

Part I

Traditional Positions

CHAPTER ONE

PHILOSOPHICAL

ATTITUDES

Eugene C. Hargrove, FOUNDATIONS OF ENVIRONMENTAL ETHICS, Chapter One, "Philosophical Attitudes," pp.14-47 (Englewood Cliffs, NJ: Prentice Hall, 1989).



In his famous essay "The Land Ethic," Aldo Leopold states his conviction that environmental problems are ultimately philosophical in nature and require a philosophical solution before there can be much hope of environmental reform. Although he is aware that philosophers have taken little or no interest in the environment, Leopold does not blame them for their inactivity but rather faults contemporary environmentalists, who, he says, have failed to make conservation something worthy of philosophical attention. He writes:

No important change in ethics was ever accomplished without an internal change in our intellectual emphasis, loyalties, affections, and convictions. The proof that conservation has not yet touched these foundations of conduct lies in the fact that philosophy and religion have not yet heard of it. In our attempt to make conservation easy, we have made it trivial.¹

While this general criticism of twentieth-century environmentalists and their methods may be deserved, it is an exaggeration to claim that they had anything to do with Western philosophy's insensitivity and lack of interest in environmental issues. Actually, the ideas and attitudes that have

kept philosophy and religion from paying attention to the environmental movement have been part of Western civilization and thought for thousands of years and transcend all recent environmentalist activity. The simple truth is that philosophy in particular has always been either irrelevant or incompatible with environmental thinking since Western man first began philosophizing almost three thousand years ago.

It is, however, perhaps a little harsh to *blame* philosophy and philosophers for the modern environmental crisis, since we normally assess blame for doing something wrong when it is possible to determine that it could and *should have been done in another way*. Philosophers living hundreds and even thousands of years ago can hardly have been expected to have foreseen our present troubles, which in large measure stem from the presence on the Earth of enormous numbers of people—numbers inconceivable in earlier times. Yet philosophy, which is the primary source of most Western ideas, is in some *less passionate and morally reprehensible sense responsible* for the ideas and attitudes that inhibit environmental protection today, and a *close look at the origins and history of Western philosophy* can help clarify these matters even though it may not resolve them.

Religion, in contrast, though often criticized by environmentalists as the chief culprit, *has played a much less fundamental role*. Most of the environmentally offensive ideas in Western religion originated *not in religion but in Western philosophy*. It could easily be argued that religion, by continually borrowing from philosophy, was itself victimized by it. Charges that religion is responsible for our environmental problems usually depend on special interpretations of early passages of *Genesis* involving the claim that God intended man to have dominion over the Earth.² It can be argued that *Genesis* caused human beings to begin *the transformation of nature* that has continued to the present day with disastrous consequences. The weakness of this accusation is, as John Passmore has noted, that *Genesis* was written long after this transformation began and thus could hardly be the initial cause.³ At most *Genesis* merely states a view of *man's relationship to nature* that was commonly accepted at the time the book was written and probably predated the Old Testament by many thousands of years.

It can still be argued, however, as Passmore suggests, that *Genesis* was intended as a *justification for the human modification of the Earth and as such was an attempt by man to "salve his conscience."*⁴ While this interpretation may place religion at the center of an almost prehistoric guilt-ridden debate over human impact on the environment, it too is difficult to defend. It is hard to imagine that human beings at the dawn of civilization could have perceived *the damaging influence of their actions* so clearly when their descendants have only begun to achieve a dim understanding of the relationships involved in the past hundred years. It is probably more reasonable to speculate that early humans were more concerned with *salvaging their fear of nature* than their guilt and that *Genesis* served less as a

justification of environmentally offensive actions than as a comfort and hope for people unsure of their place in the natural world and therefore preoccupied with survival.

Most likely Genesis did not become environmentally troublesome until the late Middle Ages, when church philosophers interpreted it in accordance with the writings of Aristotle, a newly rediscovered Greek philosopher who thought that the purpose of the world was the service of man.⁵ Later it also became entangled in political philosophy, for example, when it was used by John Locke, an English philosopher of the seventeenth century, to help justify his theory of property—a theory that was to have important influence on environmental debates in nineteenth-century America.⁶ The association of these philosophical ideas with the passages in Genesis transformed them into primarily philosophical rather than religious doctrines.

Two periods in the history of philosophy have been most instrumental in shaping philosophical attitudes toward the environment: classical Greek philosophy and early modern European philosophy. Although they are closely related, they need to be dealt with separately.

GREEK PHILOSOPHY

Greek philosophy is normally divided into two parts: the two hundred-year period before Socrates and all subsequent philosophy after Socrates until the Roman conquest. Its high point came at the beginning of the second period with the work of Plato and Aristotle. Although these two men have probably had a greater impact on Western thought than all other philosophers combined, they were working within an established philosophical tradition that had in large measure already determined the general direction of Western philosophy. Thus the pre-Socratic period needs to be examined first before turning to them.

Basic Presuppositions

Pre-Socratic philosophy was almost exclusively concerned with speculation about the natural world. Some attention was focused on biological matters, rather amazingly with results that anticipated the theory of evolution. Anaximander, one of the earliest known philosophers, for example, claimed that man came from a fish.⁷ About a century later, Empedocles proposed an evolutionary theory anticipating the “survival of the fittest” doctrine.⁸ These ideas, however, though interesting, did not find a permanent place in Western thought and apparently had no influence on nineteenth-century evolutionary biologists. Much more important historically were early Greek speculations about the nature of matter and its interac-

tions with mind. The latter remains one of the major unresolved problems still confronting philosophers today. The former was an essential ingredient in the development of natural science. However silly and simplistic the actual ideas offered by these early philosophers may seem by modern scientific standards, they served admirably as preliminary studies that helped make possible physics as we know it today.

The first philosopher of whom we have any record was Thales, born in Miletus in 640 B.C. His most spectacular accomplishment was the predication of a solar eclipse in 585 B.C. Unfortunately, none of his writings have survived, and his views are known only from criticism of his ideas found in the writings of later philosophers. Only three statements have been directly attributed to him: (1) The first principle of all things is water, (2) the lodestone has a soul because it draws iron, and (3) all things are full of gods.⁹ Admittedly, these remarks do not provide us with enough information to determine what Thales' philosophical views were as a whole, but they do shed some light on the kinds of problems and questions that Thales was concerned with and the assumptions he made about the natural world.

Judging by these fragments, Thales was primarily interested in the nature of the physical world and its interrelationships with mind. He conceived of the world in material or physical terms and was fundamentally committed to the idea that objects encountered in the world were made out of some kind of material substance or matter. One of the problems that he set for himself was the identification of this underlying substance. When Thales said that the first principle was water, he was hypothesizing that water was the substance out of which all physical objects were formed. In addition, he was curious about how the soul or mind influenced physical objects. According to Aristotle, Thales believed that mind was the source of motion and could move objects. In this sense, the ability of the lodestone or magnet to move iron was supposed to be an indication that it might have a soul. Thales' statement that all things were full of gods, Aristotle adds, might mean that mind or soul is distributed throughout the world and intermingled with it.¹⁰

The concept of matter in Thales' philosophy, whether it originated with him or not, has been one of the most influential contributions of Greek thought to Western philosophy. Although no one accepted Thales' conclusion that water was the ultimate substance, everyone agreed that there was an underlying substance of some kind, and each major philosopher after Thales offered his own speculations about what it might be. Anaximander, a contemporary of Thales' in Miletus, called it the "infinite." Anaximenes said it was air. Pythagoras, enraptured with mathematics, said that it was "number." Heraclitus suggested fire, and Xenophanes, earth. Empedocles proposed four elements: earth, air, fire, and water. According to Anaxagoras, it was an infinity of infinitely divisible "seeds". Democritus, going one step further, claimed that it was an infinity of atoms, which were

not themselves further divisible. Despite occasional lapses of interest, the physical composition of the world has continued to fascinate and puzzle Western philosophers and scientists ever since. Atoms, electrons, protons, neutrons, and now quarks are only the most recent answers to the problem Thales raised nearly 2500 years ago.

Equally important to the future of Western philosophy and science, however, were three other assumptions implicit in Thales' philosophy: (1) that the world has a rational structure, (2) that this structure is knowable, and (3) that it is relatively simple and easy to understand. Thales believed that the world was organized in an orderly manner and that the principles describing or governing this order were true in all parts of the universe. Furthermore, he was convinced that these principles could be discovered and comprehended through the use of reason. In other words, man, by engaging in rational activity, could uncover the secrets of a rational world. Finally, Thales undertook his investigations with an almost arrogant optimism. He did not humbly set out to learn something about the workings of nature but rather immediately sought the *first* principle upon which all the rest of the structure or order depended, confident that everything else would fall into place once it was found.

