VALUING NATURE
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A SET OF PAPERS RESULTING FROM THE SHIPMAN WORKSHOP

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FOREWORD

When the ecological economist Robert Costanza and 12 co-authors published their estimate that the economic value of the world’s ecosystem services was perhaps twice the annual value of all of the world’s economic activity, many environmentalists cheered this recognition of the “value of nature” (*Nature*, May 15, 1997, 253-60). However, others were critical of the way the question was posed by Costanza and his coauthors and of the methods used to develop the estimate of value.

Stimulated by the ensuing public discussion, several Bowdoin faculty and friends began to meet regularly during the spring of 1998 to discuss the broader range of ecological, ethical, aesthetic, and economic issues surrounding the concept of the “value of nature.” These meetings were organized as the Valuing Nature Workshop and were supported by the William D. Shipman Professorship Fund. The participants in the Workshop represented the disciplines of ecology, economics, history, philosophy, and the visual arts. The objective of the Workshop was to encourage dialogue and mutual education among faculty from diverse disciplines sharing interests in environmental science, ethics, economics and policy.

Each Workshop participant organized one meeting by formulating a set of questions from his or her disciplinary perspective, compiling a set of readings, and leading the group’s discussion of these questions. After these meetings, six of us prepared papers based on our discussions and readings. We also gave a series of public lectures based on our papers under the sponsorship of the Environmental Studies Program during the fall of 1998. Revised versions of these papers have now been brought together in this publication.

Ed Gilfillan started the series of public talks with an overview of ecological principles and a discussion of what “nature” as represented by ecosystems does for us as a provider of ecosystem functions, services, and goods.
Rick Freeman followed with more detailed description of the paper by Costanza and his coauthors and a critique of the paper from an economic perspective. He concluded by saying that the answer to the question of “What is nature worth?” is “A Lot!” But he argued that for a variety of reasons, the numerical estimate of value provided in the paper can not be taken seriously as a guide to environmental policy.

Sarah McMahon argued that to answer the question posed by the Workshop, we need to understand the cultural precedents of these values. Ed Hawes examined the ancient and modern myths that lie behind current conceptualizations of the value of nature. He took issue with the usual understandings of Garrett Hardin’s “Tragedy of the Commons,” and explored the value and myths of the commons historically.

Larry Simon analyzed the various dimensions of the concept of value, arguing that nature has a type of value that can be reduced neither to instrumental value, favored by economists, nor to objective, intrinsic value, favored by many environmentalists. Given this, he concluded that nature has at least one form of value that lies outside of the instrumental value that Costanza and his coauthors tried to estimate and that cannot be captured by their methods.

Finally Tom Cornell argued that valuing nature is an antidote to the hubris and religious illusions underpinning the abusive misuse of technology and that through a recognition of the priority of nature for both reason and being, we can create a cultural understanding of the imperative of protecting the environment.

The publication of these papers has been made possible by the support of the William D. Shipman Professorship Fund and the Psi Upsilon Environmental Studies Fund of Bowdoin College. David Vail was a valuable contributor to the Workshop discussions. Becky Koulouris, then the Program Administrator of the Environmental Studies Program, assisted the project by managing the arrangements for the Workshop discussions, public lectures, and the preparation of this volume. Tom Cornell and Ed Geis of Headwaters Writing and Design designed this volume.

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Edward L. Hawes is an independent Consulting Historian. He received his Ph.D. from University of Wisconsin, Madison in European social history in 1971. He retired as Professor Emeritus, University of Illinois at Springfield in 1991. Over the past ten years since living in Maine, he has prepared interpretive and exhibit plans for museums in the Midwest and the Northeast, and reviewed historic resources under Section 106 of the
National Historic Preservation Act. He has published numerous articles on the history of museums and society, on agricultural history and on industrial pollution history. The themes explored in his contribution to this volume have been of interest to him ever since he beginning teaching in the Environmental Studies Program at Sangamon State University in Springfield, IL. in 1972.

Sarah F. McMahon is Associate Professor of History at Bowdoin College. She received her Ph.D. in 1982 in the History of American Civilization at Brandeis University. Her articles on the history of diet and the culture of food in New England and the Midwest have been published in Historical Methods, William and Mary Quarterly, Agricultural History, and in essay collections on early American technology and on Midwestern women. Her current research focuses on island ecology, economy, and culture on the Maine coast. Her courses cover colonial and early national U.S. social history, and focus on women, family and community, utopia, and environmental history.

Lawrence H. Simon is Associate Professor of Philosophy at Bowdoin College. He is a graduate of the University of Pennsylvania (history), Cambridge University (philosophy), Oxford University (philosophy) and received his Ph.D. from Boston University. His interests include ethics, environmental philosophy, political philosophy and the philosophy of the social sciences. He has edited Karl Marx: Selected Writings and published articles in numerous journals and anthologies including the Routledge Encyclopedia of Philosophy, The Philosophical Forum, Midwest Studies in Philosophy, World Development, The Review of Politics and the Journal of the History of Ideas.
For the purposes of this essay nature will be defined as consisting of all properties of any given ecosystem which impact and support human existence. Clearly, this is an anthropocentric view of nature. Clearly, there are others who will disagree with this definition of nature. Nevertheless, it is the definition that will be used in this essay.

WHAT IS AN ECOSYSTEM?

Before we can get very far with valuing nature we will have to define what we mean by an ecosystem. A useful view of an ecosystem is that it is a spatially explicit unit of the earth. All parts of an ecosystem need not be contiguous. There are many salt marshes in Maine. They are all parts of the salt marsh ecosystem.

It is useful to think of ecosystems as having an biological part which consists of all the organisms inhabiting the ecosystem as well as all the interactions among them. Ecosystems also have a physical part, which is all of the components of the physical environment within the ecosystem. Both the physical part and the biological part of the ecosystem influence and are influenced by changes in the other part.

Think of a lawn. The physical part is the soil, ground water, the atmosphere etc. The biological part is the grass, weeds, and all of the myriads of very small animals living in the soil. Members of an ecosystem need not be present at all times. A robin who comes to the lawn and preys on worms is a member of the Lawn ecosystem.

The ice storm of 1998 deposited much more wood on the forest floor than usual. As that wood decomposes it will become food for decomposers that may not have been
very important in the ecology of the forest floor. With the increased food the decomposers may become much more important in the ecology of the forest floor.

THINKING ABOUT ECOSYSTEMS

Ecosystems are not locations. They are not objects. They are the result of an ongoing process. That process consists of the interactions between the various critters making up the ecosystem as well as the interactions between the biota and their physical environment. What this means is that ecosystems are in a constant state of change. That is, they are constantly responding to changes in their boundary conditions. Think about a balloon. If you press on one side, the balloon will bulge out in another direction. Ecosystems behave in very much the same way. A change in one part of the ecosystem will lead to changes in some other part of the ecosystem.

ENERGY IN ECOSYSTEMS

Ecosystems exist only so long as energy is flowing through them. In most ecosystems the source of energy is photosynthesis carried out by green plants. Less commonly, the source of energy flowing through an ecosystem is in the form of bacteria decomposing dead organic matter (detritus). In the deep sea there are ecosystems which have developed around hot vents, and there the source of energy is chemosynthesis which is carried out by bacteria.

In a typical food chain based on photosynthesis there are major losses of energy every time that it is moved up to the next level in the food chain. The various stages in the food chain are called trophic levels. Typically as much as 90% of the energy reaching a trophic level is dissipated before the energy is transferred to the next trophic level. For example, in a food chain consisting of five trophic levels, if we start with 500,000 units of radiant energy from the sun, only 1 unit of energy reaches the top of the food chain where much of human food comes from.

At each step up the food chain energy is lost through respiration. The critters must use energy to search for food. Energy is lost as feces. Critters do not perfectly absorb all of the energy in their food. Some of the critters die before they are consumed by their predators; this energy is not transferred to the next trophic level. Respiration is probably the largest single loss of energy within a trophic level. Respiratory losses are directly related to prey density. If food is abundant critters need to expend little energy searching for food. If food is very scarce they will have to expend much more energy searching for food and they will be less efficient.

In open ocean ecosystems food is very scarce. Typically the energy loss when transferring energy from one trophic level to the next will be 90%; only 10% will be transferred
to the next trophic level. In coastal ecosystems where food is more abundant and less time is required to locate food, the energy loss on trophic transfer will be 85%. In upwelling ecosystems where food is extremely abundant trophic losses may be as little as 70%. (See Ryther, 1969 for a further discussion of food chain transfer and an estimate of the maximum possible amount of fish that can be produced by the world’s oceans.)

In most instances in the ocean there is not a single food chain. Instead there will be multiple pathways whereby energy can move from one trophic level to another. This situation is called a food web. If one pathway in the food web is eliminated, the energy will travel through alternative pathways. However, the loss of any given pathway in the food web will cause the ecosystem to change. These multiple pathways make the ecosystem more stable.

Sometimes we humans unintentionally carry out very large ecological experiments. We are not always pleased with the results. Beginning in about 1960, fishermen captured an excessive amount of food fish from the Gulf of Maine and Georges Bank. By the 1990s the groundfish, cod, haddock, hake and flounders, were virtually eliminated from the ecosystem. The same amount of energy flows through the ecosystem today as did in 1960 (or 1620). But with the elimination of the ground fish, the energy flows through different pathways than it did when groundfish were common.

Currently energy flows through the Georges Bank and Gulf of Maine ecosystems in the form of fish that we do not like to eat. Some of these fish are the elasmobranchs (the cartilaginous fish) such as small sharks, skates and rays. Other fish that are extremely abundant include the pelagic fish (fish that swim high in the water column) such as mackerel and herring, and squid. Biomass data for these species show that as the groundfish and food fish biomass decreased, the biomass of elasmobranchs increased dramatically as did the biomass of the pelagic fish such as herring and mackerel. These data also show that in 1960 85% of the fish biomass on Georges Bank was composed of edible groundfish and only 15% was trash fish. But in 1997 the groundfish now comprised only 8% and trash fish 92% of the fish biomass. The total biomass of fish on Georges Bank has not changed. The make up of the fish population has changed. We have virtually eliminated the groundfish. The energy that once flowed through them now flows through trash fish. For further information on the collapse of the groundfish fishery in the NW Atlantic, see Boreman et al., 1997.

THE IMPORTANCE OF INDIVIDUAL SPECIES IN ECOSYSTEMS

Some species merely inhabit ecosystems. Other species are very important in creating and defining ecosystems. Various terms have been used to refer to these two different groups of species. Those species that are important in creating and defining ecosystems have been called Driver species, Keystone species or Rivet species. The other inhabitants of the ecosystem have been called Rider species.
Think of the salt marsh ecosystem. The two species of marsh grass, Spartina patens and Spartina alterniflora create and define the marsh. If they are killed, the marsh will erode. They are the Driver species. Those critters which inhabit the marsh but are not responsible for its existence are the rider species. In a typical Maine salt marsh Spartina patens (the shorter marsh grass) will occupy the high marsh; Spartina alterniflora (the longer marsh grass) will occupy the low marsh. They are both acting to prevent erosion so as to keep the marsh intact.

KELP, SEA OTTERS AND SEA URCHINS IN ALASKA

In the Pacific Northwest there are three species whose interrelations determine the character of the nearshore marine ecosystem. They are:

♦ The Bull Kelp—Macrocystis pyrifera
♦ The Sea Otter—Enhydra lutris
♦ The sea urchin—Strongylocentrotus droebachiensis.

Sea otters are large animals that rely on their fur for insulation. A female otter may weigh 30 kg; a male may weigh 50 kg. Their fur is not as efficient an insulator as the blubber used by seals. As a result, the otters lose a lot of heat to the sea water. To replace this heat they must consume 25-30% of their body weight in food every day. Typically we humans may consume 1-2% of our body weight every day. The preferred prey of the sea otters is sea urchins.

Sea urchins are echinoderms which are voracious predators on marine algae. They especially like to eat kelp.

Kelp are very large marine algae. They attach themselves to the bottom with root-like holdfasts. They grow toward the surface in depths of 20-0 m. Where they are abundant they will create kelp forests that are habitat for many other species which cannot easily exist outside a kelp forest. Thus kelp is a driver species.

The interaction between the sea otters, the kelp, and the sea urchins came about as a result of the fact that sea otter fur is the densest on earth. There can be as many as 50,000 hairs per cm². In the 19th century the demand for sea otter fur was very high; the fur was extremely valuable. The great demand for sea otter fur led to the virtual extinction of this species throughout its range.

As the sea otters were eliminated, it was observed that the once abundant kelp forests had disappeared and with them the other species dependent upon the kelp forest for habitat. The sea urchins, whose population had been kept in check by otters, were freed from predation. They reproduced greatly and were able to consume the kelp forests.
result was a bottom that had no fleshy algae. These were called urchin barrens. In urchin barrens only armored plants such as coralline algae can exist. Urchin barrens are much less productive than kelp forests. For more information on urchin barrens, refer to Chapman, 1981.

Once the sea otters had been eliminated from Alaskan waters, the Russian government could see no further value in the territory. In 1867 they sold Alaska to the US.

Over the past 50 years there has been a large effort to reintroduce the sea otters to their original range. These efforts have been very successful. Sea otters reinvaded Prince William Sound, Alaska in the early 1970s (Estes and Duggins, 1995). As in other locations where the reintroduction of sea otters has been studied, the first ecological change that was noticed was that predation by the otters eliminated sea urchins as important predators of kelp. The kelp forests regrew almost immediately.

There were several other ecological changes that occurred at about the same time. A thriving fishery for butter clams collapsed. A thriving fishery for dungeness crabs also collapsed. After urchins the otters’ favorite foods are clams and crabs.

It is clear that the presence or absence of sea otters is absolutely critical in determining the type of ecosystem that will exist in the North Pacific ocean. The otters are a keystone species. They could also be considered a driver or rivet species.

The interaction between otters and sea urchins raises a question. Is it “better” to have a sea otter dominated community in which there is abundant kelp and those organisms associated with kelp or is it “better” to have a community dominated by sea urchins in which there are abundant clams and crabs? The answer to this question obviously depends on the definition of the word “better.” An unemployed clammer/crabber might prefer the urchin dominated system; those persons who prefer to see the ecosystem in its “natural” state will probably prefer the otter dominated system. Both persons should be aware that the alternation of the urchin dominated state with the otter dominated state has been going on for at least the past thousand years or so (Estes et al., 1978). Which is the “better” state of the ecosystem? Essays by Freeman and Simon (this symposium) will attempt to further define “better” in this context. The reading “Biophilia and the Conservation Ethic” (Wilson, 1993) will give a different view of “better.”

**ECOSYSTEM FUNCTIONS**

Ecosystem functions are those processes that must be carried out so that ecosystems can provide goods and services to humans and others. For more information concerning the way ecosystems function, see Daily, 1997 and Baskin, 1997. Here are some examples of ecosystem functions:
The cycling of water through the earth’s crust maintains the hydrologic cycle.

Biological productivity provides energy. Ecosystems cannot exist if energy is not flowing through them.

Materials such as CO2 cycle through the earth’s crust and oceans. The storage of these materials in sinks is an important process. Sinks are locations on earth where materials are stored.

Decomposition of organic matter to yield inorganic materials such as plant nutrients (nitrogen and phosphorus) are essential for productivity to occur.

The maintenance of biodiversity is an important ecosystem function. Wild ecosystems are much more diverse than managed ecosystems. There are a lot more species in the forest bordering my lawn than there are in the lawn itself.

**ECOSYSTEM GOODS**

Ecosystem goods are those products of the ecosystem that enhance economic wellbeing and thus are commonly given economic value. For example:

- Ecosystem goods can include foodstuffs such as corn from your garden, fish from the ocean, beef, milk, or cheese.
- Ecosystem goods can also include materials such as wood products for construction and paper or asphalt and petroleum.
- Ecosystem goods can also include medicinal plants, antibiotic producing molds or genes that can be used in genetic engineering.
- Tourism and recreation are also ecosystem goods.

**ECOSYSTEM SERVICES**

Ecosystem services are those things that the ecosystem does that maintain or enhance human existence. Services are often highly valued. They are rarely bought and sold. Some examples of ecosystem services are given below:

- Regulating climate
- Cleansing water and air.
- Pollinating crops and other plants. Recently a serious disease of honey bees has been reported. If it becomes widespread the ability of the terrestrial ecosystem to
provide goods and services will be severely compromised. Honey bees are involved, as pollinators, in the reproduction of an enormous number of plant species. Many of these plant species are very important to humans. Although other insects can be important pollinators, honey bees are among the most important.

- Generating and maintaining soils.
- Storing and cycling essential nutrients
- The prevention of erosion.
- Preventing flooding by holding water back in forests or salt marshes.
- Absorbing and detoxifying pollutants. Every year an enormous amount of petroleum enters the sea from natural sources such as oil seeps. There are also anthropogenic inputs of oil to the sea in the form of oil spills, sewage discharges, and other land drainage. This input is consumed by bacteria. If it were not, the ocean would be a lot messier than it is.
- Natural ecosystem provide a major aesthetic experience for humans

For more information concerning ecosystem services see Daily et al., 1997; Daily, 1997; and Mooney and Ehrlich, 1997.

Here is a small scale example of the kinds of goods and services provided by an ecosystem. My front yard and its adjacent forest are a good example of goods and services provided by different types of ecosystems. The grassy part of my yard is an extremely simple ecosystem. It provides virtually no goods and relatively few services. Things that it does do include:

- It prevents erosion.
- It provides a positive aesthetic experience.
- It cycles plant nutrients.
- It supports a very large number of small critters who live in the soil.

The forest adjacent to my lawn is a much more complex ecosystem. It provides many more goods and services:

- It prevents erosion more effectively than the lawn can.
- It slows runoff of rain water much more effectively than a grassy area can. A clearcut forest will yield about 5 times the runoff for the equivalent rain than will a mature forest.
- It is a source of firewood and building materials.
♦ It cycles plant nutrients.
♦ It reduces the heating of the forest floor so that less heat tolerant species can exist.
♦ It maintains biodiversity.
♦ It, like other northern boreal forests, is a sink for CO2.
♦ It provides a very positive aesthetic experience.

For more information about the role of forests in nutrient cycling, see Borman et al, 1968; and Pricheu and Fisher, 1987.

In the hydrologic cycle, water vapor enters the atmosphere as a result of evaporation from water bodies, as a result of transpiration by plants and from volcanic gas. The water vapor in the atmosphere descends to earth in the form of precipitation such as rain and snow. Some of the snow is temporarily (in geologic terms) stored in glaciers. The remainder of the rain and snow reaches various water bodies by three major routes. Water can flow through defined water courses such as streams and rivers. This is runoff. During storm events or during the spring melt, water may flow directly across the surface of the ground to a water body. This is overland flow. Some of the water will infiltrate the ground. This is infiltration. The infiltrated water will flow through the ground until it meets the water table. The water table is the boundary between that part of the earth which is saturated with water and that part which is not. Where there is erosion which lowers the earth’s surface below the water table there will be springs or ponds. All of the water below the surface of the ground is groundwater. Below the water table there will be groundwater flows which may also reach water bodies. For more information concerning the hydrologic cycle and its functions see Fetter, 1994.

