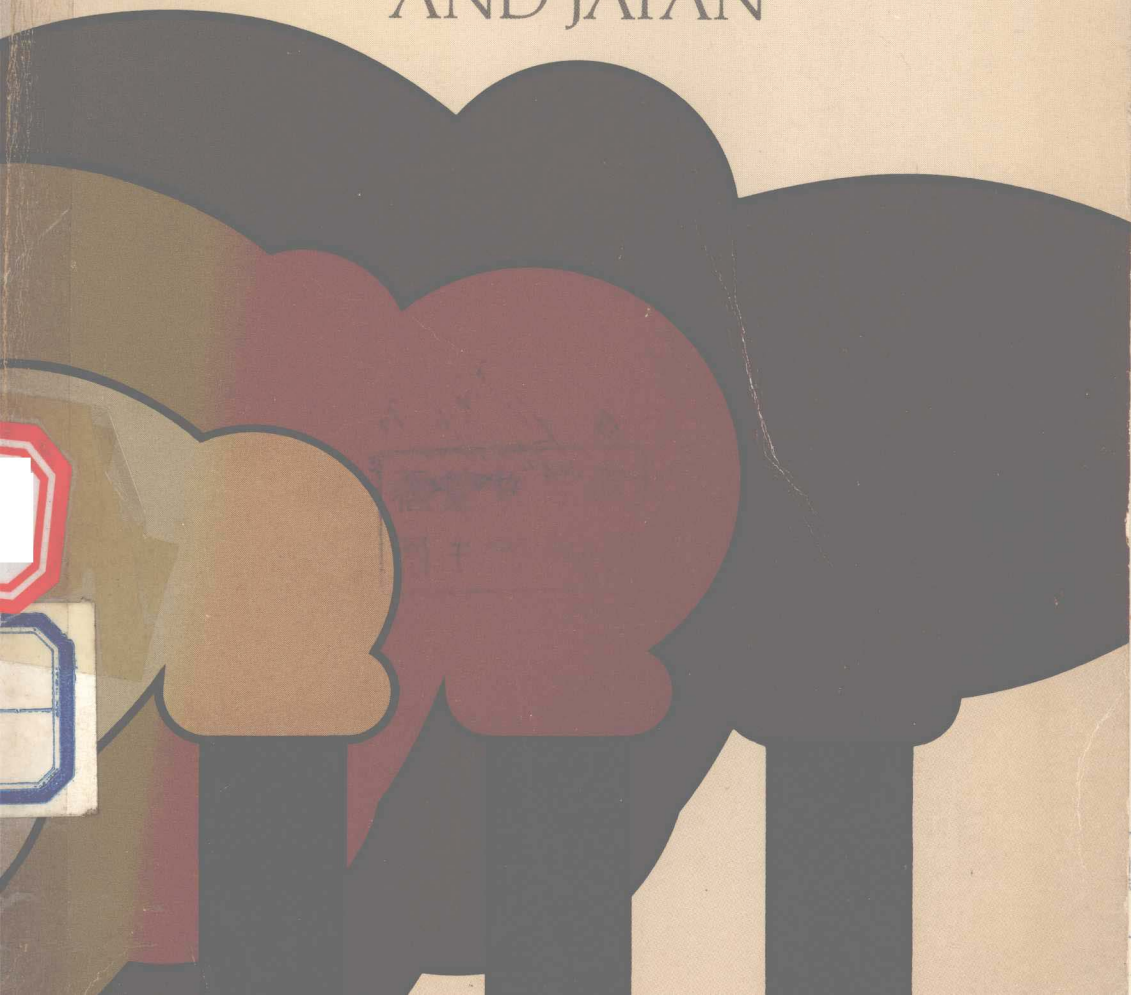
THE ECONOMIC SUPERPOWERS AND THE ENVIRONMENT

THE UNITED STATES, THE SOVIET UNION, AND JAPAN



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W. H. Freeman and Company
SAN FRANCISCO

Library of Congress Cataloging in Publication Data

Kelley, Donald R.
The economic superpowers and the environment.

Bibliography: p.
1. Environmental policy—United States.
2. Environmental policy—Russia.
3. Environmental policy—Japan. I. Stunkel, Kenneth R., joint author. II. Wescott, Richard R., Joint author. III. Title.
HC110.E5K45 363.6 76—1003
ISBN 0-7167-0720-9
ISBN 0-7167-0721-7 pbk.