Although pre-Socratic philosophers after Thales did not challenge any of his basic assumptions, they did consider his characterization of matter naive. Subsequent work in philosophy during this period thus focused on efforts to develop a fuller account of the nature of matter. According to Anaximander, it was foolish to suppose that the ultimate substance was one of the more obvious elements—earth, air, fire, or water—for none of these was very fundamental since one could be observed turning into another.¹¹ The true underlying substance, he argued, had to be something that was not itself encountered in ordinary experience. While all this may seem little more than common sense to people in the twentieth century who are used to the idea that physical objects, such as tables and chairs, are made out of atoms, it was this aspect of Anaximander's philosophy that provided the foundation for the type of scientific inquiry that would centuries later produce modern physics and chemistry. Anaximander's position, moreover, although critical of Thales' theory of matter, was nevertheless supportive of his basic assumptions about the nature of scientific inquiry. The idea that the underlying substance was not identifiable in the world as we perceive it through the senses further encouraged the pre-Socratics to seek knowledge through reason alone and disregard sensation. This assumption was challenged only once many years later, when Anaxagoras proposed that matter was composed of "seeds", tiny replicas of observable objects, which would therefore have sensible properties, though too small to be seen. Ultimately it proved very useful, with the emergence of modern physics at the end of the Middle Ages, specifically, in the context originally intended by Anaximander, the investigation of physical matter.

The Problem of Change

Most of the pre-Socratic period was devoted to a debate about the nature of **motion and change**, and it is in terms of this controversy that the Western conception of matter achieved its final form. Although one pre-Socratic, Heraclitus, tried to base his philosophy on **change**, stating at the outset that the world was in flux, most philosophers of the time were profoundly **troubled by change**, for it seemed to them to be logically impossible for change to take place at all. They reasoned that for something to change, it was necessary at some moment in time for the object that was changing to stop being what it was and start being something else. Since time was held to be infinitely divisible, this meant that at some tiny moment of time the object would no longer be what it had been and still not yet be what it would soon be, and at that moment it would be nothing at all. This argument reinforced the **Greek suspicion that material objects as encountered in experience through the senses were illusory and nonexistent**, and it led them to a conception of matter that was permanent and unchanging.

The arguments against change culminated in the philosophy of Parmenides, who believed that something could not come from nothing and that what existed could not cease to exist. **What is, is, he declared; what is not, is not; what is, cannot not be; and what is not, cannot be.** Since the world of **change violated these principles**, he concluded that it could not exist and must therefore be an illusion. What really existed, Parmenides claimed, must be "without beginning, indestructable, entire, single, unshakable, endless." He called this the **"One,"** arguing that the **idea of a world of many objects was just one more illusion.** This position not only denied the existence of the world but also set strict limits on language and thought. The object of thought and language must physically exist, Parmenides argued, and since the One was the only existent object, only one sentence was possible: "Being is." All other thoughts and statements were nonsense because they referred to things that did not exist. To say, for instance, that an object was red was ridiculous, since the statement "This object is red" for Parmenides also asserted that it was *not* blue, *not* brown, and so on, all assertions of nonbeing or nonexistence.¹²

Strange though these arguments may sound to modern ears, they were taken very seriously by Greek philosophers and were strongly defended by Parmenides' supporters, particularly **Zeno** and Melissus of Samos. Zeno is well known for his many interesting paradoxes about arrows that cannot move in flight and slow-moving tortoises that cannot be overtaken by the fastest runner, all designed to illustrate the logical absurdity of more conventional views of the world and the consequent necessity of accepting Parmenides' philosophy of the One. Although Greek philosophers eventually rejected Parmenides' philosophy, they adopted his **general conception of matter as eternal, unchanging, permanent, indivisi-**

ble, indestructable, and immovable. By way of the Greek and Roman atomists, Parmenides' monism was converted into a pluralism of atoms, in which change was explained in terms of the rearrangement of atoms, and was in this form adopted by modern physics. Not only did the original atom of physics conform to Parmenidian specifications as an indivisible, unchanging, and indestructable entity, but so has every new subatomic entity that has ever been proclaimed the ultimate building block of the universe.

The most immediate effect of Parmenides' philosophy, however, had nothing to do with the atomic theory. In denying the possibility of language and thought, Parmenides was also denying the very possibility of epistemology, metaphysics, and science. Had his conclusions been allowed to stand in full, it would have meant the end of philosophical and scientific speculation, with devastating impact on the course of Western civilization.

Plato and Aristotle

Although the philosophies of Plato and Aristotle are much richer and more diverse than any of the pre-Socratics, they may for our purposes here be treated primarily as answers to Parmenides. Plato accepted Parmenides' claims that real entities must be eternal, permanent, immovable, indestructable, and so on, but he argued that epistemology and metaphysics were not impossible. According to Plato, the universality of concepts suggested that there were "forms" or "ideas" that governed our perception of the world and our thought. These forms did not exist in the world of experience but were outside of it and could be reached or perceived only through the use of reason. The world of the senses was to the world of the forms what in turn shadows were to it. The relationship of the conceptual and physical worlds was one of "participation." We know and understand a concept like equality, Plato claimed, by seeing the participation of objects in the natural world in this concept. Of course, no two objects are exactly equal, but they suggest the idea of equality to us. Geometric objects are suggested to us in the same way, as, for instance, when triangular objects participate in triangularity. Similarly, physical objects, such as trees, participate in the form of tree, and human beings participate in the form of man.

Metaphysically, this theory was rather disappointing. Although the mental realm of the forms, since it was unchanging and indestructable, was fully real or existent, Plato, like Parmenides, conceded that the world of experience did not really exist, since change and becoming necessitated moments of nonexistence; nevertheless, he did make some improvement even here by allowing limited reality to physical objects to the extent that they participated in the forms. In epistemology, however, Plato managed a major breakthrough by providing an adequate basis for knowledge and rational thought while still working within the framework of Parmenides' fundamental assumptions. By claiming that all the forms were logically connected to all the others—and as a group subsumed under the ultimate

form, the Beautiful and the Good—Plato was able to meet the Parmenidian requirement for unity, which, taken together with the permanence and indestructability of the forms, saved knowledge, thought, and language from Parmenides' arguments. As such, it represented an epistemological solution to the problem of change.

The metaphysical solution, in turn, was achieved by Aristotle. Rejecting Plato's two-world concept of reality, Aristotle brought the forms down into the natural world, where he joined them with matter forming natural objects, which were combinations of matter and form. Form existed in these objects in a double sense—potentially and actually. The actual form was the set of properties exhibited by an object at a given moment. Potential forms latent in the matter of the object were forms that could be actualized in the future. On one level, change was characterized as the actualization of these potential properties. On another level, it was also characterized as a superficial movement and rearrangement of matter in space. By arguing that matter and form did not themselves change at either level, Aristotle succeeded in producing a credible explanation of change that did not violate Parmenides' arguments that absolute change was impossible.

Aristotle's solution to the problem of change brought to a close a very fruitful period on epistemological and metaphysical speculation. As should be obvious, this period prepared the way for the emergence of modern science in the seventeenth century. What may be less obvious, however, is that it also prepared the way for attitudes toward nature that are very much incompatible with modern environmental thinking. It is to these matters that we now turn.

GREEK INFLUENCE ON ENVIRONMENTAL THINKING

Using the preceding sketch as a guide, I shall now argue that Greek philosophers approached natural phenomena in a way that (1) prevented the development of an ecological perspective, (2) discouraged the aesthetic appreciation of the natural world, and (3) promoted a conception of reality that made the idea of nature preservation conceptually difficult, if not impossible.

The Ecological Perspective

Because of the general direction that Greek philosophy took from its very beginnings, in Asia Minor, it was virtually impossible for Greek philosophers to think ecologically in any systematic way. To begin with, the Greeks would not have considered an understanding of ecological relationships in nature to be knowledge. Objects of knowledge, like the ultimate objects of reality, were believed to be permanent, eternal, and

unchanging. Ecological relationships, in contrast, are concerned with objects that are impermanent, perishable, and in a constant state of change. By Greek standards, therefore, an understanding of such objects could at best be good opinion, not knowledge, and could have no place of importance in the quest for the ultimate principles governing the nature of existence.

Similarly, the belief that the world has a rational structure also pointed the Greeks away from an ecological awareness of the world by discouraging firsthand observation. Wary of information gathered by the senses, the Greeks sought first principles from which they could deduce all other knowledge by reason. Because sensory data was considered a hindrance to the exercise of reason, it was seldom the starting point for metaphysical speculation and almost never used as a check on the validity of conclusions drawn by logical inference. In the *Phaedo*, for example, Socrates is portrayed as eagerly awaiting his own death so that he may at last employ his powers of reason free from the annoyances and distortions of the world of the senses.¹³ This preference and reliance on reason and disdain and disregard for the senses made it unlikely that the results of philosophical reasoning would bear much similarity to actual ecological relationships and processes in the natural world.

A good example of the inhibiting effects of this rational approach to nature is found in the Greek conceptions of earth, air, fire, and water—all of great importance in modern ecological science. Since the Greeks frequently spoke of these phenomena and made some attempt to investigate their interrelationships, one might expect that they would have discovered a few ecological principles and relationships and developed a rudimentary ecological perspective. Greek philosophers, however, were not really interested in these phenomena as phenomena but only as stand-ins for ultimate substances or elements, and since matter was supposed to be something outside of immediate experience, its study was always suspect. In other words, study of the physical elements merely as encountered in nature and perceived through the senses was considered superficial, peripheral, and inconsequential, of no philosophical significance.

Equally damaging was the belief that change was impossible and therefore illusory. Because earth, air, fire, and water, the elements that were supposed to make up the world as we encountered it, were the phenomena most often observed in association with change, the logical implication was that they, like the rest of the world, were not real either. Interest in these elements persisted, but they were commonly viewed as superfluous sensory phenomena that veiled reality and did not partake of it in any significant degree. Aristotle's separation of metaphysics and physics permitted their reintroduction as subjects worthy of investigation, but even then they remained makeshift elements to be discarded when more suitable elements could be found. With the rise of modern science at the end of

the Middle Ages, they dropped out of physics altogether to become part of astrology and alchemy. When scientific method was at last applied to these elements, the result was chemistry, not ecology.