The hydrologic cycle produces a large number of services.

♦ It provides groundwater for the growth of vegetation. In Maine approximately 80% of households obtain their drinking water from ground water.
♦ It provides rainfall.
♦ Plants can strip excess nutrients from ground water.

A smaller example of the working of the hydrologic cycle is found in Maquoit Bay. Maquoit Bay lies between Brunswick and Freeport. In 1988 a bloom of phytoplankton caused large parts of Maquoit Bay to become anoxic. As a result, a lot of commercially important shellfish died. There was great concern that the residential development in the Maquoit Bay watershed was contributing excess plant nutrients to the bay and was, therefore, responsible for the plankton bloom.

A research project ensued which looked at the contribution of plant nutrients to Maquoit Bay from its three major tributaries. It was found that during the growing
season the plants adjoining the tributaries were able to strip out the excess plant nutrients. In the wintertime large amounts of plant nutrients reached the bay. Large amounts of nutrients reaching the bay in the winter is not a problem. Phytoplankton do not grow during the winter. In summer when phytoplankton do grow, the vegetation surrounding Maquoit Bay provided the service of nutrient removal.

The origin of the 1988 plankton bloom is not simply explained. Part of the explanation is that the species of phytoplankton that bloomed was not a palatable food for shellfish. As a result the normal effect of predation to reduce population density was not functional. Another part of the explanation may be that art of the watershed of Maquoit Bay is underlain by sand that contains a very large reservoir of ground water and that appears to be high in plant nutrients. A large rainstorm such as that which occurred shortly before the 1988 plankton bloom could have flushed a lot of groundwater into the bay. This water would not be subject to nutrient stripping by plants since it would have come from below the root zone. Simply put, several years of research produced no smoking gun in the Maquoit Bay incident.

The northern boreal forest provides a large scale service by removing CO2 from the atmosphere during the growing season. There has been a substantial increase in CO2 concentrations in the northern atmosphere from 1958 to 1992. It is clear that the northern boreal forest is unable to keep up with the general increase in CO2. However, a great deal of CO2 is removed during each growing season. For more information concerning the role of terrestrial vegetation in CO2 cycling see Houghton, 1987.

Most of the CO2 on earth is in the deep ocean. This CO2 is sequestered from the atmosphere and has no part in global warming. In order to exchange gasses such as CO2 with the atmosphere, ocean water has to be in contact with the atmosphere at the surface of the ocean. The deep ocean is filled with cold, dense water. It is separated from the surface of the ocean (atmosphere) by a relatively thin layer of warmer less dense water. There are only two places on earth where the deep ocean is in contact with the atmosphere. These are the two places on earth where cold, dense water is formed every winter. This cold dense water sinks away from the surface and flows into the deep ocean. The most important location where cold, dense deep ocean water is formed is southeast of Greenland where much North Atlantic Deep Water is formed each winter. The other location is in the Weddel sea in the antarctic. Together these two locations represent a minute fraction of the surface of the ocean.

Unfortunately the transfer of CO2 into the deep ocean is very slow. It may take as much as a thousand years for deep ocean water that sinks off Greenland to surface again in the Antarctic. Thus, although the major CO2 reservoir is in the deep sea, the flow of CO2 into the deep sea is very slow. For more information about the role of the ocean in CO2 cycling see: Broecker and Peng, 1982.

The tropical rain forests also have a major role to play in the global CO2 cycle. Intact rain forest can sequester major amounts of CO2. Unfortunately large areas of rain forest
are being cleared; the services, such as CO2 sequestration, provided by these rain forests are no longer available. The services formerly provided by this part of the environment are no longer available. For more information concerning the role of tropical rain forests in the CO2 cycle as well as information on their destruction see: Brown and Pearce, 1994; Gradwohl and Greenberg, 1988; Southgate, 1998.

What is the value of ecosystem services?

It has been suggested by some but by no means all economists, that the value of ecosystem services is equal to that which it would cost to replace them (Constanza et al., 1997). Other views of the “value” of nature may be found in Freeman, this publication, as well as in: Baskin, 1997; Goulder and Kennedy, 1997; Rolston, 1988 and Simpson and Christensen, 1997.

An excellent question is whether or not we humans have the capacity to replace ecosystem services. We will consider two examples. The first will be reforestation. The second will be the creation of artificial wetlands.

**REFORESTATION**

When we humans cut down a forest we usually replant the area so as to provide a sustainable supply of forest products. A major question is whether the replanted forest will provide the same goods and services as the old growth forest. The old growth forest consists of trees of many species which are of many different ages. The services that the old growth forest provides include:

- Forest products.
- Water management.
- Erosion control.
- Nutrient cycling.
- A very diverse ecosystem.
- A very positive aesthetic experience.

The new forest is essentially a monoculture of trees of a single species, all of the same age. It provides many of the same services as the old growth forest:

- Forest products.
- Water management.
- Erosion control.
Nutrient cycling.

The new forest does not provide as positive an aesthetic experience as the old growth forest. It does not support as diverse a community of wildlife as the old growth forest. For more information concerning reforestation, see Postel and Heise, 1988. In the Pacific Northwest, the new growth forest does not appear to provide those services that are required to support the northern spotted owl and probably other species of wildlife. For more information on the ecology of the spotted owl, see Meyer, et al. 1998; and Yaffee 1994.

ARTIFICIAL WETLANDS.

When wetlands are destroyed during development, the developer is often required to create an artificial wetland in order to compensate for the original loss. Some of the services provided by natural wetlands include:

- Flood prevention
- Erosion control
- Plant nutrient cycling and sequestration.
- A source of detritus to serve as food for detritovores.
- Nursery areas for young marine organisms.
- Wildlife habitat.

In general artificial wetlands tend to provide fewer services than natural wetlands.

- Prevent flooding.
- Recycle nutrients.
- Provide detritus.
- They may or may not prevent erosion. Sometimes they are built in areas that are unsuitable for the existence of wetlands. When this occurs the artificial wetland will disappear as a result of erosion.
- Artificial wetlands may not be an adequate nursery area for young marine animals.
- Often the artificial wetland will not be an acceptable habitat for wildlife.

It is possible to build something that looks very much like a natural wetland and which provides many of the services of a natural wetland. The artificial wetland may not provide some of the other services of a natural wetland. For more information on artificial wetlands, see: Baskin, 1997 and Kent 1994.
CONCLUSIONS

The goods and services provided by the various ecosystems of the earth are the life support system of the human race. We know about some of these goods and services. But there are many others. Usually we find out about these goods and services only when they are no longer supplied. We have a very imperfect understanding of the function of ecosystems. We have an even more imperfect understanding of the potential effects of human activities on ecosystem structure, ecosystem function, and the provision of services by ecosystems.

Our ability to artificially replace those goods and services is not very good. Human efforts to “manage” ecosystems have had very mixed results. Efforts to intervene to change ecosystems, such as reforestation, wetlands restoration, and species reintroductions often times have unanticipated results.

WORKS CITED


There is no question that nature provides us with many valuable goods and services. To drive home this point, Gretchen Daily et al. (1997) asks us to imagine that we are planning to colonize the moon and must decide which species we will take with us, assuming that a suitable climate and atmosphere already exist there. Not only would we have to make choices among the many plant and animal species that provide us with food, fiber, and other material goods and services. But we would also have to determine which other species are necessary to sustain the lives of the chosen species of direct use to us, such as pollinators, pest controllers, and soil micro-organisms. The difficulties of answering such questions and attempting to construct a replica of the natural systems necessary to sustain life are illustrated by the Biosphere 2 experiment, in which researchers in Arizona were unable to sustain human life within the closed system of the Biosphere for the target two years without resorting to outside interventions (Baskin 207-209).

In order to emphasize the importance of ecosystem services to sustaining human life on the earth some researchers have begun publishing estimates of the monetary or economic values of ecosystem services. For example, in a group of papers collected by Gretchen Daily (1997), a number of biologists, ecologists, and other scientists presented estimates of the monetary values of such ecosystem services as climate regulation, nitrogen fixation, pollination, and waste treatment, among others. In her concluding chapter, Daily warned
against adding up these values to obtain
a grand total “value of nature,” for reasons I will discuss below (Daily 268). But in the same year, two other sets of researchers have published reports that did just that. Costanza et al. (1997), in a widely cited article, estimated that the total value of the world’s ecosystem services was about $33 trillion per year. The types of ecosystem services valued in this study and their contribution to the grand total are shown in Table 1. Shortly after this estimate appeared, Pimentel, et al. (1997) estimated that the total value of biodiversity, by which they meant the value of ecosystem services provided by the array of species presently on earth, was just under $3 trillion per year. Their results are summarized in Table 2. Both sets of authors argued that their estimates were conservative in the sense that the true values were actually much higher because of gaps and omissions in the coverage of their work.

It is interesting to compare these two tables, both the specification of the services to be valued and the numbers obtained. For example, Costanza, et al. estimate values for nutrient cycling (which is by far the most valuable ecosystem service according to them), disturbance regulation, and cultural value (the second most valuable). Pimentel, et al. do not include any of these services in their analysis. On the other hand, Pimentel, et al. estimate values for pollination, eco-tourism, bio-control of pests and nitrogen fixation, none of which is included in the Costanza, et al. analysis. And where the two studies estimate values for the same or similar services, the Costanza,

<table>
<thead>
<tr>
<th>Ecosystem Service</th>
<th>Total Global Value in Billions of Dollars per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrient Cycling</td>
<td>$17,075</td>
</tr>
<tr>
<td>Cultural Value</td>
<td>3,015</td>
</tr>
<tr>
<td>Waste Treatment</td>
<td>2,277</td>
</tr>
<tr>
<td>Disturbance Regulation</td>
<td>1,779</td>
</tr>
<tr>
<td>Water Supply</td>
<td>1,692</td>
</tr>
<tr>
<td>Food Production</td>
<td>1,386</td>
</tr>
<tr>
<td>Gas Regulation (primarily carbon dioxide sink)</td>
<td>1,341</td>
</tr>
<tr>
<td>Water Regulation</td>
<td>1,115</td>
</tr>
<tr>
<td>Recreation</td>
<td>815</td>
</tr>
<tr>
<td>Raw Materials</td>
<td>721</td>
</tr>
<tr>
<td>Climate Regulation</td>
<td>684</td>
</tr>
<tr>
<td>Erosion Control</td>
<td>576</td>
</tr>
<tr>
<td>Biological Control</td>
<td>417</td>
</tr>
<tr>
<td>Habitat/Refugia</td>
<td>124</td>
</tr>
<tr>
<td>Pollination</td>
<td>117</td>
</tr>
<tr>
<td>Genetic Resources</td>
<td>79</td>
</tr>
<tr>
<td>Soil Formation</td>
<td>53</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$35,268</strong></td>
</tr>
</tbody>
</table>
et al. numbers range from 2.5 times (food production and waste treatment and disposal) to 10 times (gas regulation or CO2 sequestration) the values estimated by Pimentel, et al. In fact the aggregate value estimated by Costanza, et al. is an order of magnitude larger than that obtained by Pimentel, et al.

The two sets of authors were clearly aware of each other’s work. Each cites the other’s paper. But they largely rely on different sets of primary sources for their estimates. I am neither surprised nor bothered by the differences in results. I think that this simply demonstrates that the science (or perhaps the art) of ecosystem valuation is still in its infancy and that there is still much work to be done in reaching a consensus on what components of ecosystems functions and services are valuable and what methods and data are appropriate for estimating these values. These two studies looked at together raise some interesting and challenging questions which were part of our discussion during our workshop sessions. These questions are:

- What do we mean by “nature” when we say “value of nature”? or what is it that we are trying to value?
- What do we mean by value? There are several meanings to this term; I will focus my attention on the economic definition of value, which is also the definition implicitly or explicitly adopted by both sets of authors.
Should we attempt to value nature? If so, why?

How do we estimate the values of nature’s services?

And finally, do the Costanza, et al. and Pimentel, et al. studies convey any useful information about the value of nature?

My plan is to discuss each of these questions in turn and attempt to provide answers from the perspective of the discipline of economics. By way of preview, my answer to the last question is “no.” This is so for several reasons:

- These authors have not formulated meaningful questions.
- Some of their estimates rest on a questionable biological or ecological foundation.
- They have used flawed economic methods
- Some of their results are based on flimsy data.

I. THE MEANING OF NATURE

I take nature to mean the collection of all of the ecosystems on earth, that is, all the living organisms, their interactions with each other, and with their physical environments. This is a more all encompassing definition of nature than that presented by Gilfillan (1999). But since we are both focusing our attention on the services to humans, there is no real conflict between these two definitions.

Several authors have addressed the question of whether humans are part of nature or are something apart from nature. For example, McKibben speaks of “nature” as “the separate and wild province, the world apart from man . . . (1989, pp. 48).” But I think that this is a misguided view, at least from an ecological perspective. We are part of nature because we interact with other organisms and with our physical environment. We have impacts on other organisms and they have impacts on us. And this has been so at least to some degree since the emergence of the human species. Also, as Gilfillan (1999) showed, we are not the only species that can have profound impacts on the structure and functioning of our environment. We have this capability in common with, for example, sea otters, African elephants, and a variety of exotic plant species such as purple loosestrife and kudzu.

II. ECONOMIC AND OTHER CONCEPTS OF VALUE

I briefly discuss two concepts of value: intrinsic value and instrumental value. Simon will have more to say on this question in his contribution to this set of papers. I will argue that although the concept of intrinsic value is attractive in many respects, it does
not provide a basis for dealing with the kinds of questions that I will identify below in trying to answer the “Why value nature?” question. The concept of instrumental value and in particular the economic form of intrinsic value is well suited to helping answer these questions.

**INTRINSIC VALUES**

Something has intrinsic value if it is deemed to be “valuable in and of itself, not because of what it can do for us (Callicott, as quoted in MacLean, 1985, p. 11).” Or, “something is of intrinsic value if it is good or desirable in itself (Singer qtd. in MacLean 15).” Some people have argued that nature has intrinsic value for various reasons including because of its “harmony” or its natural balance. But from the perspective of the “new ecology” which emphasizes disturbance and change in ecosystems (Botkin), this view of an intrinsic value in nature is very problematic.

A conservation biologist might argue that the part of nature consisting of the variety of organisms and their interactions and especially their genetic diversity has intrinsic value. I am sympathetic to this view. But this view does not endow any particular manifestation of nature with intrinsic value. Nature’s value is preserved as long as diversity in the broad sense is preserved. This concept of value is not a useful guide to dealing with the kinds of questions I discuss below.

**INSTRUMENTAL VALUES**

Something has instrumental value if it is valued as a means to some other end or purpose (Singer qtd. in McLean 15). In this view, the value of something lies in its contribution to some other goal. In order to assess the instrumental value of nature, it is necessary to specify a goal and to identify the contributions that specific components of nature make toward the furtherance of that goal.

Economics is the study of how societies organize themselves to provide for the sustenance and well-being of their members. Thus in economics, the goal is increased human well-being. And the economic value of something is a measure of its contribution to human well-being. The instrumental economic value of nature resides in the contributions that the variety of ecosystem functions and services makes to human well-being. Ecosystems provide services in the forms of: materials such as food, fiber, and water; the support of human life through the maintenance of an hospitable climate and breathable air; a variety of amenities that enrich our lives and make them more fulfilling; and the decomposition and recycling of at least some of the wastes of human enterprise.

The economic value to an individual of an ecosystem’s service is defined as that individual’s willingness to obtain an increase in the ecosystem’s service. This measure of value can be interpreted as the monetary equivalent of the change in well-being of the affected individual. To obtain the total value of an increase in an ecosystem service flow,
the values to each of the affected individuals are summed. Thus, in economics, ecosystems are valued in terms of their ability to satisfy human needs and preferences.

The value of an ecosystem’s service can be measured, in principle, by using one of two approaches. The first is by observing the choices that people make in their daily lives as they confront opportunities to make trade-offs between more or less of an ecosystem service and something else. The second is by asking them carefully designed and well-structured sets of questions about how they would make these trade-offs in certain circumstances. Most introductory level textbooks in environmental economics contain more detailed descriptions of these two approaches along with examples of their application.3

I must acknowledge that there are some problematic aspects of basing an economic value measure on individuals’ preferences and observations of their behavior. I will mention only two. But an extended discussion of this issue would carry us too far afield. First, individuals may be ignorant about what ecosystems do for them. If individuals are ignorant about the contribution that an ecosystem service makes to their well-being, then their observed behaviors or responses to questions will reflect that ignorance rather than the service’s true value to them. And second, individuals’ choices and responses to valuation questions are constrained by their income or lack thereof. If the distribution of income is deemed unfair or unjust, then the values revealed or expressed by these individuals lose their claim to moral standing.

III. WHY VALUE NATURE IN ECONOMIC TERMS?

I think that the best answer to this question stems from our need to make choices about how to manage the human impact on natural systems. We live in a world of scarcity. This means, among other things, that we can not have all of the desired quantities of all environmental services at the same time. Greater use of one type of environmental service, or greater protection of one type of natural system, comes at the cost of less of something else that matters to us. We face trade-offs and choices. If we are to make the most of our endowment of scarce resources, we must compare what we gain from an activity with what we give up by undertaking that activity rather than something else. And to do this, we need a way of assessing the net impacts of policy changes on human well-being so that we can choose the best mix (in terms of the contribution to human well-being) of service flows from the environment.

There are also other reasons for estimating the economic values of ecosystem services. One is that if we choose to tax pollution on the basis of the damage it causes to us, we need to know not only the direct damage (for example to human health) but also the indirect damage caused by reductions in other environmental service flows. Second, in order to provide incentives for parties
to take better care to prevent adverse environmental effects from such things as oil spills and hazardous waste dumps, we have created a system of legal liability wherein parties are obliged to make payments based on the economic damages their activities have caused. Thus an effective liability system requires estimates of the losses of ecological values caused by the parties responsible for these damages.

And third, some countries have begun to make adjustments to their systems of national income accounts that produce estimates of such things as Gross Domestic Product in order to take into account at least some of the damages that economic activity causes to the environment and ecosystems. There is a variety of such adjustments that might be made. These adjustments are often referred to as “green accounting” and they require estimates of the economic values of changes in the flows of services from ecosystems. For a discussion of green accounting in the context of ecological valuation in, see Peskin (1997).

IV. AN ECONOMIC THEORY OF ECOLOGICAL VALUE

The first point to make is that the kinds of uses to which ecosystem values would be put require what are called *marginal values*, that is, the values attached to relatively small changes in the levels of an ecosystem’s service flow, holding other things constant. This is so for at least three reasons. First, most of the ecosystem changes that we will opt to value for management purposes will be relatively small either in magnitude or spatial scope rather than large changes such as the loss of all pollination or nutrient recycling functions. For example, one might be interested in knowing what is the loss of ecological value associated with a 10% reduction in the water retention capability of a wetland. Or the question might be what is the economic value of the loss of 10% of the wetland area within a larger complex of wetlands and other land forms.

