PAUL R. EHRLICH

BETRAYAL *of* SCIENCE *and* REASON

How Anti-Environmental Rhetoric Threatens Our Future

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A SHEARWATER BOOK

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SCIENCE
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To the memory of Senator John Heinz
and to Teresa Heinz, who carries on his work

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Contents

CHAPTER 1

A Personal Odyssey

> "One of the penalties of an ecological education is that one lives alone in a world of wounds. . . . An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise."
>
> —Aldo Leopold, 1953[1]

THE TIME HAS COME to write a book about efforts being made to minimize the seriousness of environmental problems. We call these attempts the "brownlash" because they help to fuel a backlash against "green" policies. The brownlash has been generated by a diverse group of individuals and organizations, doubtless often with differing motives and backgrounds. We classify them as brownlashers by what they say, not by who they are. With strong and appealing messages, they have successfully sowed seeds of doubt among journalists, policy makers, and the public at large about the reality and importance of such phenomena as overpopulation, global climate change, ozone depletion, and losses of biodiversity. In writing this book, we try to set the record

straight with respect to environmental science and its proper interpretation. By exposing and refuting the misinformation disseminated by the brownlash, we hope to return to higher ground the crucial dialogue on how to sustain society's essential environmental services.

In addressing the brownlash, we feel we have come about full circle. We started out in the 1960s, joining forces with others to warn about the environmental damage being caused by the overexpanding human enterprise. For a while, the world responded, and substantial gains were made both in slowing some aspects of the damage and in educating the public about its significance. Now we and other environmental scientists find ourselves once again struggling to preserve those gains and to keep global environmental deterioration from escalating beyond repair.

Yet there is a key difference between then and now. In the 1960s, people were largely unaware of environmental issues; indeed, environmental science as a distinct discipline did not even exist. All that has changed. Human beings know enormously more about how their world works now than they did a mere half-century ago. Our own area of interest—ecology and evolutionary biology—has exploded in that period, revealing (among many other things) that interactions between human beings and their physical and biological environments are far more complex than imagined earlier. What has been discovered is both fascinating and disturbing—ranging from ways people have altered the atmosphere to the evolutionary origins of toxic compounds in plants. This new knowledge could help open the doors to a sustainable future in which human satisfaction could become greater and more widespread than at any time since the invention of agriculture.

Yet at the same time that brownlash activities are intensifying, the conclusions and predictions of concerned environmental scientists are being increasingly substantiated as more data are gathered and computer and analytic models are refined.[2] Indeed, scientists from disciplines as diverse as physics, chemistry, geology, and molecular biology, including many Nobel laureates, now support the conclusions of their colleagues in environmental science, as do most scientific academies around the world.[3]

Despite the evidence and deepening consensus among scientists, humanity seems to be engaged in a remarkable episode of folly. Folly—pursuing policies injurious to self-interest while being advised against them—is nothing new; it has plagued governments since their incep-

tion.[4] What has changed through the ages is not the lack of wisdom in politics but rather the price to be paid for that lack. Despite a vastly enhanced understanding of our planet's life-support systems, humanity is continually assaulting them—degrading and destroying within a few generations the ecosystems that provide the very basis of civilization. All the world's nations are pursuing this course despite knowledge of its consequences being available and despite the warnings of many of the world's most distinguished scientists. And that folly is being encouraged and promoted by the individuals and organizations whose efforts we refer to collectively as the brownlash. The opinions and doctrines of the brownlash on the state of the environment and related subjects form the focus of chapters 5 through 10 of this book.

Our interest in environmental matters goes back many decades, to even before we met as students at the University of Kansas. As a teenager in New Jersey with a love for nature, Paul had seen butterfly habitat being replaced by housing developments and often found it impossible to raise caterpillars on local plants because of overspraying with pesticides. As an undergraduate at the University of Pennsylvania, he read the now-classic books *Our Plundered Planet* by Fairfield Osborn and *Road to Survival* by William Vogt,[5] which provided a global framework for things he had observed as a young naturalist. Paul's first job as a graduate student at Kansas was studying the evolution of DDT resistance in fruit flies, and the misuse of pesticides was a hot topic among his evolutionist friends. Anne was an art and French major who also was fascinated with nature and science. As a child, she was always more interested in geography, wildflowers, and airplanes than in dolls. She too had read and was influenced by Osborn's book as an undergraduate.

At the time we met, World War II was still the defining event of our lives and a great source of mutual interest. Both of us remember asking our parents whether the newspapers would still be published daily after the war was over; we couldn't imagine there would be enough other news to fill them. We first got together in the student union of the University of Kansas over a bridge game and a discussion of the battle of Dunkirk, which had taken place fourteen years earlier. Dunkirk is a seaport in northern France that in May 1940 was the site of a successful evacuation of the British Expeditionary Force (BEF) after the collapse of the French army. Threatened with annihilation by encroaching German

forces, the BEF evacuation was nothing short of a miracle, accomplished at the last minute by a mixed fleet of naval vessels and small boats.

Our conversation could have been an omen, since the Dunkirk evacuation was a classic result of folly. The British had been thoroughly warned by Winston Churchill and others against appeasing Hitler and neglecting military preparedness. Then, among other things, the French commander in chief of land forces had protested to his superior against a key mistake in French planning—a deployment of substantial forces through Belgium to southern Holland that played a major role in the French army's collapse.[6] The warnings went unheeded, the combined French and British forces were badly beaten, and the British lost almost all their equipment and barely managed to retrieve the vital core of their army—almost a quarter-million professional soldiers. So on first acquaintance, we discussed a folly in which "our" side had barely avoided total catastrophe. Now we're dealing with another case in which the stakes are infinitely higher.