Compare, for example, the Greek philosophical conception of fire with its counterpart in ecology in the twentieth century. Ecologists today find the study of fire in nature to be a complex and fascinating subject. They sometimes see it as part of an ecological cycle in which forest periodically becomes open grassland, allowing the reintroduction for a time of various animals that need specific habitats represented by distinct stages in the conversion of the grassland back into forest. Other times they see it as an instrument of the status quo, keeping adjacent forested areas from overrunning steppes and prairie. On still other occasions they even see it as a necessary step in the reproduction of plants, for example, sequoia saplings in the western United States that only grow on ground that has first been cleared by fire. Although in principle the Greeks could have drawn similar conclusions, their general philosophical orientation made such discoveries virtually impossible. When a Greek philosopher looked at fire in nature, it raised questions in his mind about the physical and chemical principles governing combustion, not about the effect of the fire on the natural history of the area.

Still another obstacle to the growth of an ecological point of view was the assumption that the rational structure of the world is simple. The complexity of the world did not fascinate the Greeks as it does us today; rather it bewildered and frustrated them, seemingly denying them the access to the first principles of nature that they so fervently desired to possess. The simplicity assumption encouraged the Greeks to ignore complex relationships in favor of simpler ones and contributed to the development of a method of investigation, the reductionist method, that concentrated on parts in isolation from the complex whole. This method was based on the idea that complex interactions and relationships could be broken down into a series of simple ones. Although this approach was undoubtedly essential to the development of the scientific method and the discoveries of physics and chemistry, it was not true of the world as a whole and unsuitable for ecological investigation, since, as we know today, most ecological interactions and relationships are too complex to be studied in isolation as simple and independent parts.

To a very large degree, even the kinds of relationships that the Greeks were looking for in their search for rational structure were inappropriate for the development of an ecological perspective. Because the Greek method of inquiry involved a step-by-step deductive procedure, philosophers tended to seek out and focus on relationships that were necessary and universal—that is, relationships that cannot be otherwise than they are and that are true in all times and places.¹⁴ These can be dealt with very easily in deductive arguments because they are always true regardless

of the circumstances. Most ecological relationships, however, are not of this kind. They are the product of a **specific evolutionary history** that could have happened in many other ways and are thus contingent or accidental, dependent on the circumstances in particular states of affairs. Such relationships cannot be discovered by the use of reason alone; extensive and painstaking observation and experimentation are required, approaches that the Greeks viewed with suspicion. Moreover, the large number of possibilities involved in such relationships limits their usefulness in deductive arguments. Knowledge of the existence of the panda, for example, cannot be deduced from knowledge of bamboo, or vice versa. Nor does knowledge of the dietary dependency of the panda on bamboo provide us with enough information to deduce the specific properties or characteristics of either organism. All kinds of animals could have developed a dependency on bamboo, and if bamboo had never existed, the ancestor of the panda could have turned to some other plant. If the Greeks had stumbled across ecological relationships of this kind, they probably would have discarded them as **marginally interesting but useless bits of opinion** and returned to their search for necessary and universal relationships more in tune with their deductive approach.

Of all the major Greek philosophers, **Aristotle was the only one who came close to approaching nature from an ecological perspective.** Although he never abandoned his metaphysical interests, he argued forcefully in *De Partibus Animalium* that the study of ultimate substances in the pre-Socratic manner had to be supplemented by the investigation of natural objects, plants, and animals as they are encountered in nature:

But if men and their several parts are natural phenomena, then the natural philosopher must take into consideration not merely the ultimate substances of which they are made, but also flesh, bone, blood, and all other homogeneous parts; not only these, but also the heterogeneous parts, such as face, hand, foot; and must examine how each of these come to be what it is, and in virtue of what force.¹⁵

This shift of focus permitted Aristotle to make the transition from pure metaphysical speculation to pioneer work in biology and botany.

In addition, Aristotle developed an interest in geology and in this connection made observations that indicated that he was very much aware of environmental change. In the *Meteorology*, for example, he notes that the plain of Egypt was formed by deposits of silt left by the Nile, and generalizing on such observations, he concludes that from time to time major changes have taken place both locally and over vast regions of the Earth's surface. Many of these changes have gone unnoticed, he writes, because they have occurred over immense periods of time, sometimes longer than the histories of particular peoples or civilizations.¹⁶

Despite his recognition that environmental changes occurred frequently, however, Aristotle does not seem to have developed any interest in nature protection. On one occasion, for instance, Aristotle mentions that the Egyptians abandoned work on a canal linking the Nile and Red Sea when engineers determined that the Red Sea was higher than the Nile valley and might therefore flood the valley with salt water, spoiling the river and the land.¹⁷ This example could have given Aristotle an excellent opportunity to say something about environmental protection, but instead he presents it merely as evidence in favor of his general views on changes in coastlines.

Although Aristotle's attitudes toward the environment, like those of other Greek philosophers, were undoubtedly shaped most fundamentally by his general metaphysical perspective, his belief in purposes or final causes in nature probably also played an important role. Noting that change in nature, particularly biological and botanical nature, usually occurred in specific ways involving specific stages, Aristotle concluded that certain kinds of objects, especially living organisms, existed for particular purposes as part of a design built into nature. The purpose or final cause of the existence of an acorn, for example, is an oak tree. Generalizing still further, he concluded that lower organisms existed for the benefit of higher organisms, and they all could be ranked into an order of being, with humans at the top. As he puts it in his *Politics*, in a section on property:

Property, in the sense of bare livelihood, seems to be given by nature herself to all, both when they are first born, and when they are grown up. For some animals bring forth, together with their offspring, so much food as will last until they are able to supply themselves; of this the vermiparous or oviparous animals are an instance; and the viviparous animals have up to a certain supply of food for their young in themselves, which is called milk. In like manner we may infer that, after the birth of animals, plants exist for their sake, and that other animals exist for the sake of man, the tame for use and food, the wild, if not all, at least the greater part of them, for food, and for the provision of clothing and various instruments. Now if nature makes nothing incomplete, and nothing in vain, the inference must be that she has made all animals for the sake of man.¹⁸

Since the entire hierarchy exists, in this view, for the benefit of humans and this order is itself supposed to be permanent and unchanging, there is little need for environmental concern. Although, as Aristotle was quite aware, individual organisms frequently fall victim to mishaps that prevent them from fulfilling their purposes, enough could be expected to survive that humans at the top of the pyramid would not be unduly inconvenienced.

To have achieved an ecological perspective that could generate environmental concern, Aristotle probably needed, as a minimum, to abandon this belief in set purposes in nature. As J. Donald Hughes has pointed out, Theophrastus, a student of Aristotle's, did in fact develop a significant

understanding of many ecological relationships in connection with his studies of plants and in doing so rejected the Aristotelian doctrine that animals, plants, and the earth existed solely for the sake of man. He claimed that they had their own purposes independent of the needs and interests of human beings. In connection with his specific botanical discoveries, for example, that many plants are dependent on specific habitats, this observation could have spurred the development of a Western ecological perspective.¹⁹ Theophrastus' work, however, went unnoticed and had no influence on the course of Western philosophy and thought. As a result, the environmentally sound aspects of his philosophy are of historical interest only and irrelevant to the history of ideas that produced modern attitudes toward nature.

The Aesthetic Perspective

Although Greek philosophers did have feelings of appreciation and admiration for the world, those feelings were not primarily aesthetic. The characteristic of the world they most strongly reacted to was its order, not its beauty. Their emotional response was much like that of an automobile mechanic looking over a well-engineered motor or a mathematician going over a complex proof. Evidence of the lack of any genuine aesthetic feeling can still be found in the modern word *cosmetic*, which is derived from the Greek word *cosmos*, the technical philosophical term for the world or universe. *Cosmetic* does stand for a kind of beauty, but it is a superficial beauty that hides or veils the actual appearance of a thing or person. This sense of beauty originated in the Greek idea that ultimate reality is concealed and distorted by sensation and as such has nothing to do with beauty in its primary Greek sense in connection with the fundamental nature of reality, the human soul, and moral goodness.

There is ample evidence in the surviving poetry, drama, and art of ancient Greece to conclude that periodically throughout Greek cultural history, a deep appreciation and love of nature was fashionable.²⁰ Judging by the existent philosophical writings, however, Greek philosophers never shared these feelings with their artistic and literary counterparts. This difference in attitude seems to have resulted from the fact that writers and artists concentrated on the world of the senses, drawing inspiration from it in a way that philosophers could not, obsessed as they were with their efforts to uncover the ultimate reality that they believed was hidden by sensation. Put another way, philosophers developed no aesthetic appreciation for nature because they were too busy speculating about matter, atoms, and other hypothetical entities that could not be experienced directly by the senses and therefore possessed no visual or aesthetic aspects. Since Greek philosophy was reintroduced into Western thought much ear-

lier than Greek art and literature, this indifference to the beauty of nature was passed on to medieval and early modern philosophers and theologians, who mistook it for a characteristic of Greek culture as a whole and at first tried to emulate it.