The second reason concerns the way in which economic values are defined. They represent the individual’s willingness to pay for a specified change holding all other things equal, especially the availability of other goods and service that might be substitutes for or complements with the good or service being valued. The bigger an ecosystem change being described, the more these other things are likely to be changing too, making the modeling and valuation tasks much more complicated.

The third reason has to do with the measurement of values. The measurement of the value of an ecosystem service is easier if it can be assumed that the value per unit of the service (which is analogous to a price) is constant. But as the level of a specific service changes, its marginal value is likely to change as well in the opposite direction, that is, as the level of the service flow increases, its value, at the margin, decreases, and vice versa. These changes in marginal value are very important in calculating the total values of environmental services.
Estimating the economic value of an ecosystem service involves three steps. The first is determining the size of the environmental change affecting ecosystem structure and function. The second step involves determining how these changes affect the quantities and qualities of ecosystem service flows to people. The third step involves using existing economic methods where available to assess the changes in people’s well-being, as measured in dollars.

When an ecosystem service supports the production of a marketed commodity, the value of a change in that service is derived from the change in the value of the downstream market activity. Three examples of studies that are based on this principle involve the contribution of tidal wetlands to the commercial harvest of blue crabs and commercial fin fish and impact of improved air quality on agricultural productivity.4

When ecosystem functions support nonmarket environmental services, we can draw on the tool kit of nonmarket valuation methods to determine the economic values of changes in these service flows. For example, when a change in an ecosystem service results in an improvement in the quality of outdoor recreational experiences, travel cost and related models of recreational demand can be used to estimate the value of the service flow.5

There is a large and growing literature containing estimates of values for changes in a wide variety of service flows based on both market and nonmarket valuation methods. For example, the chapter on the economic value of biodiversity in the Global Diversity Assessment has 10 pages of references to this literature (Perrings, et al.). See also the papers in Daily (1997).

V. A CRITIQUE OF COSTANZA, ET AL. AND PIMENTEL, ET AL.

In the Introduction, I said that these authors had not formulated meaningful questions. Implicitly, the grand total value measures of these two sets of authors show how much compensation the inhabitants of the earth would require to maintain current levels of well-being if all ecosystem services were to cease or biodiversity to disappear. Since such a world would no doubt be uninhabitable, there is no amount of money that would compensate for such a change. As one wag put it, all that Costanza, et al. have done is to seriously underestimate infinity (Toman). Furthermore, the simultaneous shut down of all ecosystem services is an unrealistic, if not unobservable, scenario. And finally, any answer to such a question would not inform any meaningful policy question, since as discussed above, policy is made at the margins and requires marginal values.

Costanza, et al. have responded to this criticism of their “total value” measure by arguing that it is an analogue to the GNP measure of economic activity. Both measures are calculated by multiplying a unit value or price of something by a measure of the total
quantity of that thing (an economic output in the case of GDP and an ecological service in the case of the value of the world’s ecosystem services) and adding up these products across all relevant things (Costanza, et al. 1998). Is the analogy valid? I think not, for three reasons.

First, Costanza, et al. called their number a measure of the total value of the output of nature, implying that GDP is a measure of the total value to us of our national output. But GDP is not a measure of the total value of national output. The main reason is that GDP uses current prices as the unit values of all of the goods and services included in it. But as I pointed out above, as the outputs of specific goods decrease, their prices or marginal values would increase. And these increases in marginal value are very important in calculating the welfare values and total values of outputs of goods and services. Also, GDP includes activities that simply mitigate the negative effects associated with some of the other components of output. And GDP does not include important components of national output, for example home production, and the imputed rental income of owner-occupied housing, that should be included in a valid measure of total value.

Second, and more important, GDP is calculated from a system of accounts designed to avoid double counting of outputs by adding up only the value added at each stage of production. For example, the statisticians who calculate GDP do not simply sum the value of output of flour and the output of bread since the latter includes the value of the flour that went into its making. To do so would count the value of the flour twice. Both Costanza, et al. and Pimentel, et al. have double counting in their measures. For example, the value of biological pest control and pollination are calculated separately and added to the value of food production from grass lands and crop land, thus counting the pest control and pollination values twice.

And finally, Costanza, et al.’s and Pimentel, et al.’s comparisons of the value of nature with the value of GDP also involve double counting. This is because many of the components of their measures are also components of GDP itself.

The second basis for critiquing these studies concerns the weak biological or ecological foundations of some of the components of the totals. One example, the basis for the value of biological control presented by Costanza, et al., will suffice. Costanza, et al. provide estimates of the value of biological control for each of the marine biome types and for grass/rangelands and temperate forests. The published article emphasizes the reasons for estimating the values of ecosystem services and discusses the overall result. The details of the data and methods used are contained in an appendix that can be downloaded from the Nature Web Site (www.nature.com). The meaning of the term “biological control” was unclear to me in the context of the Appendix. In the ecology texts that I consulted, the term is used to describe pest control (de Groot 62; Begon, Harper, and Townsend; Ricklefs) and pollination (de Groot 63).
Since it was unclear to me how marine biomes provide pest control and pollination services, I queried the authors. I was told that the term refers to “the regulation of ecosystem structure and function through trophic dynamics” (Karin Limburg, personal communication, July 23, 1998). As Costanza, et al. note in their Table 1, examples of biological control include “Keystone predator control of prey species, [and] reduction of herbivory by top predators.” Given this definition, an example of a valuable biological control function in a marine biome could be the role of sea otters in controlling sea urchin populations and permitting the establishment of kelp forests that serve as food sources and shelter for many marine organisms. This example suggests that the nature of the function and its value are likely to be quite specific to the species involved and to the particular ecosystem.

But it is clear that some forms of “predator control of prey species” could have negative economic values by reducing the flows of economically valuable services from ecosystems. For example, it is said that mature cod prey on immature lobsters in the Gulf of Maine and that the collapse of the cod stock may be a contributing factor in the recent record landings of lobsters. If so, then it is the loss of the biological control function that has positive economic value, at least in the short run.

So their estimate of the economic value of this ecological service rests on an inadequate consideration of the specific predator-prey relationships that matter in these biomes and how changes in these relationships affect the flows of services to people.

As for flawed economic methods, I will discuss two examples here, the use by Costanza, et al. of replacement cost values and the treatment of the costs of using nature’s services. It is often suggested that the cost of replacing a function of an ecological system with a human engineered system can be used as a measure of the economic value of the function itself. In a classic example, Gosselink, Odum, and Pope (1974) used an estimate of the cost of a tertiary sewage treatment as the economic value of the nutrient removal function of a tidal wetland. However, replacement cost can be a valid measure of economic value only if three conditions are met: the human-engineered system must provide services of equivalent quality and magnitude, the human-engineered system must be the least costly alternative, and individuals in aggregate must, in fact, be willing to incur these costs if the natural service were not available (Shabman and Batie, 1978). Note that when these conditions are not met, there is no presumption that replacement cost is either an overestimate or an underestimate of true economic value; all that can be said is that the two numbers are measures of different things.
When replacement costs are used as the basis for valuation, authors should attempt to make a showing that it is reasonable to believe that these conditions are met or at least that they are not wildly implausible. Costanza, et al. used replacement cost to estimate values for nutrient cycling in marine ecosystems which is about 46% of the grand total and both sets of authors used it for treatment of organic wastes. Neither made any effort to establish that the above conditions are satisfied. Given the importance of these services in the grand totals, this question deserves some attention.

Nutrient cycling refers to the ongoing processes of uptake of inorganic nutrients by plants, their passage along the food chain, and their ultimate conversion back to inorganic form by decomposers, detritivors, and various physical processes. Costanza, et al. focus on the two primary nutrients, nitrogen and phosphorus, and assume that the ocean waters are serving as sinks for these elements. They say, “If the oceans were not there, we would have to recreate this function by removing N and P from land runoff and recycling it back to the land” (Notes 2), and they estimate the cost of doing this to be equal to the cost of advanced municipal wastewater treatments of sufficient size to handle the required flow.\footnote{7}

What would be the consequences for human welfare of not doing this? Would we be willing to spend $17 trillion to send all of the runoff from land through waste water treatment systems in order to remove these nutrients? Costanza, et al. do not address this question. If the oceans existed but were devoid of life, nutrients would accumulate in the water and/or settle out to the bottom; but with no life in the oceans, it is difficult to see what the further adverse consequences of this to human welfare would be and why we would be willing to spend huge sums to prevent it. This is not to deny that there can be problems associated with excess nutrients in our oceans and estuaries. See, for example Malakoff (1998). But the proper approach to valuing these impacts is to estimate the economic values of the other ecosystem services that are impaired because of the nutrient imbalances.

The second methodological flaw concerns the treatment of the costs of using nature’s services and the difference between gross and net value. A basic concept in resource economics is rent, where rent is defined as the total value of the flow of a good or service from the environment less the cost of harvest or extraction. For small changes in the level of the service flow (so that price or unit value can be taken as constant), rent is a measure of nature’s contribution to the total value of the flow. Similarly, harvest or extraction cost represents the contribution to total value made by the labor, capital, etc. used in extracting or harvesting the flow.

Costanza, et al. recognize this point in their discussion of Figure 1 (257) and in their calculations of the values of food and raw materials from Forests and Grass/Range-
lands. But they are inconsistent in their application of this principle. Specifically, for food
production from marine biomes, they use the landed value of the harvest, which in-
cludes harvest costs to arrive at their estimate of value of about $0.8 trillion (about 2%
of the total). Since most of the ocean fisheries are open access and are not being effec-
tively managed, economic theory predicts overcapitalization and dissipation of rent.
Thus one could argue that a better estimate of net economic value would be zero.
Actually, many of the world’s fisheries receive substantial subsidies from misguided
governments. The Food and Agricultural Organization has estimated that in 1989 the
actual cost of the harvest exceeded the landed value by $54 billion, largely because of
subsidies (Food and Agricultural Organization, 1993 as cited in Myers, 1998). Account-
ing for these subsidies would result in a negative realized value for the oceans’ food
production services under current management and policy.

Finally, a number of examples of flimsy data and poor documentation in the
Costanza, et al analysis are available from the author.

VI. CONCLUSIONS

How much is nature worth? Or more accurately, how much are ecosystem services
worth? A lot! Ecosystems are very valuable because they provide a wide array of services
that enhance our well-being. The Costanza, et al. and Pimentel, et al. estimates are useful
in that they call attention to this fact. But that is as far as I am willing to go in finding
usefulness in these studies.

Estimates of values of changes in ecosystem service flows are very important to
help us make better decisions about managing the impacts of human activities
on ecosystems. But neither Costanza, et al.’s nor Pimentel, et al.’s numerical
estimates of value can be taken seriously. Neither group has posed a meaning-
ful valuation question because they have both posed a poorly defined (to be
charitable) or meaningless hypothetical alternative, that is, a world with no
species or no ecosystems. Furthermore in calculating their estimates of various
components of their total values, they have engaged in double counting, used
seriously flawed methods, and relied on flimsy data. The Costanza, et al. paper
received a lot of favorable attention in the national media and has been wel-
comed by many people in the natural sciences. See, for example, the commen-
tary by Stuart Pimm that accompanied the published article. I have to believe
that many people fancied the shiny paint job but never looked under the hood
to see how the drive train was put together.

Finally, I think that we will never be able to say how much nature is worth.
But it is within our grasp to provide estimates of how much changes in specific ecosys-
tem services are worth to us. And this is the kind of information we need to make wise
choices about managing and protecting the sources of these service flows. The efforts to obtain such estimates are creating exciting opportunities for interdisciplinary research involving economists, ecologists, and others. It is vitally important that this research make use of sound economic methods and also that it be based on the best possible understanding of how ecosystems work and what the world would be like if various ecosystem services and functions were to be seriously impaired or even eliminated.

NOTES

1. See, for example, Constanza and Folke, 1997, p. 49.

2. Alternatively, it could be defined as the individual’s willingness to accept compensation to agree to a decline in the level of the ecosystem’s service.

3. See, for example, Field (1997) or Tietenberg (1999).

4. For further discussion and citations, see Freeman (1997).

5. See Freeman (1993) for a description of these methods. See Freeman (1997) for examples and additional references.

6. For a similar but more brief discussion of these problems in the Pimentel, et al. analysis, see Freeman (1998).

7. “Notes” refers to the Notes to Table 2 in the Appendix that was available on the Nature web page.
WORKS CITED


— “Costanza and His Co-authors Reply.” *Environment* 40.2


Recent attempts to place an economic value on ecosystem services have led to a lively debate about whether those services in nature that impact and affect human well-being can be given a monetary value and, if so, then how that value should be determined.¹ The exercise in “valuing nature” has grown out of a concern that current behaviors and practices, both economic and non-economic, are threatening the global environment. The debate has raised questions about what we mean by nature, and what we mean by value.² It has also raised questions about ecological consciousness, and whether that consciousness should combine concerns about human welfare with concerns about ecosystem integrity.³

Since our current environmental situation is the result of a long process of human interaction with nature, a historical perspective ought to be critical to the discussion.⁴ As we try to assess current values of nature, we would do well to try to understand the cultural precedents of those values. How did previous cultures perceive nature—as an integrated ecosystem, as a collection of diverse settings (e.g., the coast, hill and mountain regions, woods and forests, and watercourses), or as a collection of its various natural products—animal, vegetable, and mineral? Did past conceptions of nature emphasize its instrumental value—in particular, how nature contributed to human welfare—or was there some conception of intrinsic value where nature had value in and of itself? Were nature’s resources conceived of as infinite or finite?
An explicitly historical perspective is also critical because numerous scholars from other disciplines have offered an implicit historical perspective in their assessments of the past, present, and future. Scholars offering a social critique of our current relationship with nature characterize it as disruptive, and compare it to a past condition, long ago, when human beings lived in better harmony with nature, and when nature existed in a “natural state.” Edward O. Wilson compares the present tendency of human beings to remove themselves from the natural environment with the relationship between humans and nature in the “period of deep history” when survival “depended on an exact learned knowledge of crucial aspects of natural history.” But he doesn’t locate or characterize those changes in humanity’s relationship to the natural environment according to either era or place. Similarly, David W. Orr argues that, “Compared to earlier cultures, our distinction lies in the fact that technology now allows us to move much further toward total domination of nature than ever before.” But he doesn’t support his claims about the “ecological innocence” of primitive cultures, nor does he specify which earlier cultures or when. He is also vague about both the timing and the content of the process of modernization—a kind of slow tectonic shift in perception and attitudes that widened throughout the Middle Ages to the present—which separated those cultures from the present. Imprecise, nostalgic, romantic, mythical, and otherwise inaccurate assumptions about the past, and vague descriptions of the process of change over a long historical period, may well lead to incorrect assessments about the current impact of human beings on nature and to problematic models for future use.

During the last three decades, environmental historians have been documenting and analyzing the ecological impact of European agricultural practices and natural resource use on the North American environment. In examining both the similarities and the contrasts between the environmental perspectives of Native Americans and Euro-Americans, they have challenged the simple dichotomy of a culture that lived in harmony with nature and a culture that disrupted the natural environment. They have explored the ways in which Euro-Americans in the past have engaged in what Carolyn Merchant describes as “ecological thinking” by which they “construct[ed] nature as an active partner.” If we can understand how current behaviors and interactions with nature, views about nature, and values of nature have been shaped by deeply imbedded cultural values and systems, we can begin to address the current social and cultural obstacles to ecological consciousness.

In *Changes in the Land: Indians, Colonists, and the Ecology of New England*, William Cronon set out, in part, to answer a question that Henry David Thoreau posed in his journal in 1856: “Is it not a maimed and imperfect nature that I am conversant with?” In his 1983 study, Cronon asks, “how did the ‘nature’ of New England change with the coming of the Europeans,” and “whether we can reasonably speak of its changes in terms of maiming and imperfection?” His questions might be asked in a different way. Rather than explore the environmental and cultural means by which the landscape was altered, this essay seeks to compare and contrast the manner in which travelers and settlers, during two eras of American history, wrote about the “New World” or the “new coun-
try” that they encountered first in seventeenth-century New England and then in the upper Midwest during the first half of the nineteenth century. It examines how they viewed, perceived, described, and valued the “natural state” of their new environment. It suggests the implicit economic values and priorities that they placed on natural resources. And it examines how travelers understood, assessed, and valued the changes in their environment that accompanied European settlement.

The evidence from the reports and accounts of seven seventeenth-century English explorers and early settlers in New England and from the retrospective accounts of 82 early nineteenth-century pioneers to the frontier Midwest suggest that travelers and settlers in both eras based their priorities, conceptions, and values of nature on their particular experiences of scarcity and on European standards of civilization and improvement. Explorers, settlers, and travelers were intent primarily on evaluating the potential resources that the new land could offer and determining which ecological communities would best support their endeavors. Over time, some observers gained an aesthetic appreciation of nature as a landscape. Time also brought to some inquirers the beginning of a concern about the deleterious impact on the environment of concerted efforts to settle and improve the land. But across time and space, Euro-Americans concentrated their environmental focus on the instrumental value of nature and they praised practices that supported and benefited human welfare. Although settlers who attempted to live in the new environments either of seventeenth-century New England or the early nineteenth-century Midwest may have had some sense of the value of the “services” that “nature” offered, they had little conception of the ecosystems that provided those services.

The lens through which travelers viewed the landscape they encountered was clearly shaped by their particular economic and cultural perspectives. In the wake of the sixteenth-century resource crisis of land, food, and fuel, enterprising Europeans looked to the New World for natural resources that were scarce in Europe. A number of seventeenth-century English explorers and early settlers in New England published reports about the New World that attempted to persuade potential financial investors and colonists to participate in exploration and colonization ventures. Anticipating challenges to the accuracy of their accounts, most of the chroniclers took pains to assert that their accounts were based on direct, personal observation. Christopher Levett, who explored the coast of Maine in 1623-4, asserted of his account, “I will not ... speak more than is true. I will not tell you that you may smell the corn-fields before you see the land; neither must men think that corn doth grow naturally, (nor on trees), nor will the deer come when they are called ...” Most seventeenth-century accounts offered general descriptions of the land—the terrain, the soil, the woods, and the native inhabitants. In a few portrayals of the “wilderness,” authors included “fantastical” tales that they had heard about the new world. Their primary focus, however, was on the natural products of the environment; they most highly valued the bounty of “merchantable commodities” that the land offered and that Europe lacked.
When early seventeenth-century explorers and settlers in New England offered their accounts of the New World, they did not characterize the whole as “nature.” In the early seventeenth century, “nature” referred to the essential qualities or properties of a thing. It did not begin to refer to the material world, or its collective objects and phenomena, until the late seventeenth century. Even then, viewed as the features and the products of the earth itself, nature was seen in inferior contrast to the products and resources of civilization. Or it was seen as uncultivated or undomesticated, again in contrast to a preferred standard of cultivation and domestication.17

To some extent, the early settlers did not need a term like “nature” when they described the New World. By relying on either vague or pejorative conceptions, they tended to devalue the whole and suggested either implicitly or explicitly that its potential would be realized only after it was put to good use. In 1622, Mourt’s Relation simply designated the area around Plymouth as “the land.” Christopher Levett referred to the coast of Maine in 1623 as “the country” or “this place.”18 When other writers characterized the land that they explored and settled, they usually described it as a “wilderness”—suggesting a wild, uncultivated, desolate land which also implied waste.19 In some cases, they offered additional descriptions: “desart Wilderness,” “howling desart,” “this yet untitled wilderness,” “the vast and desolate wilderness,” “a vast and empty chaos.”20 Undoubtedly, some Puritans chose the term wilderness because of its religious connotation, which suggested a wild region in which one wanders and loses ones way.21 The advantage to the perception of nature as a wilderness was that nature seemed to require “improvement.”