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Printed in the United States of America

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PREFACE

This book's objectives and limitations are best explained in advance. Rather than have our readers search fruitlessly for what has not been done, we wish for them to know from the outset what we have and have not attempted to accomplish.

Three specific countries have been chosen for analysis. Among the world's nations they are clearly the leading producers, consumers, and polluters. Moreover, their political, economic, and social institutions exhibit important differences. We take it as fact that the nation-state is a basic unit of political organization. For better or worse, national sovereignties constitute the framework within which solutions to the environmental crisis must be found, barring the sudden and improbable emergence of effective world government. Thus we have attempted to provide some insight into the cogency and promise of existing value patterns and institutional structures to halt and reverse environmental deterioration in the United States, the Soviet Union, and Japan, the three indisputable economic giants of the modern world. Their performance and example, we believe, are crucial to the outlook and behavior of other nations, whether developed or developing.

Our unit of analysis, then, is the state and not entire regions. It might be illuminating to do comparative regional studies of Western Europe, East Asia, and Latin America, but we have not chosen that option. Some readers will lament the omission of Western Europe from this study. We can only respond that inclusion of Western Europe would have altered and frustrated our original purpose.

We have aimed not only to elucidate specific environmental problems and policies in the three countries, but to do so in a broad cultural, historical, political, and economic context. Serious engagement with the texture of reality demands wide rather than narrow focus when investigating a phenomenon so complex as the environmental crisis. Our analysis ranges over a spacious field of topics. No doubt all of them could be explored more

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deeply and documented copiously, but a line must be drawn somewhere. Hence the authors bear final responsibility for emphases, choice of topics, and selection of data that might legitimately invite dispute. In many respects the book is a pioneer study, so it goes without saying that in other hands a different study would have emerged.

The reader will note variations in the quantity and quality of data from one country section to the next. Such disparities reflect the uneven quality of sources and available knowledge. With respect to the Soviet Union, an obsession with secrecy has blocked access to certain types of information. Wherever possible the authors have tried to converge in their presentation of evidence, but irregularities are unavoidable. On the other hand, much care has been taken to use the latest factual material. Obviously many topics in this book deal with problems that are dynamic rather than static. Thus in some respects a situation may be getting better than we depict it, while in other instances it may be getting worse. Events tend to run ahead of knowledge in the environmental crisis, but changes are unlikely to be so dramatic in the near future as to invalidate our general observations and conclusions.

This book is not a thoroughly integrated comparative study—an impression that might be suggested falsely by a quick glance at the table of contents. At best it may be described as a quasi-comparative treatment of the three superpowers. A precise characterization might be: three detailed national profiles developed within a common topical framework. The profile of each country could be read separately, but our intention is that all three be studied together, and the book has been organized to facilitate and encourage that end. Readers are urged to make their own comparisons throughout. The authors have reserved the last chapter for their own explicit comparisons.

A word about the authorship of the book's three major divisions: The American part was contributed by Richard Wescott, the Soviet part by Donald Kelley, and the part on Japan by Kenneth Stunkel. The introduction and the conclusion were more or less collective efforts, though Stunkel wrote the former and Kelley the latter.

D. R. K.
K. R. S.
R. R. W.

June 1975

ACKNOWLEDGEMENTS

Many people have been connected directly or indirectly with the completion of this book. The authors extend grateful thanks to all. Some, however, must be singled out for special comment. Paul Ehrlich initially brought the project to the attention of W. H. Freeman and Company. Dennis Pirages, then political science editor, put the book under contract when it was little more than an idea and a prospectus. Subsequently he made valuable suggestions in the early stages of research and writing. Full and useful critiques of the first draft were provided by James Morrison of the University of Florida and Nobutake Ike of Stanford University. Portions of the manuscript benefited from the suggestions of Lester Milbrath and Frederick Inscho.

Donald Kelley profited from the comments of Cynthia Enloe of Clark University and the research assistance of Sally Kelley. He also owes thanks to W. A. D. Jackson and John M. Kramer for their assistance in securing certain materials for the Soviet section.