Plato came closest to bridging the gap between the aesthetic interests of the literary and artistic community and the metaphysical concerns of the philosophical community. His dialogues reveal not only his philosophical abilities but his literary skills as well. In his theory of forms, moreover, he succeeded in fusing the metaphysical, aesthetic, and ethical together in his ultimate form, the Beautiful and the Good. Yet he too was so enmeshed in the quarrels, controversies, and presuppositions of pre-Socratic philosophy that he could not carry his aesthetic insights very far, and no true appreciation or love of nature emerged in his philosophy.

Plato's dialogues occasionally show that he greatly appreciated nature, but his general philosophical viewpoint forced him into a position that largely ignored the world of nature or treated it contemptuously. In the *Phaedrus*, for example, Socrates and Phaedrus decide to leave the city and hold a philosophical discussion under one of Phaedrus' favorite plane trees in the country. On the way, favorable comments are made about the beauty of the countryside and, reaching the tree, Socrates exclaims:

Upon my word, a delightful resting place, with this tall, spreading plane, and a lovely shade from the high branches of the *agnos*. Now that it's in full flower, it will make the place ever so fragrant. And what a lovely stream under the plane tree, and how cool to the feet!

Although these statements seem to suggest genuine delight in nature, their superficiality is revealed a few lines later when Phaedrus, attempting to continue the conversation in the same vein, is abruptly cut off by Socrates, who says, "You must forgive me, dear friend; I'm a lover of learning, and trees and open country won't teach me anything." This remark is quite serious and follows directly from Plato's epistemological belief that knowledge is gained by dialectical reasoning and contemplation of the forms, not by study of the world of nature.²¹

Metaphysically and aesthetically, Plato's commitment to the theory of forms led him straightforwardly to an antipathy to natural objects. In the *Parmenides*, we find Socrates admitting to Parmenides that he feels that some natural objects are too trivial and undignified to participate in the world of the forms.²² Since natural objects in Plato's philosophy exist only to the degree that they participate in a form, those without forms have no metaphysical status—they do not exist. Aesthetically, the situation is much the same. Beauty is grounded in the form of the Beautiful and the Good, and natural objects are beautiful only insofar as they participate in it.

According to Plato's *Phaedo*, the beauty of the world of the forms is so magnificent that anyone who truly comprehends it must conclude that there is nothing of beauty in the natural world:

If someone could reach to the summit, or put on wings and fly aloft, when he put up his head he would see the world above, just as fishes see our world when they put their heads out of the sea. And if his nature were able to bear the sight, he would recognize that that is the true heaven and the true light and the true earth. For this earth and its stones and all regions in which we live are marred and corroded, just as in the sea everything is corroded by the brine, and there is no vegetation worth mentioning, and scarcely a degree of perfect formation, but only caverns and sand and measureless mud, and tracts of slime wherever there is earth as well, and nothing is in the least worthy to be judged beautiful by our standards.²³

In the world of the forms, in contrast, the colors are brighter, the trees perfectly proportioned, and the surfaces of rocks and other natural objects smooth, shiny, and unbroken.

As mentioned earlier, one of the most positive aspects of Plato's philosophy is the Beautiful and the Good, which as the ultimate form serves as the source of both fact and value or, put another way, as the source of science and ethics. This position, which gives ethical and aesthetic value a fully objective status, would be very useful to environmental philosophy except for the fact that Plato insists on locating the Beautiful and the Good outside and beyond the physical world. The beauty of the world of the forms needs no protection since it is already permanent, indestructable, and unchanging. The beauty of the natural world, however, cannot be preserved or protected in part because it is not truly beautiful but primarily because it does not really exist.

The same kinds of problems arise in terms of the theory of participation with regard to degrees of beauty. In this context, nature is less beautiful and less valuable because it lacks the perfection of the forms. Aesthetically, Plato's notion of perfection translates into a preference for mathematical proportions and ideal geometric shapes. This kind of perfection is responsible for much of the sixteenth- and seventeenth-century distaste for mountainous scenery, which for a time inhibited the development of modern nature appreciation. Thomas Burnet, for example, infected by such a Platonic aesthetic perspective, came close to losing his faith in God when, arriving in the vicinity of the Alps in 1671, he found that he was unable to discern any regularity, proportion, or symmetry in the slopes and shapes of the mountains before him. His conclusion that God could not have made such irregular and disorderly piles of rocks eventually cost him his career as a theologian and clergyman, which might otherwise have included appointment as the Archbishop of Canterbury.²⁴

Platonic philosophy seems less incompatible with an environmental point of view today because we are usually first exposed to it in the roman-

tic nature poetry of the late eighteenth and early nineteenth centuries. In this poetry, however, emphasis is placed directly on the beauty of the natural objects that are supposedly trying to conform to the even higher aesthetic and spiritual standards of the Beautiful and the Good. In a sense, the forms are still there, but the objects participating in them have preempted the spotlight. In addition, the metaphysical position attributing reality to the forms and little or no reality to natural objects is gone for the most part, and there is no longer any question that the world we live in exists.

Plato himself would undoubtedly have objected strongly to this misuse of his philosophy, since these metaphysical degrees of reality and perfection were of major importance to him and were the basis of his own rejection of all nature poetry and art in his own time. In the *Republic* he argues that nature as depicted in literature and art is two levels away from the truth, beauty, goodness, and reality of the forms. It is imitation of natural objects that are themselves but pale and imperfect reflections or shadows of the forms. Nature poets and artists, he adds, are unworthy of being part of the ideal society sketched in the *Republic* because their work turns men's minds away from the forms and feeds the irrational elements of the soul at the expense of the rational.²⁵ This position is essentially a forerunner of the medieval view that the aesthetic appreciation of nature should be discouraged because love of nature will detract from love of God and is probably at least in part its source. In this context, concern for the environment certainly cannot flourish and probably cannot develop.

The Metaphysical Perspective

Although Plato's philosophy generally suggests that he neither knew nor cared about environmental problems, one passage in the *Critias* shows that he was very much aware of at least one problem: the effect of deforestation on soil quality in Greece during his own lifetime. Speaking of the erosion that followed the cutting of the trees on the mountainsides, Plato writes that "what is left now is, so to say, the skeleton of a body wasted by disease; the rich, soft soil has been carried off and only the bare framework of the district left." In addition, he notes, in a moment of ecological insight, that before the trees were cut down,

the soil got the benefit of the yearly "water from Zeus," which was not lost, as it is today, by running off a barren ground to the sea; a plentiful supply of it was received into the soil and stored up in the layers of nonporous potter's clay. Thus the moisture absorbed in the higher regions percolated to the hollows and so all quarters were lavishly provided with springs and rivers.²⁶

These observations are especially interesting not so much because they show that Plato had some ecological understanding of the relation of trees,

soil, and water but because Plato has Critias discuss the sudden transformation of the Greek landscape into its modern form *matter-of-factly*, simply as a curious historical event. Although Plato makes it quite clear that he understands not only what happened but also the environmental consequences, there is absolutely no suggestion of the modern concern and alarm that would arise if such an event occurred today.

This indifference cannot in this case be attributed to lack of ecological knowledge, for Plato's understanding of this particular situation is probably as good as that of most natural history scientists in the nineteenth century. Nor can it simply be a matter of aesthetic distaste for nature, since Plato specifically speaks of the problem in terms of the instrumental agricultural value of the land. It is of course possible that Plato was unconcerned because he thought that enough remnants of the original land remained that the destruction of much of Greece's soil did not matter. Even if that is so, however, it seems likely that his attitude was also shaped very significantly by the metaphysical perspective that he inherited from the pre-Socratics: the view that the natural world was an illusion and did not exist as experienced in any fundamental sense.

Given the emphasis that Greek philosophers from Thales on placed on the physical existence of the world and their obsessive attention to the problem of change, it is safe to say that the Greeks were very much concerned about the continuing existence of the world. I want to suggest, however, that it was probably much more than just that: that the Greeks were probably chronically suffering from a case of what might be called existential angst, that they were deeply bothered by the possibility that matter might pop into and out of existence. Feeling terribly insecure, they wanted proof that the world could not stop existing, that it was permanent, indestructible, eternal, and unchanging. In other words, some sort of existential distress may well have been what the problem of change was really all about.

This interpretation is supported, in particular, by Aristotle's reference to "men of narrow outlook" who thought that changes in the environment, for example, the drying up of the seas, represented a change in the amount of physical matter existing in the world.²⁷ While it might be objected that Plato's indifference about environmental change is evidence that no such angst existed, I would reply that more likely his indifference is simply proof that he, unlike the pre-Socratics, already had a philosophical theory—according to which the world is only an illusion—that permitted him calmly to accept and ignore environmental change as inconsequential.

If this hypothesis is correct, then the problem of change in early Greek philosophy was in reality a curious version of the problem of nature preservation that is solved by defining the problem out of existence. On the one hand, the world as experienced cannot be destroyed because it does not really exist. On the other hand, the world as it really exists cannot be destroyed, or even damaged, because it is already indestructible and

unchanging. For most of the Greeks, including Aristotle, this second, unseen world is composed of some kind of physical matter. Plato differs with them in that he hypothesizes a mental world, the world of the forms, rather than a physical one. In either case, however, the environmental implications, or lack of them, are the same.