Rather than focusing their accounts on a encompassing view of the new land, explorers and early settlers devoted most of their descriptions to the natural harbors along the coast, the good ground fit for planting and pasture, and to the great variety of resources available in the salt marshes along the coast and in the hardwood forests of the eastern woodlands. They presented these in measures of quantity: “much good timber,” “great abundance,” “great quantity,” “giant store,” “good store.”22 They indicated what they saw as the particular use of each resource: “fowl enough for killing, wood enough for felling, good fresh water enough for drinking... divers other wholesome herbs, both for profit and pleasure.”23 Although the explorers’ accounts especially emphasized the “merchantable commodities” that were scarce in England, all of the accounts broadly described the variety of resources available to support their colonies.

The view of natural resources as commodities, and the emphasis on abundance and “good store” represents a Eurocentric perspective: they viewed the land with what Joel Martin calls “the gaze of development,” which he defines as “that cultural and economic grid and logic through which Anglo-Americans unrelentingly processed all land.”24 As Cronon argues, explorers with a commodities orientation “treated members of an ecosystem as isolated and extractable units.”25 Their gaze did not detect the ecological relationships among the natural elements both within and between the various ecological communities. Their cautions about the availability of natural resources came only in the form of warnings that careful planning, sufficient financial investment, and diligent hard
work were essential to derive benefit from the land. Their perspective and values were shaped by the scarcity of European resources—natural, human (hard-working labor), and economic (capital). But they did not voice concerns about the possibility of limited supplies of natural resources in the new world.

Seventeenth-century settlers expressed little or no concern about preserving the environment in its “natural state,” perhaps in part because they knew that the “wilderness” that they encountered was neither uninhabited nor untouched by human beings. Even the earliest explorers in New England described various Native American practices which had altered the landscape. William Wood explained that Native Americans had cleared many acres of land, and they cleared many of the forests of underbrush: “for it being the custome of the Indians to burne the wood in November, when the grasse is withered, and leaves dried, it consumes all the underwood and rubbish, which otherwise would over grow the Country ... by this means in those places where the Indians inhabit, there is scarce a bush or bramble, or any combersome underwood to bee seene in the more champion ground.” Their accounts of the impact of Native American practices provided a model for assessing (and approving of) their own transformations of the new environment without questioning the consequences of their actions for the natural world.

Most of the colonists’ accounts favorably described the changes in the land that accompanied clearing and settling. They characterized their efforts as the improvements and progress that accompanied civilization, in contrast to the waste of the land prior to the arrival of the Europeans. Mourt’s Relation of Plymouth explained, “The country wanteth only industrious men to employ, for it would grieve your hearts if ... you had seen so many miles together by goodly rivers uninhabited.” In 1622, Robert Cushman similarly believed that the land at Plymouth would only benefit under European tending: “[the Indians’] land is spacious and void ... They are not industrious, neither have art, science, skill or faculty to use either the land or the commodities of it, but all spoils, rots, and is marred for want of manuring, gathering, ordering, etc. .... land lay idle and waste.” In the colonists’ assessments, both their methods and their labor were more fruitful than that of Native Americans. Edward Johnson of Massachusetts Bay suggested in 1654 that the land, as God’s domain, had been waiting for the Europeans: “[T]his remote, rocky, barren, bush, wild-woody wilderness ... a place that never afforded the Natives better [than] the flesh of a few wild creatures and parch’t Indian corn ..., now through the mercy of Christ [has] becom a second England for fertillness in so short a space, that it is indeed the wonder of the world.” Valuing civilization over wilderness, they praised the improvements they had made on the land, and offered little or no critical assessment of the consequences to the environment of their use of the land or its resources.

As settlement and civilization progressed, some travelers and colonists began to describe a landscape when they wrote about their environment. As John Stilgoe explains, landscape in seventeenth-century England referred to a “natural or rural view” which revealed an extensive, cultivated expanse—a “knowable space”—rather than the chaos of the wilderness. In 1673, John Josselin published an account of two voyages that he
made to New England. As previous accounts had done, he described the various aspects of the country—its terrain, harbors, soil, trees, and springs—that would be of particular interest to the English. But, as he sailed from Massachusetts to Maine in 1663, he also described the vista of the Piscataqua river and region. He commented on the river and harbor, and the “fair houses” on the west side of the harbor, and he explained that, “higher up the River, the Riverbanks are clothed with stately Timber, and here are two miles meadow land and arable enough.” Completing this section of his travelogue, he then noted, “having pleased ourselves with the sight of Piscataway at a distance we sailed on.” The order that settlers had created with their farms and their colony had created a pleasing sight for Josselin’s gaze—a measurable appreciation that confrontations with the wilderness had rarely produced.

Taken together, seventeenth-century Anglo-Americans’ accounts of the New World suggested relative “values” in their descriptions of the natural resources that the land offered, placing a premium on the abundant resources that were scarce in Europe, and on the human labor and financial resources required to extract and gather those “merchantable commodities.” Those values were implicitly, if not explicitly, quantitative. In relative terms, they devalued the whole, at least in its “natural state,” perhaps because they had no conceptual means of seeing the whole as an ecosystem. Their measures of abundance also suggested that they viewed the quantities of those resources as potentially limitless; such supplies further supported their beliefs that the “commodities” were theirs for the taking, and that there was little reason to consider the environmental impact of their behavior. By viewing nature as a wilderness, apart from civilization and therefore with little or no intrinsic value, they assured their readers, and themselves, that they were improving the land and its instrumental value by settling it.

By the end of the eighteenth century, much of the land on the eastern seaboard had been transformed by 200 years of cultivation and improvement from a wilderness to a civilization. In his autumn travels through New England between 1796 and 1807, Timothy Dwight took careful notice of both the “scenes of nature” and the settlements that he encountered. In the introduction to his Travels in New England and New York, he explained his perspective and his purpose: “In a number of instances I have delineated the scenery, which presented itself to me in my excursions.... Not a small number of readers are delighted with landscapes.... The beautiful and magnificent scenes of nature are generally delightful to the human mind; and therefore have an obvious claim to the attention of a traveler.” In his account, Dwight applied a particular aesthetic standard to his measures of nature and landscapes; by his standard, much of nature fell short. On his approach to the Piscataqua Bridge in 1796, he noted, “The face of the country for the first eleven or twelve miles is a beautiful interchange of small hills and valleys, strongly resembling those of North Andover. The road is good, the scenery pleasant, and the soil rich.” His approval did not last: “The remainder of the distance to the
bridge is principally an unanimated and barren plain, where, except some distant mountains, there was scarcely an object to invite the eye of a traveler. We were however abundantly paid for this interval of dullness by the appearance of the bridge.”

Dwight appreciated order in the landscape, the promise of fruitfulness on the land, and heroic and grand structures, both natural and manmade. But dull, barren, cold, unanimated scenes of nature—each an ecological community within the ecosystem—held no interest for him. His standards were those of order and civilization. As the seventeenth-century explorers and travelers had done, he praised “the colonization of a wilderness by civilized men,” and proclaimed that “the conversion of the wilderness into a desirable residence for man is an object, which no intelligent spectator can behold without being strongly interested in such a combination of enterprise, patience, and perseverance.”

The travels that Yankee pioneers made as they ventured to the frontier Midwest in the years after the Revolution bore little resemblance to Dwight’s excursions through New England—their destination beyond New England and the Mid-Atlantic was an environment both unsettled and undeveloped by Euro-Americans. Yet their retrospective perceptions of nature and its landscapes on the frontier were shaped by values similar to those that Dwight expressed. And, similar to the seventeenth-century travelers, their values were based in part on their assessments of scarce resources along the eastern seaboard—in particular, available fertile land and the opportunity to begin anew. A number of later pioneers explained that “the Western fever” had beckoned them, their fathers, or their husbands to the new country in the years between 1820 and the 1850s. They described the lure of the “West” as the opportunity “to grow up with the country,” or to be “in the possession of countless acres in the far west, waving with golden wheat and corn produced almost without labor.” They explained that the West held out the promise of cheap and “undeveloped” land, and even the possibility of unlimited wealth.

Very few of the pioneer reminiscences specifically mentioned “nature,” and none of the descriptions of nature even remotely suggested an ecosystem. James Finley, who came to Kentucky in 1784, personified “Nature” and equated nature with the wilderness: “in the woods—‘the grand old woods,’ where Nature had erected her throne, and where she swayed her scepter. Alone in the deep solitude of the wilderness man can commune with himself and Nature and her God.” William Whirry described Wisconsin in 1846 “as nothing but a vast extent of beautiful, boundless country, just as nature had fashioned it.” He further suggested that nature had fashioned it to be possessed: “and the first settler might have exclaimed, “I am monarch of all I survey.” Caroline Kirkland offered numerous aesthetic descriptions of the “landscape” in frontier Michigan in the late 1830s, but even she stressed the importance of a human presence: “A landscape, however true its outline, however correct its coloring, is only a study for the artist, unless something human appear in the foreground to give an air of life to the scene.”

Without naming the landscape as “nature,” some pioneer accounts, in an attempt to help their readers visualize the new land, described the “appearance of the country.” One
asked, “What was the appearance of the country at that time? ... I will answer—romantic.”45 Another noted, “It would be difficult here to give the present generation a faint idea of the virgin beauty of the west ...”46 The glowing, romanticized descriptions in some accounts contrasted with less enthusiastic if more specific ones in others: “This was my first introduction to a real prairie, and I must say I was sorely disappointed. Your father had talked so much about their beauty ... [I] did not say I never saw anything more dismal.”47 Perhaps the hardship of the pioneers’ experience on the land helps to explain the absence of an appreciation of nature in so many of their recollections. Account after account focused on the costs of settlement in terms of human labor, rather than environmental costs. They reiterated the toil, trials, difficulties, and privations—the arduous work of breaking the prairie sod and clearing the forests. An aesthetic appreciation may require more leisure than most of them ever gained. And their struggle to prevail over some of the obstacles and hindrances of their new environment—the gnarled, three-inch thick red roots, the furious autumnal prairie fires, the swarms of mosquitoes, the howling wild beasts—might explain the lack of concern, in most accounts, about preserving and protecting their environment.

The pioneer accounts described the “natural state” of the new country in a variety of ways: the wilderness, the wild, the back woods, the woods, the forest, an unbroken forest, the wooded country, the timber, the timberland, the prairie, the “virgin soil,” and “land as yet unclaimed.”48 Although some of their terms actually characterized particular ecological communities, most accounts described these from the pioneers’ vantage point, noting how the different settings affected decisions about the settlement of the land. They explained that the early settlers located their farms and homesteads near the edge of the prairies, and in the “timber”—the wood growing along the margin of streams. They wanted to be near “running water” and “away from the [mosquito] ponds of the prairies,” and they discovered that it was easier to clear the thinly-spaced trees in the timber than to break the prairie sod.49

The nineteenth century Midwestern pioneers either lived or wrote during the era when Thoreau voiced his concerns about the waste and extermination of nature and the wilderness, and when George Perkins Marsh, in an early consideration of what we would now call ecosystem services, offered a challenge to the long-held assumption that “American’s resources (or the world’s) were infinite.”50 But, unlike their more ecologically-conscious contemporaries, most pioneers narrowed the environmental focus of their accounts to the considerable diversity of wild resources that the new country “offered” without considering how the environment supported that diversity.51 As seventeenth-century New England settlers had done, nineteenth-century Midwestern pioneers measured and valued those products in quantitative terms that suggested an infinite supply of resources. The prairies, forests, and rivers “abounded” with wild foods, or offered an “abundant supply” of game, birds, fish, fruit, and berries. They described the land as “well stocked,” as if its purpose was to serve them. Even the least eloquent accounts emphasized the numerous, plentiful quantities of wild foods.52
When they detailed the abundance of wild foods, most of the nineteenth-century pioneers implicitly, and some more explicitly, indicated that the “natural” abundance characterized the “early days” of settlement, and that once plentiful supplies, especially of wild animals, were now diminished or depleted. Their retrospective accounts explained: “The wild animals had been principally exterminated.” \(^{53}\) “Notwithstanding their numerous destroyers, the woods were alive with deer, turkeys, pheasants, and squirrels.” \(^{54}\) “In those days bears, deer, raccoons, and wild pigeons abounded... but alas! man’s greed has exterminated the wild pigeons.” \(^{55}\) Still most accounts did not bemoan the decline and depletion of “natural” resources. Once fields were cleared and in production, Midwesterners began to rely, as they had all along intended, on agricultural crops and animal husbandry in place of the wild foods that had sustained the pioneers in the first years. They believed that the “self-sufficiency” which accompanied settlement, rather than environmental integrity, was the best guarantee of human welfare.

Many Midwesterners commented on the changes that had occurred in their new environment. Often they characterized these changes as “the progress in improvements and prosperity,” or explained that “The face of the country has undergone a wonderful change in appearance, aside from the great improvements that have been made.” \(^{56}\) As they experienced and witnessed the changes in their environment, some pioneer accounts detailed ecological changes that had occurred in the wake of that progress. Harvey Ross explained of Illinois in the 1820s, “There is one thing that has altered the looks of the country very much since it was first settled, and that is the extensive growth of young timber and brush, unknown in pioneer times. Before the country was settled by white people, prairie fires were permitted to sweep through the country every year, and they destroyed what is now called ‘barrens’ and underbrush.... The groves were very beautiful before any of the timber had been cut, and before there was any undergrowth.” \(^{57}\) And Charles Coffin explained of Indiana, also in the 1820s, “The streams were nearly double the size that they are at present ....The clearing up of the country has caused great change in this respect and reduced the size of the streams most of the year, but causes them to swell very largely during freshets and heavy rains.” \(^{58}\) Although their descriptions implicitly raised questions about some of the costs of improvement, most commentators neither criticized nor challenged the progress they had made.

A very few pioneer accounts explicitly voiced more serious concerns about the unintended consequences of their efforts to settle and transform the environment. Two accounts, describing the dramatic depletion of the forests, countered the usually unqualified praise for the “improvements” that settlers had made to their environment and offered conceptual frameworks that suggested the beginning of an ecological consciousness. In 1903, David Turpie suggested that the forestry practices of Indiana pioneers in the 1830s had unanticipated future costs: “The wild fruits, flowers and nuts which we gathered all had their being and growth in the forest and many of them have disappeared with it. The forest ... was the dominant physical phenomenon in our lives.... Yet we labored day after day to destroy it. These noble trees, centuries old, standing erect as marble columns ... were treated as enemies.... In many cases, if even a portion of the
growing timber had been saved from the ax, it would have been worth, in a few decades, more than the land on which it stood. This is not, however, the only instance in which supposed present necessities have frustrated the greater gains of the future. As early as 1842, Caroline Kirkland questioned and indeed challenged the values of nature that settlers expressed through their practices: “The Western settler looks upon [the fine remnants of the original forest], as ‘heavy timber,’—nothing more. He sees in them only obstacles which must be removed, at whatever sacrifice.... The very notion of advancement, of civilization, of prosperity, seems inseparably connected with the total extirpation of the forest.” Although other pioneers witnessed the waste and depletion of certain natural resources, and understood the consequences to the land of certain settlement practices, they tended to believe that the “improvements” in the land provided sufficient compensation for the losses.

Between 1846 and 1857, Henry David Thoreau made three journeys through the Maine Woods. In his accounts of these trips, he expressed profound concerns about the waste and in some cases extermination of once-plentiful natural resources in the Maine woods. His experiences persuaded him that neither the lumber industry nor individual hunters intended fully to utilize the timber they cut down or the game that they killed, and in his journeys he searched in vain for the white-pine—the martyr in the “war against the pines.” He commented on the unintended consequences of certain practices, such as the transformative and destructive effects of loggers’ dams on the forests and the shores of the rivers: “thus turning the forces of nature against herself, that they might float their spoils out of the country.”

As Thoreau bemoaned the impact of human interference on nature, he expressed an appreciation for the wildness of nature—“the dense gloom of the forest,” “the most wild and desolate region we had camped in.” His appreciation contrasted with the pioneers’ evaluations of the wilderness and with Dwight’s more civilized aesthetic values—at least to some extent. In admiration, Thoreau explained, “Perhaps I most fully realized that this was primeval, untamed, and forever untamable Nature, or whatever else men call it, while coming down this part of the mountain.” Yet, his perspective was still shaped by the same cultural lens through which Dwight had viewed nature. Thoreau considered some of the cultural assumptions that shaped his experience of his encounters with nature: “Generally speaking, a howling wilderness does not howl: it is the imagination of the traveler that does the howling.”

According to Cronon, a gradual shift began to occur in Anglo-American perceptions of the wilderness during the mid-eighteenth century. Anglo-Americans began to view the wilderness not as a desolate place without God, but as a sublime landscape—one of those “rare places on earth where one had more chance than elsewhere to glimpse the face of God.” In many ways, Thoreau experienced the Maine woods as such a sublime landscape. Yet Cronon also argues that Thoreau’s reactions to that wilderness were
nonetheless “ambivalent.” He respected nature—“There is a higher law affecting our
relation to pines as well as to men.... Every creature is better alive than dead, men and
moose and pine-trees, and he who understands it aright will rather preserve its life than
destroy it.” And he expressed concerns about the significant impact of human beings
on nature: “No one has yet described for me the difference between that wild forest
which once occupied our oldest townships, and the tame one which I find there to-day.
It is a difference which would be worth attending to. The civilized man not only clears
the land permanently to a great extent, and cultivates open fields, but he tames and
cultivates to a certain extent the forest itself. By his mere presence, almost, he changes
the nature of the trees as no other creature does.” Yet, Thoreau still conceived of
nature not as an ecosystem but as an untamed wilderness that existed in contrast with or
in opposition to civilization. At the end of his second trip, he noted, “Nevertheless, it
was a relief to get back to our smooth, but still varied landscape. For a permanent
residence, it seemed to me that there could be no comparison between this and the
wilderness, necessary as the latter is for a resource and a background, a raw material of
all our civilization.”