Kenneth Stunkel is indebted to Kenichi Baba and Kazu Kato of the International Affairs Division, Japan Environment Agency, for providing indispensable materials, arranging numerous interviews, and cooperating with the author in a hundred small ways. Mr. Kato was especially kind to volunteer his services as an interpreter for many interviews. Jun Ui of Tokyo University was both encouraging and a source of valuable information on both pollution and citizen's movements. The library staffs of Princeton University, Michigan State University, the Japan Documentation Center, Columbia University, and the Oriental Division of the Library of Congress were most helpful.

Sally Kelley, Mary Carol Stunkel, and Carol Wescott provided encouragement and assistance throughout the project. Special thanks are due to Sally and Mary Carol for many hours of typing and proofreading.

Kenneth Stunkel and Richard Wescott wish to acknowledge modest financial assistance from the Grant-in-Aid Committee for Creativity, Monmouth College.

CONTENTS

INTRODUCTION

The substance of this study is a comparative analysis of three powerful nations—the United States, the Soviet Union, and Japan—in the context of their interaction with the environment. As leading producers, consumers, and polluters among the world's nations, these superpowers are conspicuous agents of environmental deterioration. How they conduct themselves in the near future is likely to have profound consequences not only for their own citizens but for all of mankind. Their perception of environmental imperatives may well make the difference between a planet with healthy life-support systems and sufficient resources for all and one universally impoverished by a crippled biosphere.*

*The "biosphere" is a tenuous region of the earth capable of generating and sustaining life. It extends roughly from the bottom of the deepest oceanic trench to a few miles above the surface of our planet. The term "ecosphere" suggests much the same life-sustaining film of atmosphere, water, and soil, but it includes the organisms that inhabit it and emphasizes the dependent interrelationships of its components and the physical-chemical-biological cycles by which it is activated and preserved. The ecosphere consists of myriad ecosystems, or local associations of plant and animal life adjusted to particular environmental conditions. An ecosystem is essentially a system for the production, distribution, and utilization of energy. The global ecosphere itself may be regarded as a massive organic mechanism which channels and balances the energy flows of ecosystems.

Although the environmental crisis is the background of this inquiry, it is not part of our objective to demonstrate the existence of such a crisis, or to argue *in extenso* that people and nations must begin to define their relations to the world and to one another in the ecological frame of reference. Those tasks have been accomplished elsewhere with detail, clarity, and force. We take for granted that anyone who wishes to understand the prospects of mankind in the second half of the twentieth century will have to acknowledge ecological imperatives. In this section we shall discuss briefly the main outlines of the environmental crisis. Thereafter we shall be concerned with illuminating the respective roles of three national cultures in that crisis.

The Environmental Crisis

It is now established beyond a reasonable doubt that humans and their activities are disrupting the life-support systems of the planet at a serious rate. Indeed, there is compelling evidence that certain kinds of damage are too well advanced to justify complacency. Troubled scientists have warned that uncritical, unrestrained population growth, massive pollution, and uncontrolled energy consumption could result in calamities on a global scale: disastrous climatic changes, the annihilation of oceanic life, widespread famine and disease, and the breakdown of chemical-biological cycles essential to the maintenance of life itself. Among the experts there is disagreement about the length of time required for present trends to end in catastrophe, but there is little disagreement about the inevitable results. Recently thirty-three distinguished British scientists endorsed "A Blueprint for Survival" which calls for a "steady state" in production, consumption, and human numbers in order to prevent disintegration of the global ecosystem. A now famous computer simulation of what might be the consequences of continued pollution, economic expansion, and population growth *(The Limits to Growth,* [Meadows et al., 1972], researched by an interdisciplinary group at the Massachusetts Institute of Technology) concludes that "the limits of growth on this planet will be reached sometime within the next hundred years." Even if burgeoning populations and pollution were brought under control, according to the study, industrial growth alone would entail self-destruction within a few generations. Richard Falk recently headed the American wing of an international research team whose purpose was to examine mankind's prospects in the balance of this century. His conclusion, in part, states that

> the planet and mankind are in grave danger of irreversible catastrophe. . . . There are four interconnected threats to the planet—wars of mass destruction, overpopulation, pollution, and the depletion of resources. They have

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> a cumulative effect. A problem in one area renders it more difficult to solve the problems in any other area. . . .

Another detailed M.I.T. study, *Man's Impact on the Global Environment* (Wilson and Matthews, 1970), points out that earlier in our history, the prevailing values assigned an overriding priority to the primary effects of applied science and technology: the goods and services produced. The secondary side effects, including pollution, were largely ignored. Paul and Anne Ehrlich, in their comprehensive *Population, Resources, Environment* (1972), chart the growing environmental threat, emphasizing that "the preservation of the diversity of life and the ecological systems of the earth are absolutely essential for the survival of man."