Actually, the proper division is not between Plato and the pre-Socratic materialists, who all agreed that the world as experienced is an illusion, but rather between Aristotle and his predecessors, including Plato, since, to the contrary, Aristotle believed that the world as experienced is real. In terms of pre-Aristotelian positions, whatever is taken to exist, to paraphrase Parmenides, as well as the first law of thermodynamics, simply is and cannot not be; whatever is considered not to exist simply is not and cannot be. Since, in this view, the world of sensation or experience fundamentally involves nonbeing, as things in it pop into and out of existence from moment to moment as part of the process of change, nothing in that world has enough permanence for nature preservation to make any sense. In the world of ultimate reality, material or formal, on the other hand, given its indestructible and unchanging nature, there is too much permanence for nature preservation to make any sense.

When we turn to the metaphysics of Aristotle, in which the world of experience really does exist, the situation becomes more complicated but still does not produce conditions that are conducive to nature preservation attitudes. According to Aristotle's metaphysics, the world is a gigantic conglomeration of matter undergoing perpetual change through an infinite period of time as a result of movement generated and guaranteed by an eternal source of movement, the Unmoved Mover. In the *Meteorology*, Aristotle concedes that many parts of the Earth are deteriorating, but he emphasizes that all deterioration is balanced by improvements in environmental conditions elsewhere. As land in one place dries up and becomes uninhabitable desert, other land becomes inhabitable, because the water has to go somewhere.²⁸ Given that time is infinite and the universe eternal, no part of the Earth can be expected to remain in any particular state. This situation, however, does not produce the need for efforts to preserve nature; it simply requires that humans relocate very slowly over time as the habitability of various parts of the Earth changes.

Although these cyclic environmental changes on the Earth's surface are massive and probably beyond human control, they are not a matter of chance and are not entirely unpredictable. All of these changes are either simple movement of matter through space or the actualization of potential form in particular substances. For the most part, the changes are even reversible. Presumably, given the size of the universe, and assuming, as Aristotle believed, that the universe exists for the sake of man, there will always be a suitable amount of appropriately actualized matter to fulfill human needs. As a result, there is no cause for environmental alarm.

In Aristotle's system, there is really only one way in which preserva-

tionist concern could reasonably have developed—with regard to the preservation of species. Although in rejecting the theory of evolution Aristotle concluded that the forms for each species of animal and plant were eternal and unchanging, he did recognize that most plants and animals needed actual parents to come into existence. Thus if all individuals capable of having offspring in a particular species were lost, presumably their form would never be actualized again. Although Aristotle considers this possibility in his *Metaphysics*,²⁹ such an occurrence did not seem very likely to him and did not suggest any need for concern. For all practical purposes, in Aristotle's time, the extinction of a species was and could only be a theoretical possibility. Since the classification of plants and animals had not been carried very far and since most of the world remained unknown and unexplored, the ranges of animals and plants already classified could not have been determined with any accuracy, and without that information, it would have been impossible to tell if a local decline in a species was having an effect on the survival of the species as a whole.

Moreover, even though the recognition that species extinctions could occur seems to suggest that human beings could also become extinct, opening up the possibility of some concern for future generations, humans are a special case in Aristotle's philosophy. In his ethics Aristotle rules out any moral concern for future generations on the grounds that including posterity into ethical deliberation would make the decision process too complicated.³⁰ In addition, there are metaphysical and religious reasons for not being concerned. The general Greek position, held by Plato and most, if not all, of the pre-Socratics, was that the human soul was immortal and indestructible. As mentioned earlier, Plato depicts Socrates in the *Phaedo* as looking forward to his physical death as a release from the world of sensation that would allow him to be able to reason more clearly. In Aristotle's philosophy, a human being is an unmoved mover, something that can move other things without itself being moved, which in environmental terms translates into an entity that can affect its environment without itself being affected. In this way, Aristotle, like all the other Greek philosophers, attributes absolute permanence and indestructibility to humans and removes them from the kind of dependency on the natural world needed to support any concern for the preservation of nature on instrumental grounds.

Although I have treated the incompatibility of Greek philosophy and modern nature preservation attitudes in terms of three perspectives, the fundamental source of all the difficulties discussed is the metaphysical perspective, for the problems that prevented the development of the ecological and aesthetic perspectives are really metaphysical. Ecological knowledge did not develop in any significant way in Greece because ecological nature was not fundamentally real from the standpoint of Greek metaphysics and therefore could not be the object of knowledge. Likewise,

following Plato, who draws the conclusion most clearly, nothing in the nature world is beautiful because metaphysically, once again, nature is imperfect and at best only partially real.

For nature preservation attitudes to have arisen in ancient Greece, Greek philosophers would have needed to develop a basic set of metaphysical assumptions very different from the ones outlined in this chapter. Essentially, nature had to be more permanent than the fleeting reality attributed to the world of experience and much less permanent than the unchanging and indestructible reality of the forms or material substance. For efforts to preserve natural objects to make sense, first of all, those objects have to be reasonably permanent under some set of normal conditions. Second, they have to be impermanent enough that they can be damaged. Third, it has to be possible for human action and inaction to affect the continued existence of those objects in a significant way. Aristotle came close to developing such a position in his geological writings but was prevented from doing so by his own acceptance of the general Greek belief in the indestructibility of ultimate reality. The proper conception of nature did not appear until the end of the eighteenth century with the establishment of uniformitarianism in geology, when it was finally realized that although nature changed slowly in accordance with physical and chemical processes, humans, acting as geological agents, for example, comparable in scale to glaciers, earthquakes, and volcanoes, could accelerate such change, with catastrophic effect.

MODERN PHILOSOPHY

Although Greek philosophy is the primary source of the philosophical perspectives that have historically inhibited the development of appropriate environmental and preservationist attitudes, a second period in the history of philosophy has also played a similar role. This is the modern period, which begins in the early seventeenth century and includes most of the twentieth century. This period may be broken down into three sub-periods: the early modern period, which is characterized by two philosophical movements, rationalism and empiricism; nineteenth-century philosophy; and twentieth-century or contemporary philosophy. For our purposes, it will not be necessary to examine each of these in any detail. Despite the fact that the philosophical approaches in each subperiod are markedly different, the features of the modern period that are important environmentally are common to all three.

Because these features developed in part in reaction to the philosophical perspectives of the medieval period that preceded it, some discussion of the relationship of the two periods is required. The medieval period was really more a religious than a philosophical period. Medieval philosophy

remained almost entirely within a Christian religious framework. In the early Middle Ages, the connection with Greek philosophy was broken and the primary task of philosophers in the middle and late Middle Ages was the reintroduction and assimilation of Greek philosophy, specifically the writings of Plato and Aristotle, into a fully Christian context. Because from a Christian standpoint, God existed beyond rather than in the world, in a relationship that was similar to the relationship between the world and Plato's forms, the general features of early Christian philosophy tended to be Platonic, and much time and effort was devoted to the problem of the existence of universals, essentially Platonic forms. In the late Middle Ages, after nearly all of Aristotle's writings had been reintroduced, Aristotelian-style philosophy gradually overshadowed the earlier Platonism. Because Aristotle was so important at the end of the medieval period, early modern philosophers reacted against his writings specifically, overlooking his contributions, for example, to science, and adopted a philosophical perspective that was in spirit Platonic and Pythagorean. This perspective was then consciously used as the foundation for the development of modern science as we know it, with unfortunate results from an environmental standpoint, as we have already seen.

One of the little-recognized but, for our purposes, critical differences between the medieval and early modern periods was the general approach to *thinking* in each period. During the Middle Ages, it was customary to *think symbolically*. A medieval Christian, when confronted with natural objects or images of natural objects, for example, pictures of fish, birds, and trees, automatically tried to find Christian religious significance in them by associating them with parables and key remarks in the Bible. In the early modern period, in contrast, it became customary to *think representationally*. Instead of associating images as symbols with biblical stories and sayings, people thought of the images as representations of natural objects. If they saw a picture of a fish or a bird, they thought about real fish and birds in the world. The emergence of the representational perspective is most obvious in painting, which became increasingly realistic over the next two centuries, but it is equally important in modern philosophy, which became obsessed with the analysis of the relationship of mental images created out of sensory experience and physical objects in the external world.³¹

The key philosopher in the early modern period, and indeed the entire modern period, was René Descartes. It was his philosophy that created the representational puzzle that gave modern philosophy its characteristic form. Even though all philosophers since Descartes have been critical of his philosophy, all have worked within a philosophical framework that is entirely Cartesian. Because Descartes' influence is primarily in terms of his general approach to philosophy, independent of the conclusions he reached, he is not, strictly speaking, the father of modern

philosophy but is more accurately the father of modern philosophical problems. It is in terms of these problems—the existence of the external world, the nature of natural science, and the objectivity of value—that modern philosophy achieved its characteristic antienvironmental bias.

Descartes, Cartesianism, and the Existence of the Natural World

Philosophically, Descartes was a rationalist, like most other philosophers of his time. He looked to Plato and Pythagoras rather than Aristotle for inspiration and was therefore distrustful of sensation, relying instead on the use of reason to gain knowledge. At the beginning of his most important book, *Meditations on First Philosophy*, he set about doubting everything that was not completely certain, seeking at the same time for some statement or principle that was self-evidently true. According to Descartes, *cogito, ergo sum* ("I think, therefore I am") was just such a statement. Descartes believed that at the moment when he thought those words, he was in a position to be absolutely certain intuitively that he existed. Using this knowledge of his own existence as a first principle or premise, he then tried to show by logical argument and the light of reason that God, other human beings, and the material world all existed as well.