Even the most ecologically sensitive travelers in the nineteenth century still viewed
nature from a Euro-centric perspective; they viewed it in contrast to civilization, and
primarily as a provider of resources for that civilization. If some mid-nineteenth century
Americans had begun to recognize that their efforts to domesticate, cultivate, and order
the land had permanently altered the environment, most of their assessments of ecological
consequences were conceived in terms of direct cause and effect: excessive lumbering
depletes the forest; overhunting exterminates wild game. They were far less able to
perceive the complex interconnections between the wide diversity of elements that made
up their ecosystem. Long-held cultural assumptions about the wilderness, natural re-
sources, and the landscape were barriers to viewing nature as an ecosystem.

The current debate about valuing ecosystem services hinges in part on whether we can
realistically calculate the annual economic value of ecosystem services. Scholars on both
sides of the debate might do well to remember that nature has long been both valued
and devalued. The history of human interaction with and impact on nature has been
shaped by a host of culturally-imbedded values that determined how the land and its
resources would be used. As different societies pursued the various resources and oppor-
tunities that the environment offered, they altered nature intentionally by cultivating and
domesticating it and unintentionally by wasting and polluting it. A historical perspective
reminds us that the decisions that we make and have made about ecosystems imply
valuations, whether or not these are specifically expressed in economic terms.

The past relationships between human beings and their environment are more complex
than we readily acknowledge. And past constructions of values and visions of nature are
equally complex. Euro-Americans have long valued the resources and products of
nature—its instrumental value—and they believed that those were enhanced by altering and improving nature. As Cronon argues, “what we care most about in nature is its meaning for human beings.... Human interests and conflicts create values in nature that in turn provide the moral center for our stories.” That perception makes it difficult for us to comprehend the concept of an ecosystem. Throughout history, some observers offered glimmerings of an understanding that nature’s resources are finite, and that certain human practices threaten not only the quantity but the existence of those resources. The seventeenth-century New World explorers knew that the Old World was running out of wood for housing and fuel. Progressive agriculturalists in the late eighteenth and nineteenth centuries described the deterioration of land caused by “overcropping,” and other informed contemporaries attributed the decline in wild animals to extensive deforestation. But the “gaze of development” has had a long and powerful hold on the Euro-American consciousness that is not easily dislodged by an ecological consciousness.

Historically, societies either lacked the conceptual or scientific means to comprehend their environment as an ecosystem or they were disinclined to do so. Either perspective underscores the problem of not “valuing nature.” The world’s population continues to focus on the trees (the timber) rather than the forest (the ecosystem). The exercise of valuing ecosystem services may continue to force us to look at the forest. Or maybe we just need to look at the trees in a different way. While regretting the waste of the forest that “clearing” produced, Caroline Kirkland wryly noted, “Yet the felling of a great tree has something of the sublime in it... When the axe first falls on the trunk of a stately oak laden with the green wealth of a century ... the contrast between the puny instrument and the gigantic result to be accomplished approaches the ridiculous.”
NOTES

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Ecosystem services can impact human beings either directly or indirectly. Robert Costanza, et al., argue that ecosystem services should be quantified in terms comparable with economic services and manufactured capital. They estimate the current economic value of 17 ecosystem services for the entire biosphere at US$33 trillion per year. See Costanza, et al., “The value of the world’s ecosystem services and natural capital,” Nature 387.15 (1997), 253-260. Other scholars argue that ecosystem services should be valued “at the margin”—the value of incremental changes—rather than in terms of their full value. According to Nancy E. Bockstael, et al., “Economists ‘value’ things only in comparative terms. When they say they are valuing a change, economists are really defining a trade-off between two situations.” See Bockstael, et al., “On Valuing Nature,” Typescript (January 14, 1998), 3.

For example, David Pearce argues that “people’s preferences should play a large role in determining how the economy’s resources are allocated” and that “Consumers’ preferences ... are indicated by their willingness to pay.” See Pearce, “Auditing the Earth: The Value of the World’s Ecosystem Services and Natural Capital,” Environment 40.2 (1998), 24.


History is not automatically included among the necessary disciplines in environmental and ecological studies. For example, David W. Orr cites Lewis Mumford who proposed the local community and region as the “backbone of a drastically revised method of study” and recommended an integration of various disciplines that would include surveys of local soils, climate, vegetation, history, economy and society. But when Orr proposes the components for a curriculum in the ecological design arts—“the set of perceptual and analytic abilities, ecological wisdom, and practical wherewithal essential to making things that fit in a world governed by the laws of ecology and thermodynamics”—he omits history in an otherwise extensive curricular and research list. See Orr, “Love it or Lose It: The Coming Biophilia Revolution,” in Stephen R. Kellert and Edward O. Wilson, eds., The Biophilia Hypothesis (Washington D.C.: 1993), 433-434.

Edward O. Wilson, “Biophilia and the Conservation Ethic,” 32.


Ibid., 417.

Harold A. Mooney and Paul R. Ehrlich offer a long historical perspective that is similarly problematic: “While explicit recognition of ecosystem services is a relatively new phenomenon, the notion that natural ecosystems help to support society probably traces back to the time when our ancestors were first able to have notions.” From that “historical” statement, they jump to 1864 to find the origins of modern concern for ecosystem services. In that year, George Perkins Marsh offered the first challenge to the idea that “America’s resources (or the world’s) were infinite.” Mooney and Ehrlich place Marsh’s argument in a historical vacuum, suggesting that there was no prior understanding of nature’s finite resources, and then switch quickly to Aldo Leopold who, in 1949, “recognized the basic impossibility of substituting satisfactorily for ecosystem services.” See Mooney and Ehrlich, “Ecosystem Services: A Fragmentary History,” in Gretchen C. Daily, ed., Nature’s Services: Societal Dependence on Natural Ecosystems (Washington, D.C.: 1997), 11, 12.


Donald Worster acknowledges the importance of examining culture, but insists “No landscape is completely cultural; all landscapes are the result of interactions between nature and culture ... environmental history is more than social or cultural history, though ... we should never assume that either nature or culture is an altogether seamless whole.” See Worster, “Seeing Beyond Culture,” Journal of American History 76.4 (1990), 1144.


Cronon argues that “Settlers who had actually to live in a new world environment were less likely than their merchant companions to view it as a linear list of commodities. Their very survival required that they manipulate the environment, and so it is from their writings that a sense of ecological relationships begins to emerge,” Ibid., 21.
Cronon explains that England had been experiencing “a near crisis of wood” for fuel, housing, and ship building. In the wake of a land crisis, explorers urged the establishment of colonial ventures to settle lands that were “fit” for planting—that is, containing sufficient meadow, pasture, and arable lands. See also Roger Howell, ed., Maine in the Age of Discovery: Christopher Levett’s Voyage, 1623-1624 and a Guide to Sources (Portland: 1988), 9, 24.

As sojourners into “new” lands, both explorers and settlers had clear reasons to describe and assess what they saw; and in each generation, they generally followed an accepted rubric for such accounts. For example, William Wood assured his readers that he “set forth these few observations out of my personal and experimentall knowledge.” He further assured them that he would not make claims about commodities about which he had “taken no great notice.” See Wood, New Englands Prospect. A true, lively, and experimental description of that part of America, commonly called New England (1634; reprinted Boston: 1898), 1, 15.

Levett further explained, “… [nor will deer] stand still and look on a man until he shoot him, not knowing a man from a beast; nor the fish leap into the kettle, nor on the dry land, neither are they so plentiful that you may dip them up in baskets, nor take cod in nets to make a voyage, which is no truer than that the fowls will present you to with spits through them.” See Howell, Maine in the Age of Discovery, 54-55.

For example, John Josselyn explained, “these with many other stories they told me, the credit whereof I will neither impeach nor enforce, but shall satisfy myself … that there are many stranger things in the world than are to be seen between London and Stanes.” See Josselyn, An Account of Two Voyages to New-England (London: 1674), 23-25.

Oxford English Dictionary, Second Edition on Compact Disc (1994): Nature: I.1.a. The essential qualities or properties of a thing. IV.11.a. The creative and regulative physical power which is conceived of as operating in the material world and as the immediate cause of all its phenomena. IV.13.a. The material world, or its collective objects and phenomena, esp. those with which man is most directly in contact; freq. the features and products of the earth itself, as contrasted with those of human civilization, [1662] IV.13.c. in nature, anywhere at all, [1661]. IV.14.a. the or a state of nature: (a) the moral state natural to man, as opposed to a state of grace; (b) the condition of man before the foundation of organized society; (c) an uncultivated or undomesticated condition; (d) physical nakedness, [1667].


William Wood, New Englands Prospect, 28. See also Oxford English Dictionary. Wilderness: 1.a. (without article) Wild or uncultivated land. Distinguished from desert, in that the latter denotes an uninhabitable and uncultivable region, and implies entire lack of vegetation. 1.b. (with article or other defining word) A wild or uncultivated region or tract of land, uninhabited, or inhabited only by wild animals; ‘a tract of solitude and savageness.’ 2. transf. or gen. A waste or desolate region of any kind, e.g. of open sea, of air.

For example, see Edward Johnson, Johnson’s Wonder-Working Providences, 1628-1651 (1654; reprinted New York: 1910), 21, 22, 44, 51; Mary Rowlandson, The Sovereignty and Goodness of God … Being a Narrative of the Captivity and Restora-tion of Mrs. Mary Rowlandson (1682; reprinted in Charles H. Lincoln, Narratives of the Indian Wars, 1675-1699, New York: 1913), 122, ; Robert Cushman, “Reasons and Considerations touching the lawfulness of removing out of England into the parts of America,” in Heath, Mourt’s Relation, 93. A second Biblical reference—the Garden—captured the promise and abundance of the land in a number of sixteenth-century explorers’ accounts of the new world. But once colonization became a reality, that metaphor was largely dropped in favor of wilderness.

Oxford English Dictionary. Wilderness: 3.a. Something figured as a region or a wild or desolate character, or in which one wanders or loses ones way; in religious use applied to the present world or life as contrasted with heaven or the future life.

Howell, Maine in the Age of Discovery, 43; Mourt’s Relation, 24, 39, 83; Wood, New Englands Prospect, 11.

Howell, Maine in the Age of Discovery, 40, 54.

Joel Martin, Sacred Revolt: The Muskogee’s Struggle for a New World (Boston: 1991), 92.

Cronon, Changes in the Land, 21.

According to Howell, Levett was at pains to tell his readers that he was not writing a description of a false paradise where nature rewarded the settler without any effort on the settler’s part. While wealth and resources were there for the taking, the manner of the taking was crucial; forethought careful planning and hard work were all essential. See Howell, Maine in the Age of Discovery, 23, 26.


For example, William Wood explained in 1634: “The timber of the Countrey growes straight, and tall ... generally the Trees be not very thicke, though there be many that will serve for Mill posts .... And whereas it is generally
conceived, that the woods grow so thicke, that there is no more cleare ground than is hewed out by labour of man; it is nothing so; in many places, divers Acres being cleare .... for it being the custome of the Indians to burne the wood in November, when the grasse is withered, and leaves dryed, it consumes all the underwood and rubbish, which otherwise would over grow the Country, making it unpassable, and spoile their much affected hunting: so that by this means in those places where the Indians inhabit, there is scarce a bush or bramble, or any combersome underwood to bee scene in the more champion ground. Small wood growing in these places where the fire could not come, is preserved. In some places where the Indians dyed of the Plague some four teene years agoe, is much underwood ... because it hath not been burned; certaine Rivers stopping the fire from coming to cleare that place of the countrey, hath made it unusefull and troublesome to travell thorow ....” See Wood, New Englands Prospect, 16-17.

29 Mourt's Relation, 84.
30 Cushman, “Reasons and Considerations,” 91-92. In describing the “availability” of land, William Wood explained that one could find “thousands of acres that yet was never medled with.” See Wood, New Englands Prospect, 12.
31 Edward Johnson suggested that long-practiced methods of the native Americans actually were part of God’s design: “the Lord having mitigated their labours by the Indians frequent fiering of the woods”; “parch’t Indian corn inche out with Chesnuts and bitter Acorns.” See Johnson, Johnson’s Wonder-Working Providence, 85, 210.
32 John R. Stilgoe suggests that “Travelers found it difficult to describe landscapes because their view was either too broad or too narrow: From an distance many structures and land forms seemed insignificant; up close they were extremely complex.” See Stilgoe, “Landschaft and Linearity: Two Archetypes of Landscape,” in Char Miller and Hal Rothman, Out of the Woods: Essays in Environmental History (Pittsburgh: 1997), 64-65.
33 John Josselin explained, “The shore is Rockie, with high cliffs, having a multitude of considerable harbours; many of which are capacious enough for a Navy of 500 sail ... the Countrie within Rockie and mountainous, full of tall wood, ... between the mountains are many ample rich and pregnant valleys as ever eye beheld, beset on each side with variety of goodly Trees, the grass man-high unmowed, uneaten ... within these valleys are spacious lakes, or ponds well stored with Fish and Beavers, the original of all the great Rivers in the Countrie ... manifesting the goodness of the soil ... The whole Countrie produceth springs in abundance replenished with excellent waters, having all the properties ascribed to the best in the world.” See Josselin, An Account of Two Voyages, 43-44.
34 Josselin, Account of Two Voyages, 196-197.
37 Ibid., vol. I, 303-304.
38 Similarly, he praised rather than bemoaned “A forest, changed within a short period into fruitful fields, covered with houses, schools, and churches....” See Ibid., vol. I, 6, 7.
39 The evidence of pioneer assessments and evaluations comes from eighty-two largely obscure retrospective accounts, written during the nineteenth and early twentieth centuries, by men and women from families of middling status who traveled to the Midwestern frontier between 1780 and 1860. The pioneers made no claims about the literary merit of their accounts, but they were adamant in their insistence that they were telling the truth.
40 Christina Tillson (b. 1796, moved to Illinois, 1821), A Woman’s Story of Pioneer Illinois (Chicago: 1872), 6-7; Almira Volk (b. 1810, moved to Chicago, 1833, moved to Wisconsin, 1837), The Autobiography of Almira Volk (Milwaukee, WI: 1897), 14; J. Gould (b. c. 1810, moved to Ohio, 1839), “Wanderings in the West in 1839,” Indiana Magazine of History 30 (1934), 79.
42 James Finley (b.1781, family moved to Kentucky 1788), Autobiography of Rev. James B. Finley; or, Pioneer Life in the West (Cincinnati: 1853), 158. William H. Venable (b. 1826, Ohio) saw Nature as the earth and sky, yet found nature in the midst of a well cultivated farm—simply outside. See Venable, A Buckeye Boyhood (Cincinnati: 1911), 89. Mrs. Talbot Dousman (b. c. 1825, family moved to Wisconsin: 1838) described “these beautiful grounds; but it was emphatically ‘God’s country,’ without sight or sound of human habitation.” See Dousman, “Pioneer Reminiscences,” History of Waukesha County, Wisconsin (Chicago: 1880), 473, 474.
44 Caroline Kirkland (b. 1801, moved to Michigan, 1837), Forest Life (New York: 1842), 4. Kirkland wondered how many others would understand her appreciation of “the deep woods ... as a magnificent pleasure for the special delight of those who can discern glory and splendour in grass and wildflowers.” See Kirkland, A New Home—Who’ll Follow? or Glimpses of Western Life (New York: 1839), 251-252.
45 Ezra Ferris (b. 1783, family moved to Indiana, 1879), “The Early Settlement of the Miami Country,” Indiana Historical Society Publications I (1897), 271. S.M.H. Byers (b. c., 1830, family moved to Iowa, 1841) explained, “It was a lovely land too, with rich prairies covered with millions of flowers, beautiful woods skirting its narrow streams ...” See Byers, “Our West in the Forties,” Iowa Historical Record 4 (1889), 389.


47 Tillson, A Woman’s Story of Pioneer Illinois, 65-66. Ellen Badger (b. c. 1840, family moved to Iowa, 1853) explained: “The days would seem the longest and most lonesome crossing the big prairies of Illinois.” See Badger, Memory Links of Seventy Years (n. p.: 1923), 3.

48 A number of pioneers described the “virgin soil,” but they were not unanimous in their praise of it. S.H.M. Byers explained, “We had the virgin soil—and what a prolific soil it was ... On this new mother earth we planted [corn, melons, squash and pumpkins].” See Byers, “Out West in the Forties,” 370. Ezra Ferris saw it as fertile, and prolific, at least as long as “Providence” sent rain. See Ferris, “The Early Settlement of the Miami Country,” 271. Abraham Thomas explained, “The soil abundantly rewarded the industry of its cultivation.” See Thomas, “Life on the Frontier,” 32. By contrast, Robert Duncan (b. 1811, family moved to Indiana, 1820) suggested that, “owing to the rich and wild nature of the soil, wheat could not be grown to advantage for several years.” See Duncan, “Old Settlers,” Indiana Historical Society Publications 2 (1984), 386.

49 J. Gould, “Wanderings in the West,” 96; William Cochran (b. c. 1840, moved to Indiana, c. 1810s), Reminiscences of a Forty-Niner: Being a Brief History of Living and Vicinity when It Was Yet in Its Swaddling Clothes (Lovington, Ill.: 1908), 6. Abel Mills (b. 1829, family moved to Illinois, 1839) explained, “The early settlers of this country settled in or near the timber as it was more sheltered from the storms that pervaded.” See Mills, “Autobiography of Abel Mills,” Journal of the Illinois State Historical Society 19 (1926), 113. John Mack Faragher explains, “For all these reasons, most emigrants first located their homesteads in the timber, usually in the margin near the edge of the prairie, for this area of thinly spaced trees was easiest to clear, and farmsteads in the margin offered the use of adjacent prairies as a grazing ground for the cattle.” See Faragher, Sugar Creek: Life on the Illinois Prairie (New Haven: 1986), 65.


51 Although Rebecca Burlend (b. 1793, England, emigrated to Illinois, 1831) attributed the rich soil in frontier Illinois to that “all-bountiful parent,” she also explained that the soil had been enriched by “vegetable matter, which for ages has decayed thereon.” While she recognized that pioneer agriculture benefited from that “natural” process of soil enrichment, she did not express concerns about whether that advantage would continue. See Burlend, A Woman’s Story of Pioneer Illinois (n. p.: 1899), 62-63.

52 George Carroll (b. 1831, moved to Iowa, 1839) suggested that the unlimited quantities were a problem: “the trouble was we had too much of that kind of fare ... the problem was that it was too abundant.” See Carroll, Pioneer Life in and around Cedar Rapids, Iowa, from 1839-1849 (Cedar Rapids: 1895), 41.

53 Charles F. Coffin (b. 1823, family moved to Indiana, 1824), “Personal Reminiscences of Charles F. Coffin, of Wayne County, Indiana, from 1824 to 1833,” Indiana Historical Collections 3 (1916), 532-3.