Testimony of this sort could be multiplied indefinitely from respected and scientifically impeccable sources. Prudent people should not discount or ignore these signals of planetary distress just because all the facts are not in (*all* the facts are never in) or because there are disputes among the experts about the severity of the crisis and its precise nature. Belief in the imminent extinction of the human species is not a necessary condition for confessing that dangerous events unprecedented in human history are now occurring on this planet.

Implied in all expressions of concern about biosphere deterioration is the ecological frame of reference. The premises underlying that frame of reference can be summarized briefly. First, all life on earth is a result of evolution. The entire global ecosystem (as well as local systems) has been fashioned and balanced by evolutionary processes in vast periods of geological time. Second, various components of the ecosphere (the atmosphere, water, soil, plant and animal life, as well as human life) are interdependent and sustained in delicate equilibrium. Third, the ecosphere, with its unimaginably complex interrelationships, is finite and susceptible to degradation. When its components and intricate cycles are degraded below a certain level (which knowledge at this stage cannot determine precisely), higher forms of life would no longer be viable, and below a still lower level, all life would perish. Fourth, the ecosphere is unique. No imaginable technology could recreate it in the event of collapse. Cessation of photosynthesis (the basic source of energy for all living things) or of fundamental chemical-biological cycles (carbon, nitrogen, phosphorous) would be irreversible. Consider the analogy of an extinct animal species: once a species has vanished, mankind is not in a position to reconstitute what nature required billenia to produce.

This ecological frame of reference, now invested with dramatic force by the environmental crisis, has added a new dimension to our understanding of our present circumstances and future prospects. Familiar, traditional, and still dominant frames of reference—political, social, economic,

ideological, and religious—by which most human beings orient themselves are not structured to grasp the implications of degraded ecosystems. A shift to the ecological perspective calls for nothing less than a fundamental reorientation of human attitudes and behavior.

The "environmental crisis" itself may be understood as follows:

1. It is global in scope. Industrial and domestic pollutants circulate throughout the atmosphere and hydrosphere of the planet. Some half million substances previously alien to the ecosphere are now discharged into it at the rate of millions of tons a year, and thousands of new chemicals are being devised annually. Toxic heavy metals like mercury are concentrated in oceanic food chains, and pesticides such as DDT are now found in most life forms, including polar bears and penguins in Antarctica. Smog has been detected over desolate stretches of ocean and in the polar regions. Contributors to *Man's Impact on the Global Environment* identify no less than eleven potent sources of global pollution which directly threaten the stability of the ecosphere (they are carbon dioxide, sulfur dioxide, nitrogen oxide, chlorinated hydrocarbon biocides, other hydrocarbons, particulate matter, toxic metals such as lead, mercury, and cadmium, oil, radionuclides, heat, and nutrients). Modern industrial states are extracting fossil fuels from the earth's crust in the billions of tons and releasing wastes resulting from their combustion into the ecosphere. Although the environmental crisis is more intense on the local level, where people are experiencing massive fish kills, dead or dying bodies of water, unhealthy air, declining soil fertility, and the like, it is the emergence of global symptoms, however imponderable at the moment, which should give pause to reasonable persons.

2. Interferences with environmental balance on a global scale by a single species has no precedent in the history of the planet. Those who dismiss ecologists as apocalyptists in modern dress fail to understand that very little in our previous experience has prepared us to recognize or deal with deterioration of the global ecosphere. Physical, chemical, and biological processes that make the earth hospitable to life evolved and matured long before the emergence of *Homo sapiens*. During virtually all of mankind's relatively short history, the environment and its elaborate processes have been taken for granted without being comprehended. Human works and thoughts have proliferated largely outside of and prior to the ecological frame of reference. In the past there have been crises of disease, famine, war, social revolution, and rapid cultural change; civilizations and peoples have risen and fallen. Never, however, has there been a crisis of the global environment. Present difficulties are a direct result of human history. In the long perspective of his evolution as a culture-bearing animal with special endowments, man has drifted across the millennia on a collision course with