Unfortunately, Descartes' whole enterprise depended heavily on his two proofs of God and in turn on God's goodness as a guarantee of the truth of our commonsense belief in the existence of other people and the world. When Descartes' critics rejected these proofs as inconclusive, the whole chain of argument collapsed. All that remained was the method of philosophical doubt, in the first meditation, and the proof of personal existence, in the second, and neither was very satisfactory. Philosophical doubt, first of all, did not provide knowledge; it was a method of undermining belief, and it did so very effectively, undermining all the things that Descartes was trying to prove: the existence of God, other people, and the external world. Second, the proof of personal existence was a proof only from the point of view of the person doing the thinking, and it established a person's existence only as a mental entity, not as a material being.

Although Descartes' philosophical and theological colleagues did not accept his proofs of God, they did accept many of his basic assumptions and all of his basic problems. Adopting self-evident knowledge of personal existence as their starting point, they launched philosophy on a three hundred-year quest for proofs of the existence of God, other minds, and the physical world. Because it was not possible to produce such proofs, this Cartesian enterprise marked the beginning of a period of profound skepticism, with regard not only to the existence of God but also to the existence of the external world.

In terms of the basic Cartesian framework, the problem of the exis-

tence of the external world was an epistemological problem rather than a metaphysical one. The question was not whether the world existed but whether it was possible to know that the world existed. In trying to answer this question, philosophers were attempting to do metaphysics through epistemology. Starting with knowledge of self as a mental entity, the next step for them was an examination of the ideas that were in the mind of that mental entity. This was the representational problem. The Cartesians wanted to know whether these ideas, as mental substance, represented physical objects, as material substance, and if so, whether the properties of these objects, as they appeared in the mind, were represented accurately.

Descartes' conception of matter was somewhat different from that of the Greeks. There were two basic kinds of matter or substance: corporeal, or physical, substance and incorporeal, or mental, substance. Both were created substances created by God, an uncreated substance. These created substances differed from Greek matter in two very significant ways: First, created substance was not permanent and indestructible; rather it was maintained from moment to moment through the power of God, requiring, Descartes believed, the same amount of power for each moment that was required at the time of the original creation. Second, the two kinds of created substance were incapable of interacting with each other. In order for there to be two kinds of substance, it was necessary, Descartes and the early Cartesians maintained, that the substances have no common properties, and since, as a result, they had nothing in common, they could not interact. This situation thus forced God not only to maintain the world from moment to moment but also to solve the problem of the interaction between the two kinds of substances in a very practical way. When human beings decided to move their fingers, God had to do it for them.

Although this conception of God's function in the world suited an age that was deeply religious, since it guaranteed an extremely intimate relationship between each human and God, it created complications with regard to the representation of the properties of physical objects in the mind. Applying a distinction originally made by Galileo,³² Descartes identified two kinds of properties in mental representations: primary and secondary. The primary properties were all examples of extension; the three dimensions—length, width, depth—were properties that could be measured geometrically and quantified. The secondary properties were colors, tastes, smells, and other qualities that could not be quantified and were perceived differently by different people and by the same people at different times. Because of these disagreements about secondary properties, Descartes argued that they were subjective, dependent on the perception of the individual human, and did not represent actual properties in external objects. He concluded that the primary properties were objective and did accurately represent the extension of external objects in space. In reaching this conclusion, however, Descartes created a new problem for his

philosophical system, for if extension existed both in objects in the external world and in representations of those objects in the mind, extension was something common to his two kinds of substance, which, by definition, were not supposed to have anything in common. Thus the representation of extension in human minds required additional assistance and intervention by God.

Despite many differences with Greek theory, the Cartesian theory of matter, as Descartes originally proposed it, also solved the problem of the existence of the natural world in such a way that preservationist concern could not arise. Following the Greek and Christian model, human souls were once again permanent and indestructible. Unlike the Greek conception, physical matter was not permanent and indestructible, and it popped into and out of existence as God sustained it from moment to moment; however, since the existence of physical matter was directly dependent on the exercise of the power of God, there was still no appropriate context for human involvement and concern. Changes in nature, good or bad, were simply God's will and thus beyond human control.

Because of the many problems with Descartes' system, his conception of matter was eventually abandoned as too complicated and too dependent on divine involvement. While in theory the abandonment of Descartes' theory of matter ought to have provided circumstances in which concern for the preservation of nature could develop, in practice this was not the case, for the general Cartesian approach to the problem of matter, in terms of the philosophical doubt employed in the first meditation, made belief in the existence of the physical world appear to be so questionable that most philosophers dropped it from their philosophical systems. The empiricists were the first to do so. Berkeley's arguments that physical matter was an unnecessary hypothesis and that primary properties were just as subjective as secondary properties were followed by Hume's arguments that, strictly speaking, all that we could know was that sensations or impressions existed. Although Kant tried to preserve a conception of the physical world (as the unknowable noumenal world) in his answer to Hume, philosophers in the nineteenth century influenced by Kant dropped reference to the external world from their own philosophies. Thus Kant's philosophy, against his wishes, produced a century of idealism, in which most philosophers and philosophies held that existence was mental only and that the external world did not exist.

This lunacy was finally put effectively to rest at the end of the nineteenth century when G. E. Moore courageously led a rebellion against the philosophies of Kant and Hegel at Cambridge University, which brought about the end of idealism as mainstream philosophy and permitted the rehabilitation of the external world.³³ By that time, however, philosophy, by default, had already missed its opportunity to participate in the creation of modern environmental thought.

Modern Science and Environmental Thought

From a twentieth-century perspective, it is obvious that science has played a fundamental role in shaping the way we think about the environment. Environmentalism, for example, is so closely associated with the science of ecology that the environmental and ecological perspectives are virtually synonymous. This strong and close association, nevertheless, tends to hide the fact that historically, environmental thought developed in a scientific context that was not generally favorable to it. As we shall see in Chapter 3, geology and biology both played significant roles in the creation of the environmental perspective long before anyone knew what ecology or even evolution was. In those days, however, these environmental sciences, then called natural history sciences, were not considered to be a part of mainstream science and frequently were not considered to be part of science at all. This association with the “wrong” kind of science further inhibited the emergence of the environmental perspective in a way that fit together with and complemented the epistemological and metaphysical difficulties with professional philosophy that we have just examined. Although we are now dealing with early modern scientific attitudes, the origins of these attitudes are once again philosophical, and the key figure involved is still René Descartes.

As noted, early modern philosophers, as rationalists, looked to Plato and Pythagoras as their spiritual leaders and reacted against the philosophy of Aristotle. This general orientation also characterized early modern science in the same way and made modern science curiously antiobservational. Although today we think of science as being based on observation, this was not the case in the seventeenth century. Since early modern philosopher-scientists, like Descartes and Galileo, followed the mainstream Greek position, concluding that sensation interfered with the study of nature, they too tried to look beyond the world of experience to find principles that applied to ultimate reality in its most fundamental form. Observation did not make its appearance in modern science until empiricism, more than a century later, had made it more fashionable and Hume’s analysis of causation had revealed the need for experimentation with controls.

The method of early modern science was the application of reason alone and was often referred to as the “geometrical method.” The point of this method was to emphasize physical measurement in terms of extension and to eliminate reference to time. Time was initially deemed unnecessary because the knowledge that these scientists were seeking was supposed to be, in accordance with Greek tradition, necessary, permanent, universal, and eternal, and therefore timeless. As Hanson has pointed out, both Galileo and Descartes were held up several decades in their efforts to discover the formula for the acceleration of falling bodies by their (unconscious) unwillingness to consider time as a key factor. The correct formulation was finally found when Galileo realized that he had to replace distance

squared, the geometrically correct measurement, with time squared.³⁴

The geometrical method also brought with it Greek philosophy's aesthetic preference for idealized, general, simple, perfect geometric figures. This preference likewise had some inhibiting influence. Kepler, for example, was delayed in his discovery of the shape of the orbits of the planets by his belief that the ellipse was not a perfect figure.³⁵ Despite such problems, the tendency to characterize nature in a geometrically simple and perfect way continues in modern science even today, especially in research at the atomic and subatomic levels in physics and chemistry.

The primary and most influential aspect of the early modern scientific method, however, has been its reductionist character. The reductionist method, explicitly formulated by Descartes in his *Discourse on Method*, involved the reduction of complex ideas into their simple parts, followed by their reconstruction through reason.³⁶ It worked well in physics and chemistry because scientists were able to isolate key factors as they reduced them to their simple parts. Technological manipulation was achieved through the handling of these simple parts in isolation. This approach has been so successful over the past three centuries that it is still routinely employed today in all scientific research, whether its ultimate orientation is reductionist or holistic.

Because early modern science was fundamentally antiobservational, geometrical, and reductionistic, natural history science did not fit the model of what science was supposed to be. First of all, geologists and biologists studied nature at the level at which it is encountered in experience. As a result, their approach was not rationalistic in any significant way. They spent their time making observations and collecting data, using their senses, not formulating models and hypotheses in accordance with pure reason.