56 Ferris, “The Early Settlement of the Miami Country,” 364. Harvey Lee Ross (b. 1817, family moved to Illinois, 1821) explained, “The beautiful groves of timber then standing unmarrred by the woodman’s ax have been cleared away; and the handsome prairies, that were then covered with high grass and beautiful flower, have been broken up, so it is hard to tell which was timber and which was prairie land.” See Ross, The Early Pioneers and Pioneer Events of the State of Illinois (Chicago: 1899), 62, 63.


59 David Turpie (b. 1829, Indiana) explained, “... The best trees were found on the best land; this was the cause, both of their excellence and their destruction.” See Turpie, Sketches of My Own Time (Indianapolis: 1903), 18-19.

60 Kirkland explained, “Would I could hope that the fine remnants of the original forest that still remain to us, were to
be allowed foothold on this roomy earth. They too must fall ere long before the 'irresistible influence of public opinion.'... 'Clearing' is his daily thought and nightly dream; and so literally does he act upon this guiding idea, that not one tree, not so much as a bush, or natural growth, must be suffered to cumber the ground, or he fancies his work incomplete." “Yet I, for one, shall regret even the girdled tress, sad remembrancers of past shade and freshness; ... One would rather have girdled trees than not, and it seems a long time to wait till our locusts and horse-chestnuts grow.” See Kirkland, *Forest Life* (1842), 43, 45-46.

61 Henry David Thoreau, *The Maine Woods* (1864), “Ktaadn,” 21; “Chesuncook,” 157, 173, 196; “The Allegash and East Branch,” 291. He noted, “how base or coarse are the motives which commonly carry men into the wilderness. The explorers and lumberers generally are all hirelings, paid so much a day for their labor, and as such they have not more love for wild nature than wood-sawyers have for forests,” Ibid., 161-162.


64 Ibid., “Ktaadn,” 93. As the pioneers did, he also personified nature: “It is an agreeable change to cross a lake, after you have been shut up in the woods.... It is one of the surprises which Nature has in store for the traveler in the forest,” Ibid., 270.


69 Ibid., “Chesuncook,” 211.

70 Costanza, et al, “The Value of the World's Ecosystem Services,” 255. Seventeenth-century priorities, shaped by particular cultural and economic values, raise questions about the long-term consequences of David Pearce's argument that governments should give priority to people's preferences in determining resource allocation. See Pearce, “Auditing the Earth,” 24. The initial preferences of English settlers were determined by old-world scarcities, but over time, as colonists became more locally self-sufficient, their needs and preferences shifted.

71 William Cronon continues: “We want to know whether environmental change is good or bad, and that question can only be answered by referring to our own sense of right and wrong. Nature remains mute about such matters. However passionately we may care about the nonhuman world, however much we may believe in its innate worth, our historical narratives, even those about the nonhuman world, remain focused on a human struggle over values. If these values are in effect the meanings we attach to judgeable human actions—nonhuman actions being generally unjudgeable by us—then the center of our stories will remain focused on human thoughts, human acts, and human values.” See Cronon, “A Place for Stories: Nature, History and Narrative,” *Journal of American History* 78.4 (1992), 1369-1370.

72 Caroline Kirkland, *Forest Life* (1842), 47.
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**SECONDARY SOURCES**


In back of the conceptions of Nature and the ways that it is valued are myths, internally coherent stories of the origins of things and why they are the way they are. They serve as the grounds of belief and the basis for behavior in any culture. Ancient myths, such as those found in the first several chapters of Genesis, are known in various versions set down several thousand years ago, and modified through time, as contexts changed. Modern myths are more fragmentary, set down partially, and people fill in the blanks with assumptions. The examples that are offered here are based in motifs in the widely praised, yet misleading article by Garrett Hardin, “The Tragedy of the Commons,” that appeared first in *Science* in 1968, and was reprinted in *Managing the Commons* (1977).

Both ancient and modern myths can be interpreted in different ways. The former are discussed by theologians and historians; the latter by historians and other social scientists. As considered here they are not regarded as lies, untruths or even fabrications of wishful thinking, though there is something of the latter inevitably. They embody “truths” and justifications for behavior that have to be analyzed in order to understand, in this case, ways in which Nature is valued and the impacts of these valuations. They contain motifs, that is, symbols, patterned events, and prescriptions, that need to be made clear and objectified, so that the grounds of behavior can be seen. With both ancient and modern myths, people project meanings into them that in the narrow sense can provide reinforced justifications for behaviors. Historians are obliged to uncover the projections and the contexts in which they were and are developed.
It is important to be clear here that there is no intent to make a case that myths are the only factors in shaping conceptions of Nature or its valuation. Reason and scientific research provide the means to develop enlightened views that will indicate ways to better insure the continuance of life in a sustainable and sustaining environment. Obviously, the institutional and ideological contexts are of vital importance in any analysis of the ways humans think about Nature and might do so in more useful ways. The on-going discussion between ecologists and economists that inspired this symposium is a case in point.

Lawrence Simon in this symposium has provided us with a well-delineated set of conceptions that are of importance in the discussion below: intrinsic values and instrumental values. Nature is regarded as having intrinsic value when it is thought important in and of itself, independent of human perceptions and needs. In this view, humans may be regarded as part of ecosystems. Nature as has instrumental value when it is seen as important primarily for humans. Here valuation proceeds on the basis of human needs, in an institutional context.

The phrase, “Tragedy of the Commons,” comes readily to the lips and pens of environmentalists. There is much that seems “true” in it. However, Hardin’s view of how the commons worked in an institutional sense is historically inaccurate. His view of how and why they ended is simplistic, and told in a misleading parable which is discussed in Part I. He ignores the historical commons as a system for valuing Nature and managing the environment, and for insuring social and environmental justice on a community level. In view of these negatives, why his ideas are appealing needs consideration.

This paper presents an answer, but first it is necessary to examine two ancient creation myths in the Judeo-Christian tradition. Part II will treat the first three chapters of Genesis as a primary sources, analyzed for their motif elements and their significance. An interpretation by a medieval historian, Lynn White, Jr., will be discussed, followed by my view. In Part III, the paper will treat Hardin’s essay as a primary source that provides motifs of modern myths that clearly have importance for environmentalists.

Most people who read Hardin’s essay come away believing that the commons never worked and will not in the future, and that regulation in a democratic decision-making mode is necessary. They talk about motifs in which Nature is valued instrumentally. In back of what they see I believe is a “nice” Hardin myth that bears telling. But, there is another one, the “not-so-nice” Hardin myth, that presents Nature as having intrinsic value in a world where most humans are not necessary. Both have all the deep power of any ancient origin myth, dealing with some of the most profound concerns of environmentalists. Both need to be set forth and analyzed objectively with the tool used for examining ancient myths.

Finally, it is useful for the historian to uncover motifs and myths that served as the basis for more sustaining ways of viewing Nature and valuing it. The aim in Part IV is partly to provide an alternative interpretation of the first ancient myth, turning again to White,
then to a biologist, Rene Dubos. Following this, the realities of the commons historically and today will be characterized. A very different picture emerges than a reader of Hardin comes away with. Finally, motifs from social movements in the early modern period in Europe involving resistance to enclosure are briefly mentioned. The aim is to uncover motifs that might provide the basis for revitalized myths that will serve a positive purpose environmentally.

I. HARDIN’S “TRAGEDY”

Hardin’s initial assertion is sensible, although debatable: “The ‘population problem’ as conventionally conceived is a member of [the] class . . . of ‘no technical solution problems.’” No issue is taken with the statement in this article. The assertion that it is necessary to work toward an “optimum population size” is more problematical, but is not dealt with here either (Managing, 17). It is clear is that the classical liberal “laissez faire” policy in reproduction is not adequate for a sustainable environment, as he implies. My intent here is to raise questions about the ways he values Nature, the commons, and humans, and about the character of the institutional controls proposed on behavior.

“The inherent logic of the commons remorselessly generates tragedy,” declares Hardin. Here is where this article takes issue, both with the history and with the values. Hardin presents a parable appealing in its logic. On a common pasture, the herdsman (or shepherd) calculates that he can allow more cattle (or lambs) of his own to come to maturity on the pasture, and for a while no one will notice. He gains the full benefit of their meat, hides, (and wool), that is, the ecosystem goods, while the environmental costs are shared with all the other users of the commons. Therefore, it is inevitably in his interest to increase his flock. All other users of the commons in Hardin’s view are driven by logic (and self-interest) to do the same thing. “Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited.”

This is the product of what he calls the “relentless working of things,” the “tragedy.” “Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons” (20). The “tragedy” repeats itself. Inevitably, the commons will be overgrazed, overcut, overfarmed, polluted and diminished in various ways. Self-interest will see to that. These “commons” are doomed to improper valuation and use. Indeed, he implies that the whole earth is such a commons, and the earth is doomed unless certain prescriptions are followed.

Hardin’s ideas have always been suspect to me. Having a background of study in European agrarian history and German history, I was never comfortable with his view of the commons and what he thought should be done about the tragedy. To the first matter, the “commons” as such were never unregulated. Indeed, regulation and coercion by custom, law and social pressure has always been one of the factors that makes a “commons” such.
In defense of Hardin it is sometimes argued that he was writing about “common property resources.” These are not private property, either because they are government-owned, or, as air and water, not easily renderable into private property. He presented some examples: covering parking meters at Christmas time, opening the National Parks to all without limits, and industrial concerns polluting rivers. These do fit the definition of common property resource, but do not correspond to the historical or contemporary “commons.” Hardin, either out of historical ignorance or wilfully, has taken an important concept for dealing with shared and sustainable use of resources, and made it appear to be unviable. Because of him environmentalists often regard the concept useless for dealing with the valuation of Nature and Nature’s goods and services.

Hardin has created a anti-commons modern myth that many find appealing. It is fairly benign. However, reading him closely reveals that there are in back of his statements motifs for a second and powerful anti-democratic and elitist, eco-centric myth that is problematical, to say the least. In Part III these two myths will be told and analyzed. Now, it is important to turn to several ancient myths that shape Western views of Nature, and its valuation.

II. TWO ANCIENT CREATION MYTHS

In understanding myths and their importance to history, the writer most helpful to me has been Mircea Eliade, especially his Myth and Reality. The definition presented here with its environmental twist differs from his: Myths are stories about primordial times (timeless time) and fundamental truths, that explain Nature around and inside us. They can be considered historical primary sources that have to be approached carefully. They contain a deeper sort of truth, explaining aspects of belief and action in a given culture.

The most important ones to examine are origin myths. They reveal how people and other forms of life got here, their place in the universe and in Nature. They show how Nature is to be valued, how things have changed since the beginnings and why, what should be done and not done, and finally, what obstacles are in the way and why. Analysis of the motifs in myths is a way to make sense of them. In the following analysis, the term “motif” denotes three things: 1) symbols (“The Primal Pair,” “Tree of Knowledge”), 2) the patterned events (“creation in six days”), and 3) prescriptions such as “have dominion,” “be fruitful and multiply.”

THE FIRST ORIGIN MYTH

The first and most ancient creation myth in the Judeo-Christian tradition is found in Genesis, Chapter 1 and the first three verses of Chapter 2. The story is familiar enough and can be found in various versions. Rather than retelling it in detail, the key motifs are set forth both to enable recall of the myth, and to increase clarity about the structure. It starts as an origin myth would be expected to do: “In the beginning God created the
heaven and the earth, and the earth was without form and void.” Then it proceeds with the following motifs:

**Patterned Events**

- Creation over a period of six “days.”
- Creation first by thought, then by action: “And God said, ‘Let the earth bring forth the living creature after his kind . . . and God made the beast of the earth after his kind.”

**Symbolic Figures**

- The “Primal Pair,” a widespread motif in world folklore. “So God created man in his own image, . . . male and female created he them.” The myth indicates man and woman were created at the same time in “our image” by a God with female and male characteristics.

**Prescriptions**

- Birds and fish are to multiply. To humans “God said . . . ‘Be fruitful and multiply, and replenish the earth, and subdue it; and have dominion.’”

**Interpreting the Myth**

Starting with the implications of these verses, medieval historian Lynn White, Jr., wrote a sometimes reprinted and oft-cited article in 1967, in *Science*, “The Historical Roots of our Ecologic Crisis.” He explores key words of the myth and the major contexts in which its meanings were shaped, especially the word “dominion” and its implications. White declares: “By gradual stages a loving and all-powerful God had created light and darkness, etc. God planned all of this [creation] explicitly for man's benefit and rule.” His judgement was that “Christianity is the most anthropocentric religion the world has seen.” In White’s interpretation of the main Christian tradition, Nature has instrumental value. Only humans have intrinsic value. “Dominion” meant and means domination over Nature.

For White there were two important additional contexts in which this meaning was accepted and reinforced: 1) medieval Christianity with its views of humans and Nature, and 2) the 19th century when what he termed the “marriage of science and technology” took place. Thus, as historians often put it today in the 1990s, beside the original context, there were two additional historical ones in which the myths were used and understood, and meanings shaped. For White, the meaning of the word “dominion” was shaped especially in the first of his additional contexts: by hierarchical medieval society.
It is important to remember that the myth and the word at issue (“dominion”) were used in the two different and successive cultural contexts, medieval and modern. This myth and others, as well, are important cultural historical realities that we ignore at our peril because they shape behavior, for better or worse. Even the behavior of the indifferent person is shaped. Thus it is hard to deny that this myth has had a powerful impact on the way the environment is valued and treated in Western cultures.

THE SECOND ORIGIN MYTH

The second Judeo-Christian origin myth was not discussed by White; yet it is even more problematical. Most of the second and all of the third chapter of Genesis presents this myth that has major implications for how we value Nature. This is the one in which there is another, very different version of the creation of the Primal Pair. It begins: “These are the generations of the heavens and of the earth when they were created. . . There was not a man to till the ground.”

SYMBOLS

♦ Primal pair: Adam is made from “the dust of the ground,” and placed in the Garden of Eden. He names all of the creatures, and then God creates Eve from Adam’s rib as a “help meet.”

♦ The Garden of Eden: “And the Lord God planted a garden eastward in Eden; and there he put the man whom he had formed—then the “beasts of the field” and the birds were created. It was a place of innocent harmony.

♦ The two trees in the Garden: Tree of Knowledge and Evil, and a Tree of Life, the fruit of neither was to be eaten. The snake urges Eve to try the fruit of the Knowledge Tree.” Eve ate, then Adam; and they both discovered they were naked. For their disobedience they were summarily ejected from the Garden.

PRESCRIPTIONS

♦ Adam was placed in the Garden “to dress and keep it”—a different sort of “dominion” possibly.

♦ Out in the world Adam would live by hard agricultural labor agriculture, and Eve would have hard labor in birth, and “thy husband . . . shall rule over thee.”

Here is my interpretation of how the myth has been understood by Westerners: We humans were ejected from the Garden, and cannot go back, however much we may long for it. That edenic harmony cannot be restored; Nature is harsh, and humans must wilfully create sustenance from it. Humans are inevitably tempted to grow in consciousness. Good and evil have to be dealt with in all their complexities. Man is to dominate Nature and woman. But Nature is not an easy mistress, and humans have inevitably an antagonistic relation with her. It is easy to discern here the reinforcement for
patriarchal society in this myth, as it is easy to discern the motifs of harsh Nature that must be conquered and controlled.

III. “THE TRAGEDY OF THE COMMONS:” A MODERN MYTH

It is probably not too difficult to accept the idea that two “Ancient Creation Myths” in Genesis have had an impact of how humans value the environment and each other. It may be harder to accept the notion that there are “modern myths” and that they, just as as ancient myths, have impacts. They do affect beliefs and behavior, in both direct and in subtle ways. Modern myths lie hidden behind ideologies. Even the ideologies themselves may be hidden. This is all true of Hardin’s article. There are the motifs for what I term the “nice” origin myth. Then there are the motifs which, although they are not subtle at all, most readers do not see them. They serve as the basis for what I call the “real” Hardin origin myth.

A MYTH ABOUT THE END OF THE COMMONS

To make the motifs in his “nice” myth more explicit, here is first part I wrote in Old Testament style:

The sons and daughters of Cain and Abel were farmers and shepherds, cooks, spinners and weavers unto many generations. They lived and worked on land that was held in common. None said that this land was mine, or that was thine.

Isaac, one descendant of Abel, saw that he could secure more for himself and his kin if he allowed the number of sheep under his control to increase. He did this for several years to his benefit and that of his kin. Soon others in the village realized that the grass grew not as lushly on the commons as formerly and their sheep were suffering. Isaac’s sheep did not suffer, as he knew where the best spots in the common pastures were.

The others went to the village elders and complained about Isaac. Some of them wished to do what he was doing. Others said the old ways should be followed. Isaac came among the elders and said: Each should have their own property, their own land. Then they can decide how to use it to their advantage and could see the limits of what it could produce. And so, the common fields were divided up, enclosed and made into private property. The Lord saw what was done and blessed Isaac and all who believed with him.

There are several motifs that have appeal today, even for environmentalists. But first, notice that there is nothing here yet about regulation, the prescription readers of Hardin would expect. Another prescription is set forth first, as analysis of the motifs will show.
SYMBOL

- The shepherd is the “rational capitalist man,” the culture hero of the classical liberal ideology that we call “economic conservativism” in this country.

PATTERNED EVENT

- The shepherd pursues inevitably his self-interest, which leads to overloading the commons. Hardin is ambivalent toward this figure. He is presented as an embodiment of what is sometimes termed “Human Nature.” Setting in motion a process of creating private property, he plays a positive role for Hardin. But there is more to the myth in its second part to come. There he sets in motion a reaction to his actions; hence, the ambivalence.

PRESCRIPTION

“Regulation” is what readers of Hardin usually talk about exclusively. However, there is something more subtle in the parable of the shepherd and what follows. Perhaps it is only recognizable to readers who know something of European agrarian history. What happened to the commons, whether used for arable, pasture, meadow, or wood supply in England from the 16th through the 19th centuries was “enclosure.” This involved splitting up the commons, creating fenced holdings, and, legally, a system of in-fee landowners and tenant farmers on longer term leases. The justification for enclosure often was that individuals could make decisions that would lead to greater production, though there were other rationales, as well.

The parable of the shepherd and his cost-benefit calculation Hardin intends to be applied to the relation of resources and population. Knowing what happened to the commons historically leads to search for evidence that Hardin believes that part of the answer to overloading commons was to convert them to private property. That evidence is there. However, he certainly is not a property rights enthusiast. In a very realistic statement, he declares there must be a “redefinition of property rights” (Managing, 22). He has a bit of faith that owners of private property will inevitably recognize resource limits, a concept very much rooted in the Jeffersonian myth. There the great symbolic figure is the independent farmer who knows his land, its values and limits—a well-established American culture hero.

CONTINUING THE “NICE” MYTH: THE ORIGIN OF REGULATION

Private property is basic to Hardin’s myth, and his ideological outlook. But Hardin does not stop here. His real concern is not farmland, but pollution and population growth. Continuing with the “nice” origin myth, here is the justification for the need for regulation. As with the first part of the myth, there is a strong basis in what happened after commons were enclosed.
After the passage of some years, Isaac, his kin and friends prospered even more. They rented land for hay and, on fields with a stream flowing through them near the village, increased the number of sheep greatly. Once a year they took the wool to the distant city for sale. But many in the village, elders among them, noticed that there was a strong odor of manure everywhere; the water in the stream was no longer good to drink. A pond downstream where women had traditionally gone to wash clothing had turned green.