nature. In the past six hundred thousand to one million years human beings were never sufficiently numerous nor possessed of enough power to undermine the ecosphere. Ecological ignorance, insensitivity, and destructiveness were manifested on the local level, although the perimeter of "local" impact has expanded steadily with the march of centuries. As hunters and gatherers numbering less than five million persons in 10,000 B.C., we seem to have pursued many animal species to extinction. As agriculturists numbering more than a billion by 1850, we decimated forests, eroded soil, created deserts, fouled local waters, and continued to press on surrounding animal life. As producers and consumers of industrial goods, and as users of new energy sources, numbering four billion in 1974, we have entered a radical new phase of our discordant relationship with nature, one in which we have all the means necessary to undo the environment on a global scale. A multitude of severe local disruptions are running together to threaten one universal disruption. Thus the "crisis" of the environment in the second half of the twentieth century is utterly *sui generis.*

3. The range and intensity of environmental problems appear to be expanding in ever smaller increments of time. Human numbers have increased from five hundred million in 1650 A.D. to four billion in 1974, doubling three times in a bit more than three hundred years, where better than six hundred thousand years were required to bring world population to the 1650 mark of five hundred million. The present population of the globe is expected to double again in a mere thirty-five years to more than seven billion, and reach fourteen billion by the year 2014, barring a population "crash" due to famine and disease or stringent population controls. The consumption of nonrenewable resources is increasing at an exponential rate. It is likely that in fifty years the level of industrial output throughout the world will have grown by a factor of five, again assuming that resources and energy hold out.* This enormous expansion of population and economic activity in so short a time can be expected to impose a staggering burden on the ecosphere solely as a result of energy consumption and the generation of pollutants.† In addition, there will be heavier pressure on the land to augment food production, more insistent exploitation of forests, fisheries, and mineral resources, less opportunity for other forms of life to exist unmolested, and heightened chances of significant imbalances in the chemical-biological cycles of nature.

*Where certain resources are plentiful, the question is whether there will be time, will, and investment capital to make them available. Demand is far ahead of supply (in the sense of what is available for use) and is likely to stay that way without restraints in population growth and consumption.

†Those who exult in the prospect of exploiting still vast reserves of fossil fuels in the earth's crust seldom ponder the consequences of releasing such a vast amount of waste and heat into the ecosphere in a brief period of time.

4. The causes of the crisis are complex, therefore the solutions are also likely to be complex. Societies and governments have devoted comparatively little money or time to the understanding of environmental problems. Knowledge is full enough to assert that a crisis exists, and to predict the consequences which probably will ensue should present trends continue unabated. But knowledge is not adequate to pin down explicitly how grave present conditions are, or to say precisely when a point of no return will be reached in a given sector of the environment, for example, the collapse of oceanic food chains as a result of pesticide impact on photosynthesis in phytoplankton, or rapid climatic changes as a result of rising carbon dioxide and particulate levels in the atmosphere. Amassing such knowledge in a reasonable period of time will not be easy, even if financial and political support are forthcoming. Moreover, the nonscientist has difficulty coming to terms with what is already known in the environmental field. Instead of a set of discrete events which can be isolated from one another and manipulated individually, the citizen, politician, business man, or bureaucrat finds himself confronted with a dynamic system of interrelated events constantly shifting from one moment to the next. René Dubos has said, "all environmental problems are so tangled and at the same time so diffused that they cannot be effectively dealt with by the linear methods of the prestigious hard sciences." In general, the previous experience and interests of people have not prepared them to cope with an organic, systems approach to nature in which everything must be perceived as being related to everything else.

5. Closely associated with all of these problems is a negative time factor. The longer proposed solutions are delayed, the more difficult they become. Both the magnitude of the problems themselves and the social costs involved in solving them seem to grow exponentially as time passes. Added to this dilemma is the lack of certainty as to when critical points of no return will be reached. We admit that fragile ecosystems can be pressed only to finite limits before damage becomes irreversible, but in reality we have little indication of when the point of imminent collapse will be reached.

Without further elaboration, the foregoing comprises our provisional understanding of the environmental crisis, which becomes intelligible only when discussed within the ecological frame of reference. That frame of reference points to biological realities of a finite, vulnerable, irreplaceable ecosphere whose equilibrium cannot be unbalanced with impunity, and informs us that rational management of the earth's resources must be guided by a sense of limits. In the wake of uncontrolled consumption and waste, individuals, societies, and nations cannot expect nature to make all the adjustments. It remains to be said that few persons on the planet compre-

hend or accept the ecological frame of reference. Pollution is viewed frequently as a mere inconvenience which one may or may not wish to tolerate. It is thought to be a matter of individual taste and values and not of survival. Only a handful of human beings see their needs, demands, and activities in the context of balanced life-support systems. Most people continue to look upon the earth and its resources as a bounty to be exploited without end, and upon man as an invincible solitary phenomenon standing apart from nature and its laws.