Second, time gradually came to play an inordinate and very ungeometric role in natural history science. Though originally history in the sense in which Aristotle used the term, as inquiry, natural history science evolved into sciences that dealt with history in the sense in which it is used when speaking of human history, as a description of past events. For the most part, time was kept under control in physics and chemistry, playing a role in physical reactions that usually lasted only a few seconds and therefore did not in any important way affect the necessary and universal character of the research being done. In natural history science, however, time expanded so that human history was eventually only a very tiny part of the history of the world as a whole, and in this context, the results of this research were historical statements that were singular rather than universal, contingent rather than necessary, historical rather than eternal and timeless, and therefore, from a mainstream perspective, not very scientific.

Third, because the reductionist method worked less well in the study of the complex geological and biological relationships that make up natural systems and since environmental factors could not usually be manipulated

in isolation, natural history scientists and their work were routinely treated with contempt by their fellow scientists and by philosophers, who did not bother to take them into account in the development of a major field within philosophy, philosophy of science. Only late in this century are efforts to examine the philosophy of geology, biology, and ecology finally under way.

Especially troublesome and embarrassing for natural history scientists was the primary/secondary property distinction. Because physicists limited their observations to primary properties, which according to Galileo and Descartes were supposed to represent physical objects objectively, their observations were acceptably scientific. In contrast, the observations made by geologists and biologists focused on secondary properties—colors, tastes, smells, sounds—that were believed to be apprehended subjectively rather than objectively. The researchers' interest in shapes, moreover, was not primarily for the purpose of precise measurement and hardly ever geometric, since natural objects rarely appear as simple and perfect geometric forms. This focus on secondary properties, as we shall see in Chapter 3, meant that natural history scientists often had more in common with poets and painters than they did with physicists and chemists.

Since modern science through the natural history sciences has had a profound effect on environmental thought, it is unfair to treat modern science as a whole as antienvironmental. However, it is important to realize (1) that the positive influence on environmental thought came out of sciences that did not fit the preferred model of what science should be and (2) that the orientation of the preferred model was completely incompatible with an environmental perspective. As already noted, the preferred model for scientific inquiry encouraged scientists not to think about the environment as it is encountered in experience. This significantly inhibited environmental concern. Scientists who directly studied living and nonliving nature as biological or geological phenomena often expressed concern about the natural objects they studied. Scientists who studied nature at the atomic level in terms of physical or chemical hypotheses about an indestructible material substratum did not. Moreover, the preferred method encouraged mainstream scientists to narrow their focus to very simple, maximally isolated physical and chemical events of very short duration in experiments in a laboratory setting. As a result, this type of scientific research failed to provide a context in which damage to the environment could be identified or assessed. Finally, the emphasis on scientific objectivity reduced the scientist's domain to the collection and analysis of facts as something distinct from values, making concern about nature unscientific and therefore in principle inappropriate.

The Triumph of Fact over Value

Over the past three centuries, value has gradually become less and less important to philosophers and scientists. This change began with the primary/secondary property distinction, gained speed with the *is/ought* or

fact/value distinction of Hume, and culminated with the logical positivists' rejection of ethical and value statements as meaningless in the early twentieth century.

Early modern philosophers and scientists were concerned about finding ways to study nature that were objective. They wanted to deal with facts that were independent of the subjective elements of judgment and perception. It was for this reason that Galileo and Descartes developed the primary/secondary property distinction in the first place. Because primary properties were supposed to be objective, they became the focus of scientific study. Secondary properties, because they were considered subjective, were ignored.

This distinction in turn led directly to a dichotomy between fact and value. Although the idea that facts and values are incompatible was probably not original with Hume, he made it explicit in his *Treatise* in a passage just preceding his discussion of *is* and *ought*, in which he makes specific reference to primary and secondary properties as a precedent:

Vice and virtue . . . may be compar'd to sounds, colours, heat and cold, which, according to modern philosophy, are not qualities in objects, but perceptions in the mind: And this discovery in morals, like the other in physics, is to be regarded as a considerable advancement of the speculative sciences.³⁷

Even though Hume went on to insist that values (for him, sentiments) were nevertheless extremely important ("Nothing can be more real, or concern us more"), his distinction came to be the basis on which the sciences and the humanities were differentiated and separated. From that time on, it was generally held that scientists dealt with facts and humanists with values.

Although this division had little effect on the humanities and humanities scholars, it encouraged major changes in the way that scientists looked at the world and the manner in which they were educated. Feeling that value considerations adversely influenced their objectivity, scientists began avoiding humanities training in values and adopted a doctrine of moral neutrality with regard to their work. The result was an estrangement of the sciences from the humanities such that scientists generally lost the desire and the ability to communicate with nonscientific scholars. After these attitudes were defended by logical positivists in the early twentieth century, the gap grew to the point that many scientists were no longer willing to accept that the work of humanists had any meaning at all. According to the positivists, statements about values are scientifically (or factually) unverifiable and are therefore nonsense; talk about values is just the expression of emotion and has no objective significance.³⁸ By the middle of the twentieth century, the sciences and the humanities were generally considered to be so different from each other that they could appropriately be characterized as two different cultures.³⁹

To see the effect of the scientific fascination with fact on the humanistic values of scientists, we must return to the nineteenth century, a time

when scientists still received training in the humanities. In his autobiography, for example, Charles Darwin writes:

Up to the age of thirty, or beyond it, poetry of many kinds, such as the work of Milton, Gray, Byron, Wordsworth, Coleridge, and Shelley, gave me great pleasure, and even as a schoolboy I took intense delight in Shakespeare, especially in the historical plays. I have also said that formerly pictures gave me considerable, and music very great delight. But now for many years I cannot endure to read a line of poetry; I have tried lately to read Shakespeare, and have found it so intolerably dull that it nauseated me. I have also lost my taste for pictures and music. . . . I retain some taste for fine scenery, but it does not cause me the exquisite delight which it formerly did.⁴⁰

In the next paragraph Darwin continues:

My mind seems to have become a kind of machine, for grinding general laws out of large collections of facts, but why this should have caused the atrophy of that part of the brain alone, on which the higher tastes depend, I cannot conceive. A man with a mind more highly organized or better constituted than mine, would not, I suppose, have thus suffered; and if I had to live my life again, I would have made a rule to read some poetry and listen to some music at least once every week; for perhaps parts of my brain now atrophied would thus have been kept active through use. The loss of these tastes is a loss of happiness, and may be injurious to the intellect, and more probably to the moral character, by enfeebling the emotional part of our nature.⁴¹

Though this loss of taste is a mystery to Darwin, it need be no mystery to us. It is a natural consequence of his attempt to be scientific, to deal with the facts alone. This experience is uncommon today only because scientists are now usually so little exposed to the humanities in their education that they are unable to note, let alone lament, their insensitivity and even aversion to literature, poetry, art, philosophy, music, religion, and ethics.

Darwin expresses concern that his moral character may have been affected. Although he gives no example in his autobiography, a comparison of his account of his travels on the *Beagle* with his later writings suggests that his concern on this point was justified. The journal is filled with many strong expressions of concern for the welfare of primitive peoples. Speaking of the war of extermination in Bahía Blanca, for example, he writes: "Who would believe that in this age such atrocities could be committed in a Christian civilised country?" After a few paragraphs of description he adds: "It is melancholy to trace how the Indians have given way before the Spanish invaders."⁴² In *The Descent of Man*, however, the emotional and moral tone has vanished. "At some future period," he writes, "not very distant as measured by centuries, the civilised races of man will almost certainly exterminate, replace the savage races throughout the world. At the same time the anthropomorphous apes . . . will no doubt be exterminated." Here the extermination of human beings is nothing more

than the natural order of things in accordance with the principles of evolution: "it is the same problem as that presented by the extinction of the higher animals—of the fossil horse, for instance."⁴³ For Darwin, primitive peoples have become facts to be worked into theories: objects of scientific interest, not moral concern. Scientific detachment and objectivity have resulted in the suspension of moral concern.

Because the natural world confronted natural history scientists in their daily work, it was hard for them to follow the mainstream trend and dismiss the beauty of nature. As Darwin notes, he retained "some taste for fine scenery," although it ceased producing "the exquisite delight which it formerly did." Aesthetics as a philosophical discipline was nevertheless significantly influenced. Although aesthetics in the late seventeenth century literally began with an examination of the sublime, the terrifying in nature, in contrast to the beautiful, it gradually lost interest in nature and natural beauty, leaving the growing movement in natural appreciation with little theoretical support. The subsequent discussion of natural beauty over the next two centuries, under the heading of philosophical criticism, focused on aesthetic taste in picturesque beauty in natural scenery and is not generally regarded as part of the history of philosophy today. Except for passing reference to Burke's and Kant's discussions of the sublime, aesthetics as taught in the twentieth century usually ignores nature and natural beauty. The subject has even been redefined as the study of art, rather than beauty, thereby eliminating the context in which natural beauty can be discussed. By the nineteenth century, when the preservation of natural beauty had become both an ethical and political issue in Western civilization, most philosophers had already lost interest and were thus not able or willing to contribute to the environmental debate.

PHILOSOPHY AND ENVIRONMENTAL THOUGHT

Because most academic and scientific disciplines have come directly out of philosophy—for example, history, mathematics, astronomy, physics, sociology, psychology, political science, economics, and linguistics—professional philosophers can take a great deal of pride in their role in the shaping of Western civilization. Some suggestion of the historical importance of philosophy is retained even today in academic education with the Ph.D., which is a degree in philosophy whether any courses in philosophy have been taken or not. It was, however, much more obvious in the last century, when scientists were still called, and thought of themselves, as natural philosophers.⁴⁴

As should be clear from my brief discussions of the Greek and early modern periods, philosophy was especially important to the development of modern science. Greek speculations about nature established the context

in which modern science would develop, and early modern philosophers working with, and indeed as, scientists charted the course that science would take throughout the modern period. Although philosophy has, of course, made many contributions to Western civilization, this is probably its greatest triumph.