With the loud laments of the women in their ears, the elders took counsel with one another. One among them who was more observant and wiser than the rest said: “Look at what is happening to the world that God hath created. We need to set limits on the number of sheep that can be raised in a given area of land, and to not allow great numbers near our stream.” And the elders agreed with one another, even though this meant telling people what to do on their own property. They declared that this was indeed the action that would please the Lord. This action was carried out under the ancient prescription: “Mutual Coercion Mutually Agreed Upon.”

This an appealing prescription. The herdsman has played his historic role. Now he must be controlled. Hardin wants us to know that pollution and the “population problem” can only be dealt with by regulation. Of course, he addresses us in modern rational terms, not the archaic ones I have used here to enhance the mythical qualities. “Mutual coercion” sounds democratic! This is what that most readers see implicit in his article. They project upon Hardin a belief in a majority decision-making process for dealing with environmental problems, including “overpopulation.”

THE “REAL” HARDIN ORIGIN MYTH

If Hardin is read closely, his commitment to democratic institutional means to value and manage Nature is less convincing. What follows may seem at first glance just a different version of the second part. The first part already told about the origins of private property still stands before this. Given the dramatic differences in the motifs and their associations, this really constitutes a second myth. As I tell it here, the myth will make more obvious the institutional and ideological contexts he proposes for dealing with pollution and population growth.

Isaac allowed the number of sheep on his lands to increase, rented hayland and put more and more sheep on his land near the village. The stream where his sheep watered became unfit to use. He continued in this manner for several years to his benefit and that of his kin, for he had access to water upstream where it flowed through his land. He and his wife, and their kin had more children. They truly believed the Lord had blessed them with land and issue. Others in the village, much less fortunate, had more children too, counting on the old tradition of support for the poor cottagers and the landless. They became very discontent, murmuring amongst themselves that in the division of the commons Isaac and his friends had taken the best land.
These others came unto to the village elders and complained about Isaac and his friends, what he was doing to the land, how he and his children were no longer following the Lord's ways. These others told of their suffering and that of their children.

But Isaac gathered his kin and friends, and told them to arm themselves with cudgels, scythes and axes and come to the village council. Then Isaac came among the elders and said: “Freedom to breed is intolerable.” “Conscience is self-eliminating,” in farming and other forms of land use, as well as in decisions about how many children to have. Each family has its own property, large or small, their own private land. They can decide how to use it to their advantage and not overload it. However, we need “custodians,” all-knowing people, who will regulate so pollution does not occur, and, especially, for the less-well off, regulate the number of children they may have. “Freedom is the recognition of necessity” was his harsh closing line.

The poor and less-well-off were angry with Isaac. But the threat of the scythes, and cudgels and axes in the hands of Isaac’s kin and friends coerced them into accepting Isaac’s plan. People were allowed to have only so many children as the custodians thought their household lands could support. Nature had bestowed her bounty selectively upon people, and that had to be accepted. The Lord saw what was done and blessed Isaac and all who believed and acted with him. And he and his kin and friends lived long as “custodians.” Nary a soul dared question their authority.

**MOTIFS IN THE “REAL” HARDIN ORIGIN MYTH**

The words in quotes are Hardin’s, ones ignored in the usual reading of the article.

**SYMBOLIC FIGURES**

♦ The “custodians” are the scientists who understand how ecosystems function and know the limits of the earth.

**PRESCRIPTIONS**

♦ Do not rely on conscience to regulate pollution and population growth. It is “self-eliminating.” Moreover, relying on it has “pathogenic effects.” With perhaps unconscious irony he quotes the libertarian, Paul Goodman: “No good has ever come from feeling guilty, neither intelligence, policy nor compassion.” Goodman’s ideas about freedom and authority are diametrically opposite from Hardin’s, so the question has to be raised whether Hardin seriously cares about guilt feelings.

♦ Eliminate the welfare state, for it encourages “freedom to breed” which “is intolerable.”

♦ “Mutual coercion mutually agreed upon” which he professes to mean in a democratic sense. However, no attention is paid to the problem of quis custodiet ipsos
custodes, except to say “We must find ways to legitimate the needed authority of both the custodians and the corrective feedbacks.”

(Managing, 23-26).

Clearly Nature for Hardin has intrinsic value. What he thought of the value of human life when he wrote in 1968 is much less obvious. Hardin describes himself toward the end of the article as a “genetically trained biologist” and states: “Those who are biologically more fit to be the custodians of property and power should legally inherit more” (27). The “real” Hardin origin myth may seem extreme at first reading. However, the motifs are his. His prescription to solve the pollution and population problems was environmental authoritarianism. It is fair to say that his is an elitist, eco-centric viewpoint.

IV. REALITIES AND MYTHS

Myths can serve positive ends. Certainly, for environmentalists the appeal of Hardin’s article is the justification it provides for regulation in an apparently democratic context. This appeal is based upon motifs that serve as the basis for the “nice” Hardin origin myth. The problematical motifs are not noticed, those that serve as the basis for the “real” Hardin myth. Readers accept without question his discrediting of the commons as a means of valuing and managing Nature. Yet commons as both historical and contemporary physical and legal realities are viable ways to do both valuing and managing. Myths have served social movements in part seeking to preserve or restore the commons. Before these realities or myths can be examined, it is useful to consider how the ancient origin myths can be reinterpreted and serve as bases for positive environmental action.

REINTERPRETING ANCIENT MYTHS

Despite his negative view of how Christianity values Nature, at the end Lynn White could not reject his own religious tradition. He concludes his essay suggesting that the values and the work of St. Francis are models for Christians to ponder. To White, St. Francis was an advocate for “the democracy of all God’s creatures.” To use Prof. Simon’s terms, for the Franciscans all elements of creation had equal intrinsic value. Here is a kind of eco-centrism, very different than the elitist, activist controlling kind that Hardin called for.

In contrast, there is an interpretation offering a human-centered view. A biologist, Rene Dubos, answered White through a talk at the Smithsonian in Washington in 1969. He offers a meaning for “the word ‘dominion’ more suited to our time, . . . responsible stewardship.”8 Humans should frankly recognize the varying instrumental values in Nature and manage the environment productively for the long term. He calls for examining the values and work of the Benedictine order for examples of what we today in the 90s would call a sustainable economy in a sustainable environment.
In my view, the first ancient origin myth is more useful for Western circumstances today than the second one. Men and women equally are the stewards over the creation of an androgynous God. There is no earthly paradise to which we can return. God’s creatures have evolved over time. Dominion means responsibility, not conquest. Just as meanings of myths were reinterpreted in earlier historical contexts, so environmentalists have the opportunity to look at the ancient myths in the light of our present problems and seek to revitalize them. There is no reason why Jews and Christians both, from the left to the right, cannot search in their mythic traditions for ways to support sustainability.

The ancient myths are a part of Western culture. Even if individuals personally are not believers and followers of a religious tradition that draws from the myths, it is inevitable that the habits of mind that these myths justify permeate our thoughts on some level, and our actions. The reinterpretation of these myths for our time requires conscious thought and investigation of the levels of meaning in the motifs to reaffirm positive elements.

THE REAL COMMONS

Even if the usual reading of Hardin, as expressed in the “nice” myth, may express some positive motifs, the “real” myth raises serious questions about how he values Nature, including humans, and proposes to institutionalize the values. Positive realities and positive motifs of the historical commons need to be considered as a counter to his message.

The commons wherever they occurred or occur today are understood positively as a system of land use, where resources (rangeland, pastures, meadows, arable land, woodlands, fishponds, flowing river water, etc.) are shared by a defined group of users. Their rights are preserved by custom, law and social pressure. The term also applies to the actual land or water resource under such system. Thus the term “commons” applies to both the legal realities and the physical realities. It can imply a valuation of Nature based on human needs and the appropriateness of the land or resource use in relation to sustainability.

Commons were and are found the world over in differing forms among people ranging from nomadic herders to settled agriculturalists. To see their endings arising from population pressure is an oversimplification. Historians have argued long and hard over why they were eliminated in England in various periods without coming to a conclusion. To a limited extent, Hardin was correct with his focus on the motif of the self-interested shepherd. The classical liberal myth of the self-regulating economy based upon the “invisible hand” did lead policy makers and entrepreneurs into believing that enclosing the commons would benefit themselves and their country through the production of more of Nature’s goods. So it can be argued that population increase was not the culprit; ideas and myths were.
CHARACTERIZATION

♦ Land and other resource uses in commons systems are shaped by the character of soils, topography, water, and climate. In some cases this amounts to a sensitive valuation of the appropriate uses for these elements of Nature.

♦ All in the user group have access to different kinds of land (pasture, meadow, crop land, woodland, fishpond, etc). In some cases this may amount to something approaching social and environmental justice; in others, unfortunately, no such thing.

♦ Rights and abuse of them are controlled by conscience, custom, law and social sanctions. Commons, as such, were never unregulated historically. So they cannot be considered the same as “common property resources,” which are actually more like the medieval “wastes” over which no control was exercised.

♦ It was a flexible system: Open to modification to increase productivity through adoption of new crops, crop rotations, livestock improvement, pasture management. There are many examples of this in England and on the Continent from the 17th century onward. Likewise, there are examples of their working today.10

REVITALIZING THE MYTH OF THE COMMONS

In early modern Europe there were mythic motifs connected with the commons that were expressed in social movements that resisted enclosure in Britain and on the Continent. For instance, there was the repeated primal event motif: Land is given by God to those who need it and work it, as it has been since the Garden of Eden. The prescription: It should be restored to those who need it and work it, and they should control it. “When Adam delved and Eve span, who then was Gentleman?” These motifs came out in the 14th century in “John Ball’s rebellion,” and in the 17th century among the Diggers during the English Civil War. These motifs reappeared in Germany in the 16th century during the Peasant Uprisings that accompanied the Reformation.11

Thus, the commons was and is not only a physical reality and a legal reality; it is a mythic concept. As a myth it is based upon positive historical realities, one where awareness of Nature and valuing of her attributes shaped how land and water were used. Conscience and community coercion were the regulatory controls. Thus the commons worked because of “mutual coercion” in some cases “mutually agreed upon,” in some not. Translated into various modern institutional forms, it could serve as a model for valuing and managing Nature, and for opening up possibilities to achieve environmental and social justice.
There is no reason why private property and private property rights need be the only way to deal with resources and population balances. Common property and common rights will do well, in addition. In the years since Hardin wrote his provocative article, much work has been done in the North American land trust movement to create “modern commons” where various parties have rights and responsibilities in and toward farmland, woodlands, scenic and historic resources. An argument can be made that modern environmental legislation and practice regarding air and water creates commons.

CONCLUSION

This analysis has gone into the realm of myths and their meanings. It is not possible to understand how Nature is valued unless the myths upon which valuations often are based are understood. Our post-industrial context compels us to look closely at the two Genesis origin myths for both their problematical and positive motifs. It is evident that there are two meanings of the word “dominion” that have emerged in several historical contexts: domination and stewardship. In the present Western context it is obvious that the second of these meanings is the one that should be emphasized. Too much human behavior is based on the first.

We are moved by modern myths, as well as ancient ones. These modern myths stand behind modern ideologies. To help understand why we do some things it is important to clarify the ideological premises of our actions, and to uncover the mythic bases under the premises. I have tried to show what readers usually see in Hardin’s article and what escapes them through telling two myths. It is the second that is most problematical.

Finally, it is evident that humans need myths and inevitably create them, and base behavior, in part, upon them. Environmentalists need to reach into their own religious traditions and ideological foundations to rescue myths and seek ways that the positive motifs in them can be understood. The historical realities of the Commons and the associated mythic motifs offer some ways to value Nature and work toward a sustainable environment.
NOTES

1. Eliade does not use a Freudian or Jungian approach. His is a very practical comparative study of mostly non-Judeo-Christian myths.

2. The three-fold characterization of types of motifs is mine. Stith Thompson's classic Motif-index of Folk-literature provides a scheme of topical organization for the analysis of myths and an alpha-numerical system to categorize and compare them. Thompson confines himself to using the word "motif" generally without distinguishing types.

3. The quotes here are from the King James version. Some of these motifs are widespread in the world, as an analysis using Thompson reveals. Bernard Batto, a theologian, in his Slaying the Dragon: Mythmaking in the Biblical Tradition, sees the origins of many of these motifs in Mesopotamian myths, reworked to fit the conceptions of the world of the Hebrews.

4. It has been reprinted in a number of places, including 18-30 in Barbour. More important, it has been very widely cited. Between 1974 and 1998, the on-line Science Citation Index lists 65 articles that referred to White's piece. So just as Hardin's article has shaped several generations of environmentalists' views of the commons, so has White's, of Judeo-Christian traditions. See esp. 25 in the Barbour collection.

5. These are not at all Botto's concerns in his Mythmaking. He compares the motifs in both creation myths to Babylonian sources, and analyzes the words in early texts of the Pentateuch. He concludes that the Edenic myth was traditionally the first in the series in Genesis and set down in the 8th century B.C.; that the first myth actually was added later by the so-called "Priestly Writer." What is useful about his book is that it takes the reader into much greater linguistic contextual depth than White did. He reveals how important it is to understand the varying meanings of motif words in their original languages and how much myths change with changing contexts and cultural influences.

6. The first balanced view of the early period of this process was in R. H. Tawney's The Agrarian Problem in the Sixteenth Century originally published in 1912.

7. Every time I have used Hardin's article in an environmental studies core course since 1974, students come up with an account in back of which this "nice" myth can be perceived.

8. White in Western Man, 28-29. Rene Dubos, "A Theology of the Earth," 43-54. According to the Science Citation Index, Dubos' article is referenced five times in the same period that White's was sixty-five times.

9. The study of the commons, their enclosure, the reasons for enclosure and the impacts in England has been going on for at least one hundred years, so there is an ample literature. H. S. Bennett in his Life on the English Manor... 1150-1400 presented a carefully drawn picture of the pluses and minuses of communal agriculture; of the ways of those who attempted to "cheat" the system and of the ways they were called to account (41-60). In his essay "The Agrarian Legislation of the Revolution," Christopher Hill shows in detail the class and ideological basis of efforts to take over and sell the estates of Royalists, bring about enclosure, and the resistance to these moves in the 1640s and 50s. The picture is completed by J. D. Chambers and G. E. Mingay in The Agricultural Revolution 1750-1880. See esp. their chapter on "Enclosure," 77-105, with its sometimes surprising findings. Those who wish more may turn to the eight volume Agrarian History of England and Wales, Vol. 7 on the 19th century edited by E. J. T, Collins, the last one to be published, will soon appear.

10. Some of these characteristics are illustrated in an article that appeared in Science in the summer of 1998, "State Policy and Pasture Degradation in Inner Asia." It compares the degree of pasture degradation in adjacent grassland parts of Siberian Russia, northeastern China, and Mongolia situated between the two. Overgrazing took place in Russia and China, with consequent decline in productivity. In Mongolia, what the authors describe as the traditional "mobile pastoralism" was retained. Policies based on what I term "the rational socialist man" led to the situation in the former two. Chambers and Mingay recognized that in many places in England agriculture in the commons in the 18th century was innovative and efficient (48-52). Examples of functioning commons in Switzerland, France, Germany and Russia were described by Peter Kropotkin in his Mutual Aid. A Factor of Evolution published in 1902 (236-58).

11. There is need for careful analysis of the contexts in which the motifs were set forth. Some of the writings are from clear ideological perspectives that shaped, perhaps unduly, their account. Examples: Kropotkin, 223-236; Friedrich Engels, The Twelve Articles of the peasants in his Appendix (158-63). This document is a primary source that clearly expresses the desire to preserve and restore the commons in the 1520s.
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Does nature have value? How does one answer such a question? It is hard to imagine anyone seriously denying that nature has value, but one might well want to reply to this question with others. Do you mean all of nature? Nature taken as a whole or broken down into parts? Each and every part of nature? Valuable in what ways? In fact, the question of whether nature has value leads directly to the question of what that value might be. And this question in turn raises a question about how we might determine the value of nature, and in particular, whether that value might somehow be measured.

The easiest way to think about the value of nature is to list the things we get from nature that satisfy our needs and wants, the ways in which nature is valuable to us. Food, water, air and raw materials are just the beginning. Nature also provides recreational opportunities and unparalleled aesthetic experiences, and for many, a chance to escape the hustle and bustle of the city. A more sophisticated ecological perspective would include as well such services as climate control, nutrient cycling, pollination and waste treatment among others, all essential to our life support system on Earth. Human life is clearly dependent on a well functioning nature, and a sense of the value of nature can be gleaned by imagining substituting artificial materials and technologically based goods and services for those now provided by nature. At least at our present and foreseeable levels of technological sophistication, it is hard to conceive of such substitution on any large scale being successful.

Yet, as obvious as the value of nature may be in these ways, many believe that our behavior belies this value. We are depleting the stocks of natural resources, we are filling up the sinks in nature where we send our wastes, we are undermining the healthy functioning of ecosystems that provide us with services such as pollination and nutrient recycling. One reason offered for this behavior is that the value of nature is not properly captured in economic terms that are then reflected in market and policy decisions. When
we calculate the costs and benefits of various individual market and policy alternatives, we do not bring nature, its functions and services, properly into the equation in monetary terms. Natural functions and services are for the most part free, and unless we are forced to pay for a breakdown in such a function or service (for example, to clean up pollution or find a substitute for a function fulfilled by a species driven extinct), our uses of them do not need to be registered as costs. For some, this is a very serious omission. “Because ecosystem services are not fully ‘captured’ in commercial markets or adequately quantified in terms comparable with economic services and manufactured capital, they are often given too little weight in policy decisions. This neglect may ultimately compromise the sustainability of humans in the biosphere” (Costanza, et al., 253).

To remedy this deficiency in how we value nature, some economists have recently begun to discuss how one might estimate the economic value of the services we receive from particular ecosystems. Yet more ambitious in scope is a recent attempt by Costanza et al. to estimate the total aggregate economic value received by humans from all of nature’s ecosystems. The figure they arrived at was $33 trillion per year, an amount that exceeds the world GNP. If one accepts the results of this study, then we have a very impressive answer to the question of the value of nature.

The Costanza et al. study has provoked a good deal of critical response that questions both the methodology used and the very coherence of the project. It is not clear one can capture the total economic value of ecological goods and services to human beings, that it makes sense to attempt to do so. In any case, many of the specific methods employed by Costanza et al. have been challenged.

Rather than discuss those criticisms, however, I wish to take a somewhat broader look at the issues raised by this attempt to capture the value of nature in economic terms. In particular, I wish to ask how we should think about the kinds of value, economic or otherwise, that nature has and how they might relate to each other. But in order to do this, I must first examine the nature of value. The concept is a complex one and various distinctions need to be clarified. Without careful conceptual analysis of value, we risk falling into various mistakes.

