whomever used, the newly fashionable word implied benevolence.

So did the word "progress." As appeals to and praises of technological progress became ever more common in the nineteenth century, it was obvious that progress was nothing if not benevolent. The equation had grown: God = Providence = Progress. The idea of benevolence was one more stage removed from the idea of God, making its nearly universal acceptance much easier.

There is another aspect of the idea of deity that needs clarifying. Theologians, wrestling with many different conceptions bearing the singular name of God, distinguish between transcendent gods and



immanent gods. A transcendent god stands outside the world (as a puppeteer stands outside his miniature puppet theater), manipulating the actors to produce the results he wants. Transcendent gods have been given a hard time by the increasingly rigorous skepticism of science.

Matters have not been so bad for immanent gods. Immanent literally means "indwelling"; an immanent god dwells inside all objects and forces. An immanent god does not meddle in everyday affairs, does not arbitrarily intervene in the workings of nature. Those who believe in this God believe in his immanence; those for whom God has dropped out of the picture, for whom Providence has been replaced by progress, perceive a depersonalized, benevolent immanence in things. The publisher of *Scientific American*, for instance, said: "If ever an invention arrived on earth in the nick of time, it was the discovery and release of the energy of the nucleus of the atom."<sup>30</sup> This is a most remarkable assertion. If it implies anything, it is that if we had not learned how to extract energy from the atom in 1942 the early death of civilization (if not of mankind) now would be certain. Mankind has lived for hundreds of thousands of years with an energy supply that was increasing yearly at a rate so low as to be perceptibly near zero; yet from now on, it is asserted, we cannot survive without an energy supply that is doubling every fourteen years or less into perpetuity.<sup>31</sup> *Homo sapiens*, tamer of fire, domesticator of animals and plants, inventor of writing, designer of computers, fabricator of satellites, and traveler to the moon, suddenly is grown too stupid to do what all other animals and plants can do, that is, live within a fixed energy budget. I do not believe it.

The publishers of highbrow magazines and of lowbrow ones are united in accepting the technological imperative and the benevolent immanence of progress. One recalls the words of a nineteenth-century hymnist:

Though every prospect pleases,  
And only man is vile:  
In vain with lavish kindness  
The gifts of God are strown;  
The heathen in his blindness  
Bows down to wood and stone.<sup>32</sup>

To bring this fashionably up to date one need only substitute "ecological man" for "man" and "heathen," while "wood and stone" now become honest cost accounting, impotence principles, and a willingness to live in a world that has physical limits. So say the worshippers of progress.

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### THE RELIGION OF ECOLOGY

What do we gain by seeing the struggle between ecologists and anti-ecologists as a religious struggle? The wars of religion have been notably bloody; they are hardly the sort of thing a wise man seeks. I can reply to the objection only as an ecologist, as one who thinks the ecological approach—however many mistakes we ecologists (mere humans) may make—is fundamentally right. The religion called progress is built on two dogmas: (1) The Dogma of Aladdin's Lamp: If we can dream of it, we can invent it. (2) The Dogma of the Technological Imperative: When we invent it, we are required to use it.<sup>33</sup>

The religion called ecology—and let us admit it is a religion, a set of beliefs that bind us—also is built on two dogmas, the contradiction of the ones just given: (1) The Dogma of Limits: Not all things are possible (though death is!). (2) The Dogma of Temperance: Every “shortage” of supply is equally a “longage” of demand; and, since the world is limited, the only way to sanity ultimately lies in restraining demand.<sup>34</sup>

At the root of our troubles is the very human desire to be taken care of as a little child is taken care of—by a parent, by God (a “father figure”), by Providence, or by progress. As we wrestle with our problems we want to be helped by a transcendental—or immanent—and benevolent force. We choose to forget what Benjamin Franklin said: “God helps those who help themselves.”

The eventual demise of the idea of progress was foreseen by the great historian of the idea. In the moving epilogue to his book, J. B. Bury wrote:

Will not that process of change, for which Progress is the optimistic name, compel “Progress” too to fall from the commanding position in which it is now, with apparent security, enthroned? . . . A day will come, in the revolution of centuries, when a new idea will usurp its place as the directing idea of humanity. Another star, unnoticed now or invisible, will climb up the intellectual heaven, and human emotions will react to its influence, human plans respond to its guidance. It will be the criterion by which Progress and all other ideas will be judged. And it too will have its successor.<sup>35</sup>

Every successor to “progress” is in danger of being tarred by the brush of benevolence. What we are loath to admit is that in a limited world the pleasure of benevolence must be sought in reducing longages of desire, not in vainly expecting shortages of supply to disappear.

Benevolent progress is a religious idea. When we see the conflict of our time as fundamentally a religious one we may be able to solve it. One can hardly argue against progress, *properly understood*, but our

problem is to give meaning to these italicized words. At the moment perhaps only two aspects of the progress of tomorrow are clear: Progress will no longer be equated with technological progress alone, and the concept of progress must be divested of the illusion of Providence. "Man makes himself," Jean Paul Sartre said, and it is high time that we try to reshape human beings into mature creatures who no longer depend on the support of a benevolent Providence (under any name).

NOTES

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27. Published in 1978 by Gould, Inc., 10 Gould Center, Rolling Meadows, Illinois 60008.
28. *Encyclopaedia of Religion and Ethics* (1928), s.v. "Providence"; *Encyclopaedia Britannica*, 15th ed., s.v. "Providence."
29. From H. L. Mencken, *A New Dictionary of Quotations* (New York: A. A. Knopf, 1942).
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31. Piel makes no such explicit statement; but his statement presumes that the recent rate of growth in energy use—5 to 8 percent per year—must be the norm from now on. A 5-percent growth rate means a doubling time of fourteen years; 8 percent, nine years.
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33. Hardin (n. 7 above).
34. *Ibid.*
35. Bury (n. 5 above).