Despite philosophy's many monumental achievements, however, it has consistently failed to provide a foundation for environmental thought throughout the course of Western civilization. This failure has been widespread throughout its major divisions: metaphysics, epistemology, ethics, social and political philosophy, philosophy of science, and, of course, aesthetics. In particular, the notions of permanence and indestructibility attributed to physical matter in Greek metaphysics made it difficult right into this century for many Westerners to think in environmental terms. The skepticism about the existence of the world in epistemology in modern philosophy over the past three centuries likewise made philosophy irrelevant to the historical development of environmental thought, especially in the nineteenth century. Both periods inhibited the development of a theory of natural beauty, and modern philosophy seriously undermined the foundations of ethics and value theory in general. Finally, philosophy of science has consistently undercut the legitimacy of the environmental or natural history sciences, further compounding the problem, and as we shall see in the next chapter, even social and political philosophy has ignored the environment, for example, in developing our modern theory of property.

Nevertheless, even though these negative influences on environmental thought are easy to locate—indeed, they are often the main features of the history of philosophy—there is a tendency among Western philosophers today to deny all the points made in this chapter, categorically and without any argument, as if they can simply refuse to believe in the damage that traditional Western philosophy has done environmentally in the same way that their predecessors refused to believe that the external world exists. According to these philosophers, philosophy did not and does not inhibit environmental thought; environmental thought just happens to be incompatible with Western thought, traditions, and civilization.

This attitude among professional philosophers is especially unfortunate, for it serves no constructive purpose and indeed perpetuates the very problems that are being denied. The environmental crisis is certainly the most serious problem confronting Western civilization today, and it is only fitting and proper that philosophy and philosophers should play a key role in solving it. Refusing to participate—that is, refusing to help with the establishment at long last of proper intellectual foundations for environmental thought—does not protect the integrity of the history of philosophy but instead defames it. It runs counter to the spirit of philosophy, which is supposed to be a search for truth, not a defense of traditional principles, right or wrong, as if they are the dogmatic beliefs of a primitive tribe, unable to accept criticism of their beliefs or change in the world.

While it is true that environmental ethics is fundamentally in conflict with many traditional assumptions in the history of philosophy, this fact does not make environmental ethics unphilosophical. Such conflicts constitute most of what counts as the history of philosophy today. If criticism of traditional philosophy is now declared unphilosophical, contemporary mainstream philosophy, by discouraging critical inquiry and debate, has made itself unphilosophical.

Environmental ethics is philosophy's opportunity to rectify its greatest error, the rejection of the natural world as it is experienced concretely in real life. Not to do so, moreover, would be to deny its own past, to give up its historic intellectual role in Western society, and to allow the study of philosophy to become archaic, irrelevant, and silly.

At the beginning of this century, Nathaniel Southgate Shaler, a Harvard geologist, wrote a book called *Man and the Earth* in which he attempted to deal comprehensively with the scientific, ethical, and aesthetic issues in the nature preservation and conservation movements of his time. Aware that traditional philosophy had little to offer as a philosophy of nature and that all the possible positions were "ancient and rather out of date," he tried to find a school of philosophy that could plausibly be twisted into providing some support for an environmental ethic. Choosing solipsism, a radical philosophical position that absolutely denies the existence of the external world and other minds, he argued that some protection for nature could be justified even in terms of it if we are willing to accept that "the universe is an extension of man."⁴⁵ Let us hope that nature preservationists and conservationists at the beginning of the next century will have a better selection of mainstream philosophical theories available to them so that they will not feel forced, as Shaler was, to select as the foundation of their environmental philosophy a position that denies the very existence of what they are trying to protect.

NOTES

1. Aldo Leopold, "The Land Ethic," in *A Sand County Almanac, and Sketches Here and There* (New York: Oxford University Press, 1949), pp. 209–210; *A Sand County Almanac: With Essays on Conservation from Round River* (New York: Ballantine Books, 1970), p. 246.

2. Genesis 1:26, 28.

3. John Passmore, *Man's Responsibility for Nature: Ecological Problems and Western Traditions* (London: Duckworth, 1974), p. 7n.

4. Ibid.

5. Aristotle, *Politics* 1256b20; J. Donald Hughes, "Ecology in Ancient Greece," *Inquiry* 18 (1975): 124.

6. John Locke, *The Second Treatise of Government*, ch. 5.

7. Milton C. Nahm, ed., *Selections from Early Greek Philosophy*, 4th ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1964), p. 42.

8. Ibid., pp. 123–124.

9. Ibid., pp. 38–39.
10. Aristotle, *De Anima* 405a19; 411a7
11. Nahm, *Early Greek Philosophy*, pp. 39–40.
12. Ibid., pp. 93–94.
13. Plato, *Phaedo* 78b–84b.
14. For a concise account of the importance of these kinds of relationships, see Aristotle, *Nicomachean Ethics* 1139b18–35.
15. Aristotle, *De Partibus Animalium* 640b18–29.
16. Aristotle, *Meteorology* 351a19–353a26.
17. Ibid., 352b25–30.
18. Aristotle, *Politics* 1256b7–22.
19. Hughes, "Ecology in Ancient Greece," pp. 122–124.
20. See Henry Rushton Fairclough, *Love of Nature among the Greeks and Romans* (White Plains, N.Y.: Longman, 1930).
21. Plato, *Phaedrus* 227a–230e.
22. Plato, *Parmenides* 130c–e.
23. Plato, *Phaedo* 109e–110b.
24. Marjorie Hope Nicolson, *Mountain Gloom and Mountain Glory: The Development of the Aesthetic of the Infinite* (New York: Norton, 1963), pp. 207–217.
25. Plato, *Republic* 600e–607c.
26. Plato, *Critias* 111a–d.
27. Aristotle, *Meteorology* 352a16–30.
28. Ibid., bk. 1, ch. 14.
29. Aristotle, *Metaphysics* 1034b15–19.
30. Aristotle, *Nicomachean Ethics* 1097b9–15.
31. The best discussion of symbolism in the Middle Ages as a way of thinking can be found in J. Huizinga, *The Waning of the Middle Ages: A Study of the Forms of Life, Thought and Art in France and the Netherlands in the XIVth and XVth Centuries* (New York: St. Martin's Press, 1924), pp. 182–194. As Huizinga notes, although it is hard for us today not to view symbolism as "a short-circuit of thought," it is possible to view it "in a more favorable light by abandoning for a while the point of view of modern science" and taking "into account the fact that it is indissolubly linked up with the conception of the world which was called Realism in the Middle Ages, and which modern philosophy prefers to call, though less correctly, Platonic Idealism" (pp. 184–185). For an excellent discussion of the change from symbolism to representation in painting, see Kenneth Clark, *Landscape into Art* (New York: Harper & Row, 1976), esp. ch. 1–2.
32. Galileo, "The Assayer," in *Discoveries and Opinions of Galileo*, trans. Stillman Drake (Garden City, N.Y.: Doubleday/Anchor Books, 1957), p. 274. Descartes introduces the distinction implicitly in his discussion of a piece of wax in his second meditation and explicitly in the third. It is regularly discussed in his replies to the objections of his critics.
33. G. E. Moore's attack on idealism began with "The Nature of Judgment," *Mind* 8 (1899): 176–193. It was followed by "The Refutation of Idealism," *Mind* 12 (1903): 433–453. Moore is best known for two later papers on the subject, "A Defense of Common Sense," published in 1925, and "Proof of the External World," published in 1939, both of which can be found in G. E. Moore, *Philosophical Papers* (London: George Allen & Unwin, 1959), pp. 32–59, 127–150.
34. Norwood Russell Hanson, *Patterns of Discovery* (Cambridge: Cambridge University Press, 1965), pp. 37–49.
35. Ibid., pp. 70–83.

36. René Descartes, *Discourse on Method*, pt. 2.
37. David Hume, *A Treatise on Human Nature*, bk. 3, sec. 1.
38. See A. J. Ayer, "Critique of Ethics and Theology," in *Language, Truth and Logic* (New York: Dover Publications, 1950), pp. 102–120.
39. C. P. Snow, *The Two Cultures and the Scientific Revolution* (New York: Cambridge University Press, 1961). See also C. P. Snow, "The Moral Unneutrality of Science," in C. P. Snow, *Public Affairs* (New York: Scribner, 1971), pp. 187–198.
40. Francis Darwin, ed., *The Autobiography of Charles Darwin and Selected Letters* (New York: Dover Publications, 1958), pp. 53–54.
41. *Ibid.*, p. 54.
42. Charles Darwin, *The Voyage of the Beagle* (New York: Bantam Books, 1958), pp. 88–89.
43. Charles Darwin, *The Origin of Species* and *The Descent of Man* (New York: Modern Library, n.d.) pp. 521, 550.
44. The term *scientist* was invented by a British philosopher named William Whewell in 1840 because he felt that there were beginning to be too many people claiming to be philosophers who by training were not.
45. Nathaniel Southgate Shaler, *Man and the Earth* (New York: Duffield & Company, 1917), pp. 228–229.