An ecological perspective on man's place in nature has yet to be given precedence over the special interests of political, social, and religious factions. In recent global conferences on population, food, and a law of the sea, relevant problems were largely ignored as various national groups squabbled and maneuvered in narrow, self-defeating gambits to achieve small political and ideological advantages. At the very moment in history when all the world's people are growing profoundly interdependent and require among themselves the closest cooperation, national sovereignties are multiplying and have congealed into hostile blocs.

When one is caught up in the ecological frame of reference, however, traditional problems and concerns are seen in a new light and take on fresh dimensions. As Robert Heilbroner (a rare economist who has begun to think ecologically) has remarked, "who cares, in the perspective of ultimate environmental safety, if institutions of present-day capitalism and socialism disappear?" The conventional preoccupations of economists may seem anachronistic. Elaborate analyses of how existing economic systems function, of interest rates, market conditions, and fluctuations of gross national product may suggest a farmer counting chickens in a henhouse about to burn down. Economists on the whole have not heeded Barry Commoner's admonition in *The Closing Circle* (1971): "the lesson of the environmental crisis is . . . [that] if we are to continue to survive, ecological considerations must guide economic ones." With a few notable exceptions, the most distinguished economists have not attempted to formulate economic practices and institutions that might harmonize with the environment. In the political arena it is doubtful whether the security of nations and the well-being of peoples can be assured solely through diplomatic maneuvering and balance-of-power strategies without national and international institutions designed to preserve a healthy ecosphere. Deterioration of the environment may well constitute the gravest danger to "national security" in this century. By failing to shift priorities in time, and by neglecting to alert their peoples to the need for ecologically responsible behavior, the world's statesmen are open to the charge of destructive negligence. Governments are not prepared to admit that ecological considerations must guide political ones. Yet one can question the sanctity of national sovereignty

solely on the ground that nations cannot keep their pollution to themselves. The ecosphere is bigger and more important than any nation. The destruction of animal species, the poisoning of air and water on a sizable scale, and the obliteration of unique ecosystems are dangerous acts which transcend the mere internal affairs of a state.

The ecological frame of reference also cuts down to proper size the power and promise of technology. Widely viewed as a form of secular magic whose proven virtuosity can solve any problem, technology is the perpetual trump card of the optimists. But technology is a significant cause of the environmental crisis, and it is unrealistic to suppose that technology alone can heal its own ravages and reverse undesirable environmental trends. No imaginable technology can restore an extinct species, purify contaminated food chains, or create *de novo* the fundamental chemical-biological cycles of nature. Uncritical faith in anticipated or unknown technological solutions to environmental problems is a naive form of dependence on a single escape route. Moreover, piecemeal reliance on technology is just the opposite of the systems approach to nature in which everything must be seen as related to everything else. Too often the appeal to technological solutions is a substitute for individual prudence and national self-restraint. The secret hope is that people and nations will not be obliged to make sacrifices and that science will take up the slack, providing easy, mechanical answers to problems which are rooted in unwise, prodigal human behavior. The overriding problems of the modern world are human, not scientific. Although technology offers much in the way of immediate help, it is foolish to expect miracles if human societies cannot muster the will to accept the most elementary steps toward self-discipline and self-preservation. Technical solutions to many of the globe's problems exist but cannot be implemented without a willingness to invest money and brainpower, to take into account the environmental impact of technology, and to alter sociopolitical-religious patterns standing in the way of implementing those solutions. The implication is that disaster can overtake nations and peoples in the midst of highly sophisticated knowledge and technical power. The latter are useless without the will to use them.

Economic Superpowers and the Environment

The dominant form of political order on this planet is the nation-state system. That system, as well as the values, commitments, and attitudes associated with it, is *pre-ecological,* which is to say it came into existence to deal with needs and problems largely unrelated to the preservation of a stable ecosphere. It is by no means obvious that the environmental crisis can be resolved satisfactorily by a swarm of sovereign states in active

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