For us personally, discussing Dunkirk was just the start. Keen mutual interests in world affairs, science, and art (among other topics) were soon discovered—and the result was a marriage that has now lasted more than forty years. Both of us had a basic qualification for being scientists: strong curiosity.

In 1955 our daughter, now an economist working for a government agency, was born. By the time she started school, Anne was collaborating in Paul's research, dissecting butterflies under a microscope, illustrating and recording the details of their anatomy for computer studies testing theories of biological classification. Despite the eyestrain from teasing apart and drawing dozens of muscles within structures the size of this "o," she became increasingly interested in science. In the course of a decade of collaboration, we developed a team approach to scientific research and, later, to our work in science policy. Even now, with old age on the horizon, we still have a persistent urge to understand how the world works.

We arrived at Stanford University in 1959 and soon discovered that Paul's senior colleague, the late Richard Holm, shared many of our views. As Paul and Dick started expressing unorthodox views in technical areas of ecology, evolution, and taxonomy,[7] we learned that Dick, too, was deeply concerned about the human impact on the planet. He

was the first of our Stanford colleagues to engage in long discussions with us about the human predicament.

Paul's research in evolution and ecology meant that much of his time had to be spent doing fieldwork—going to many different locations to collect and do field experiments with butterflies or to make detailed observations of reef fishes or birds. In our first sabbatical year (1965–1966), we took a field trip around the world.

The purpose of the trip was to gain a worldwide perspective on the taxonomy, evolution, and ecology of butterflies, the natural system that has been the focus of Paul's scientific career.[8] His work on how the size of butterfly populations is controlled has provided insights into such seemingly diverse issues as why Peruvian anchovetas were being overfished and how to control insect pest populations with minimal use of pesticides. And butterflies were central to research Paul did with our friend, plant evolutionist Peter Raven, who was then also at Stanford. They investigated the interrelationships of butterflies and the plants they eat when they are caterpillars.[9] That study launched the increasingly active field of coevolution, which examines the evolutionary relationships between ecologically intimate organisms such as predators and prey or hosts and parasites.[10] Coevolution explains a great deal about problems now faced by humanity such as the increasingly troublesome resistance of human pathogens to antibiotics and that of insect pests to insecticides.

Going around the world in search of butterflies also gave us a personal view of then little-recognized signs of environmental deterioration. We well remember, for example, landing on Yandina, in the Russell Islands (in the Solomons, just north of Guadalcanal), a tiny spot on the map that we had assumed would be a tropical paradise of birds and butterflies. Instead, we found one large coconut plantation, each tree with a metal rat guard and all the vegetation between the trees cut close to the ground. At Mount Hagen in the New Guinea highlands, we also discovered the forests cleared over a huge area and replaced by dense stands of kunai grass. In both places, the natural flora and fauna were in rapid retreat. We were fortunate that our trip to New Guinea and the Solomons had been arranged by a local entomologist, Joe Szent-Ivany, who was well known for helping visiting scientists. Otherwise we would have been hard-pressed to find relatively undisturbed habitat at

many of our stops in what we had imagined to be an "unspoiled" tropical paradise.

Indeed, during the next summer, everywhere we went in Asia from Malaysia to Kashmir, it was difficult to find places where anything like the original butterfly fauna was present. In Kashmir, the fabled high-altitude meadows of Gulmarg turned out to be biologically barren, grazed to within a fraction of an inch above the ground.

When we returned to Stanford, conversations with Dick, Peter, neurophysiologist Don Kennedy, botanist John Thomas, attorney John Montgomery, and other friends and colleagues focused with increasing intensity on the population-resource-environment situation. These discussions eventually led to Paul's going public in lectures, then in radio and television appearances, and led to the writing of *The Population Bomb*.[11]

But our experiences in field trips around the world ever since have remained much the same. Since the early 1970s, we've watched the forests of Central America disappear, to be largely replaced by degraded pastures. The coral reef in the Grenadines where we did our first research on reef fishes was soon destroyed by ships' anchors. The watershed in Trinidad in which we studied long-lived tropical butterflies was illegally burned to make way for squatters.

Our fieldwork in central Africa was similarly discouraging. When Jane Goodall first arrived at Gombe Stream in Tanzania in 1960, the forest habitat of her treasured chimpanzees stretched continuously for sixty miles east from the shores of Lake Tanganyika. When we went there a decade later to do research on the dynamics of a butterfly mimicry complex, the forest had been cleared to within two miles of the lake.

In the early 1980s, we traveled through Rwanda to the Parc National des Volcans, home of the rare mountain gorilla. The nation presented a classic picture of overpopulation and environmental deterioration: steep hillsides farmed to the tops with little or no erosion control, patches of exotic (non-native) eucalyptus trees being heavily coppiced for firewood, and rivers running red with eroded soil. We were lucky enough to see the gorillas in their shrinking park; a large chunk had already been destroyed for a failed agricultural scheme. Money was not available even to mark the boundary of the remaining park area, and the trees were disappearing one by one along the forest edges to serve for construction and firewood. The loss of the forest had already changed