For instance, many environmentalists want to attribute a non-economic value to nature that is independent of human beings, what is often termed a non-anthropocentric value. The motivation to do this is often the wish to discourage the prevailing view of nature as a mere resource for the satisfaction of human desires, as having only economic value. However, it has been extremely difficult to establish philosophically these sorts of claims about the value of nature. Many feel, and I agree, that attributing a non-economic, non-anthropocentric value to nature involves a kind of metaphysical excessiveness that is best avoided. Invoking what might be called a principle of methodological conservatism, I believe that our philosophical task should be to clarify and defend the substantive positions we wish to hold while revising as little as we can what seem to be the dominant and best grounded metaphysical views of our tradition.
If the view that attributes a non-economic, non-anthropocentric value to nature is mistaken, so, I will argue, is the position that holds that economic value exhausts the value of nature. While nothing that Costanza and his fellow authors say commits them to the claim that that the only sort of value that nature has is economic value, their general approach might mislead someone into thinking that. Their study proceeds within the discourse of economic analysis using a standard concept of economic value. Furthermore, their project of estimating the economic value of nature lends itself to standard policy decision-making methods using cost-benefit analysis, as they acknowledge: “A second important use of these estimates is for project appraisal, where ecosystem services lost must be weighed against the benefits of a specific project” (Costanza, et al., 259).

I share the critics’ skepticism about the coherence of the Costanza et al. project. It is not clear that it makes sense to ask about the aggregate economic value of nature’s functions and services. It may, however, make sense from within economics to calculate the economic value of particular goods, functions or services while resisting any attempt at summing them. Nonetheless, there remains a danger here if we are tempted to think that such value exhausts the value of nature. Furthermore, understanding the value of nature, or particular parts of nature, solely in economic terms may lead us to rely on cost-benefit analysis with potentially regrettable results. If we correctly understand the value of nature, we will realize that nature has value that resists incorporation in such analyzes. From the point of view of our question, “What is the value of nature?” we should not be trapped into thinking that the only alternatives are to see the value of nature as wholly captured in economic terms, on the one hand, or to attribute a non-anthropocentric value to nature, on the other.

I. THE NATURE OF NATURE

Before examining the concept of value, I should say something about the concept of nature, since it too is a complex one. The word “Nature,” it has been pointed out, is one of the most ambiguous, but equally, one of the most indispensable words in our language. There are at least three senses in which we use the word that are worth distinguishing:

1. Nature as the entire non-human world, everything in the world apart from human beings and their artifacts. The contrast term to nature in this sense is human. Nature is opposed to civilization, art and technology, the artificial world created by human endeavors. In this sense, we leave nature when we enter the city. The garden, and in a different way, the farm, is, one might say, the transition from the natural to the human. When environmentalists and others talk of how humans are destroying
2. Nature as the global ecosystem—all of life on earth and its physical support systems. We intend this sense when we talk of nature as if it were the system of all living things on earth. In this sense, of course, humans and the human-built parts of the world are all part of nature. We would leave nature, in this second sense, if we left the earth. This is the most ecologically grounded sense in that the idea of a particular ecosystem, a wetland, for instance, is really only abstracted from its environment. All ecosystems are connected ultimately causally, functionally and in space and time. The human presence on this planet can be separated from the rest of the environment only by the same process of artificial abstraction. If in the first sense of nature we can talk about humans and their environment being in a symbiotic or perhaps antagonistic relationship, in the second sense we realize the artificiality of this distinction.

3. Nature as everything that is subject to the laws of nature, nature as all of material reality. This is the broadest use of the term. In this sense we cannot leave nature except with death, and only then if we are immortal. The contrast term to this sense is supernatural.

Environmentalists sometimes use the first sense and sometimes the second. The third and most philosophical sense is generally not relevant to discussions of the environment. Though the ambiguity between the first and second senses is usually innocent, it can lead to confusions. Economists almost always intend the first sense. For my purposes, I will be using the first sense for what I am examining is the value of nature apart from humans. In the second sense of the term, the value of Manhattan could be taken to be part of the value of nature, and that is certainly not what Costanza et al. meant. Also, in the context of cost-benefit analysis, it is important to be able to disaggregate nature. One wants to be able to talk about the value or values of particular parts of nature (a certain ecosystem, for instance) rather than nature as a whole.

II. THE NATURE OF VALUE

INTRINSIC AND INSTRUMENTAL VALUE

As I mentioned above, the concept of value is a complex one and needs to be carefully unpacked. I will use a discussion by David Brink of the types of value, or as he calls them, theories of value as a guide into this thicket of distinctions. The primary sense of value, most philosophers would agree, is intrinsic value. Intrinsic value is value that
something (an action, event, object or state of affairs) has in itself, independently of its relations with other things. Thus Brink begins his discussion of value by remarking that “Theories of value, as I shall understand them, are theories of intrinsic value: they make claims about what things (e.g., actions, states, events) are valuable in themselves, necessarily valuable, or valuable whatever else might be true” (Brink 217).

Intrinsic value is most often distinguished from instrumental or extrinsic value, where these terms are used more or less interchangeably. As Brink notes, “Intrinsic goods are to be contrasted with things that are extrinsically valuable and things that are necessary conditions of realizing intrinsic value. Something is extrinsically valuable if it is instrumentally valuable, valuable as a means, or causally produces (either directly or indirectly) intrinsic goods” (Brink 217). Instrumental value, then, is value something has insofar as it can be used to produce or is an instrument for obtaining something else of value. What I have been referring to as economic value is thus a form of instrumental value. To say that nature has economic value is to note that we use parts of nature as means to ends we desire or regard as valuable. To claim that nature has only instrumental value is to deny that it has intrinsic value as well, that is, to deny that it is valuable in itself or as an end.

It is commonly noted that instrumental value cannot be the only form of value. Instrumental value is value in relation to something else, the means to some end. If the end were itself only instrumentally valuable, then it too would only be valuable as a means to some yet further end. And if this further end, in turn, were only instrumentally valuable, then one would want to obtain it only in order to use it to obtain yet another end. This sequence must end in something that has intrinsic value, value in itself or as an end, on penalty of becoming an infinite regress which would vitiate the point of the sequence. Thus there must be something that has intrinsic value to give point and purpose to the pursuit of those things that are instrumentally useful to obtain it.9

The most philosophically influential candidate for something that has intrinsic value is pleasure, so that the hedonist (for example, the classical utilitarian) holds that only the pure mental state of pleasure is intrinsically valuable. But many other candidates have been suggested as well, including other states of consciousness in addition to pleasure, desire satisfaction, personal relationships including love and friendship, truth, beauty, freedom, artistic and intellectual excellence, moral goodness, rational autonomy, nature and, of course, human life itself.

PERSONAL AND IMPERSONAL THEORIES OF INTRINSIC VALUE

Brink goes on to make two further distinctions among types of intrinsic value or, as he puts it, theories of [intrinsic] value. The first is between personal and impersonal theories. “A theory of value is personal if it recognizes as intrinsically valuable things that are valuable only insofar as they contribute to the value of people’s lives (or more broadly, the lives of sentient beings). A theory of value is impersonal if it recognizes as intrinsi-
cally valuable things that are valuable independently of their contribution to the value of anyone’s life” (Brink 219). For instance, a theory that held that pleasure was intrinsically valuable would be a personal theory, for pleasure must be had or experienced by someone. The more pleasure in a life, the more value that life contains. Thus, bringing pleasure to a life makes that person’s (or sentient being’s) life more valuable as a result.

On the other hand, some philosophers have held that truth and/or beauty are intrinsically valuable, or indeed, that nature is, and that truth and beauty bring value into the world regardless of whether they contribute to the value of anyone’s life. G. E. Moore famously held that the mere existence of what is beautiful has intrinsic value, that beautiful objects added to the value of the world, even to a world where there were no human beings or other sentient creatures. Similarly, some maintain that degrading nature diminishes the value in the world regardless of whether doing so negatively affects anyone’s life. Such theories of the intrinsic value of truth or beauty or nature would be impersonal theories.

Brink claims that impersonal theories are implausible and difficult to understand. “But I think that many of us find impersonal theories of value hard to accept....it seems hard to believe that things might be of intrinsic value that made no contribution whatsoever to anyone’s well-being” (Brink 219). This claim may appear to be more assertion of intuition than argument, but he notes, rightly, that “most philosophers have defended purely personal theories of value. Personal theories claim that all intrinsic goods are components of valuable lives” (Brink 220). If, in fact, most philosophers have defended personal theories of value, then the principle of methodological conservatism mentioned above should cause us to be wary of embracing too easily an impersonal theory.

There is, however, a certain ambiguity in Brink’s phrases such as “contribute to the value of people’s lives” and “components of valuable lives” that is relevant to a point I will make below. The phrases may be taken to mean that intrinsically valuable things add to the well-being or welfare of a life, however that may be construed and measured. On the other hand, the phrases may be taken to mean that intrinsically valuable things make a life more valuable, where that is not directly connected, and may be in opposition to, increasing the well-being of the life. Well-being is itself a notoriously difficult concept to pin down. Nevertheless, the ambiguity becomes apparent when one realizes that measuring or adding to the well-being of a life is not the same as measuring or adding to the value of a life. We want to be able to say that a person can do valuable things, things that add to the value of her life, that at the same time do not add to her well-being and in fact may require the sacrifice of well-being. T. M. Scanlon observes that if we take the value or worthiness of a life to mean “the degree to which it is particularly admirable and worthy of respect...value in this sense is, again, clearly distinct from well-being. The life of a person who sacrifices his own well-being for the sake of others may be, for that reason, a particularly valuable one, and in order for this to be true there must be a sacrifice involved” (Scanlon 112). An action or condition that diminishes a person’s well-being might well be regarded as enhancing the value of that person’s life.
Given this distinction between the well-being of a life and the value of a life, we can
distinguish two forms of impersonal value: that which contributes to the value of a life,
but not, at least directly, to the well-being of that life, and that which does not contribute
to the value of a life at all. For the sake of clarity, I will call the first sense of impersonal
value life-enhancing impersonal value and the second sense life-irrelevant impersonal
value. Brink's distinction, then, must be expanded to a three part classification: theories of
personal value, where what is intrinsically valuable contributes to the well-being of a
person's life, and in this way to the value of that life; theories of life-enhancing impersonal
value, where what is intrinsically valuable contributes to the value but not directly to the
well-being of a person's life; and theories of life-irrelevant impersonal value, where what is
intrinsically valuable is independent of and does not contribute directly to either the value
or the well-being of a person's life. Depending on what sorts of things one countenanced
as having value, one could have a pure theory recognizing only one of these categories of value
or a mixed theory recognizing two or even all three kinds of value.12

Brink's difficulty with the concept of impersonal value is with the notion of life-irrelevant
impersonal value. I share his hesitation to countenance this form of value. The concept
does seem to me to be metaphysically excessive from the perspective of the principle of
methodological conservatism.13 But I am principally interested in the former sense of
impersonal value, life-enhancing impersonal value, that which contributes to the value of a
life, but not directly to the well-being of that life. I will argue below that insofar as econom-
mists restrict their interest in value to value that adds to the well-being of people’s lives,
they recognize only Brink's personal value. If there is life-enhancing impersonal value,
value that can add to the value of a life but not its well-being, then this form of value
cannot be captured by the methods used by economists. Various consequences will follow
for what we can say about the value of nature from the perspective of economics.

SUBJECTIVE AND OBJECTIVE THEORIES OF INTRINSIC VALUE

The second distinction that Brink makes is between subjective and objective theories of
value. “Subjective theories of value claim that the components of a valuable life consist in
or depend importantly on certain of an individual’s psychological states” (Brink 220). In
contrast, “objective theories of value claim that what is intrinsically valuable neither
consists in nor depends importantly on such psychological states” (Brink 220). According
to objective theories, it is taken to be a fact about the world that certain things are valu-
able, things that bear no necessary relations to any particular psychological state, and that
as the amount of these things increases, more value comes into the world and the world is
hence more valuable.

Subjective theories will all be theories of personal value. If value consists in or depends on
certain kinds of psychological states that are deemed valuable, then increasing value will involve
increasing the instances or intensities of these psychological states. These states will presum-
ably be states of someone's psychology, so that increasing value will increase the value of that
person's psychological experiences, and thus contribute to the value of that person's life.
Brink makes the point, now familiar in the literature, that we can distinguish at least three different and competing versions of subjective theories of value: what he refers to as hedonism and two forms of desire-satisfaction theories, actual desire-satisfaction theories and counterfactual desire-satisfaction theories. Hedonistic theories, sometimes called mental state theories, claim “that a valuable life literally consists in certain psychological states” (Brink 221). The leading contender for the intrinsically valuable psychological state is, as the name of the theory implies, pleasure. Pain, correspondingly, would have an intrinsic disvalue. The value of a person’s life would be enhanced by the experience of more pleasure and less pain. While pleasure has been considered the most obvious candidate for intrinsically valuable psychological state, one might argue that other mental states, for instance, the state of being in love even when that is painful, are also intrinsically valuable, or even that pleasure is not intrinsically valuable but other mental states are. Hence, some prefer the label “mental state theory” rather than hedonism for this position.14

Desire-satisfaction theories, or as they are sometimes called, preference theories, hold that “value consists in the satisfaction of one’s desires and that disvalue consists in the frustration of one’s desires” (Brink 221). In these theories, desire satisfaction is not identified with a particular mental state, for instance, the state of satisfaction or pleasure that is the result of a desire having been fulfilled. Rather, it is the state of affairs consisting of a desire being satisfied, not any mental state that might normally be expected to accompany such a state of affairs, that is considered the primary object of value. These theories can agree with mental state theories that certain psychological states are valuable, such a pleasure or satisfaction. But they do not want to restrict the valuable to these states. The insight here is that the value of a life might be enhanced by the satisfaction of a standing desire of the person, even if, for a variety of possible reasons, the person was unaware that her desire had been satisfied and thus never experiences any pleasure or satisfaction as a result. Still, these are subjective theories in that, as Brink puts it, “they do hold value to depend importantly on people’s psychological states” (Brink 221), if only in the sense that they would maintain that, were the person to become aware of the fact that her desire had been satisfied, she would experience an intrinsically valuable mental state.15

Actual desire-satisfaction theories hold that what is valuable is the satisfaction of one’s actual desires. The plausibility of this theory resides in the obvious facts that, for the most part, the satisfaction of desires is a good thing and people obtain pleasure from the satisfaction of their desires. But many people have desires that are irrational, inconsistent, evil in nature, or based on misinformation or partial information. Holding that the satisfaction of such desires, where that is even possible, adds value to the world strikes many as counterintuitive.

For such reasons, some have argued for what Brink calls counterfactual desire-satisfaction theory.16 Counterfactual desire-satisfaction theory “claims that what is valuable is what would satisfy one’s desires in some preferred epistemic position, for instance, if
one’s beliefs and desires were consistent and one’s desires were based on full (nonevaluative) information” (Brink 221). While this form of the desire-satisfaction theory takes account of problems with actual, standing desires, it still strikes many as implausible for other reasons. According to the theory, satisfying some actual desire might not add value to a life, if that desire is not one the person would retain under conditions of, for example, full information. On the other hand, one could add value to a life by doing something that, counterfactually, satisfied a desire that a person could never have because the full information necessary for the person to acquire that desire was unattainable. One might feel at this point that the limits of desire-satisfaction theory have been pressed too far and the central insight, that it is valuable to satisfy people’s desires, has been lost.

As noted above, objective theories of intrinsic value deny the central claim of subjective theories that there is a link of some sort between what is intrinsically valuable and psychological states of any sort. These theories hold that there are certain things, which as a matter of fact, are valuable independently of any relation to the psychological states of humans or other sentient beings. The existence of these valuable things adds value to the world; the possession of these things by a person may (but depending on the type of value, may not) add value to her life. But neither of these claims requires that any given psychological state, such as pleasure or satisfaction or a heightened state of consciousness, obtain.

Impersonal theories of both the life-enhancing and life-irrelevant sort will qualify as objective theories. Theories of life-irrelevant impersonal value are clearly objective. Theories of life-enhancing impersonal value are also objective in that the value that a good with life-enhancing impersonal value brings to a life does not need to be associated with any particular psychological state, certainly not one, such as pleasure, that would itself be a candidate for being valuable. Certain forms of personal theory will also be objective. As Brink notes, “personal theories that claim a valuable life consists in the possession of certain character traits, the exercise of certain capacities, and the development of certain relations with others and to the world, and that the value of such a life is independent of the pleasure it contains and whether or not this sort of life is desired or would be desired in some preferred epistemic state” are objective theories (Brink 221). Brink sketches a theory he calls objective utilitarianism that is of this sort.

Moore’s theory of the intrinsic value of the beautiful would be an objective theory of a life-irrelevant impersonal form. So would the views of environmentalists who attribute non-economic, non-anthropocentric value to nature and thus hold that nature is intrinsically valuable, quite independently of human beings. Aristotle’s virtue theory and its modern variants would be examples of life-enhancing impersonal, objective theories. Many would categorize Nietzschean perfectionism in this way as well. What I will argue is that nature has intrinsic value, suitably understood, over and above its instrumental value. But the intrinsic value I wish to accord nature is of an life-enhancing impersonal, objective sort. Before I make this argument, however, one last distinction needs to be made, this one concerning different senses associated with the concept of intrinsic value.
TWO SENSES OF INTRINSIC VALUE

Discussions of intrinsic value often merge together two meanings associated with that concept: the idea of something being valuable independently of everything else, or in itself, and the idea of something being valuable as an end, or for itself. The first sense of intrinsic value, value in itself, is generally unpacked in terms of intrinsic properties. Intrinsic properties are nonrelational, that is, they are the properties an object has in virtue of its own nature and not in relation to any other object. Intrinsic properties are often said to be the properties an object would have even if it were the only object existing in the universe. Examples of intrinsic or nonrelational properties might include shape or mass. Extrinsic or relational properties, in contrast, would include “larger than” and “to the left of.” According to the first sense of intrinsic value, if an object has intrinsic value, then this value must either be an intrinsic property of the object or it must depend on the object’s intrinsic properties. The source or location of the value must be in the object itself. Thus, an object with intrinsic value, as it is generally understood, would have this value even if it were the only object existing in the universe.

The standard contrast, discussed above, between intrinsic and instrumental value typically contrasts valuing something for itself, or as an end, and valuing something for the sake of something else, or as a means. If the two meanings associated with the concept of intrinsic value are not clarified, one can easily fall into the conclusion that anything that is valued as an end is so valued only in virtue of its intrinsic properties, and likewise, anything valued in virtue of its intrinsic properties must be properly valued as an end. On this view, if something were valued instrumentally, valued as a means, then its value must be extrinsic, based on a source other than itself, and thus be based on relational properties such as “being useful to” or “causing to be brought about.” It would then follow that anything that is valuable only in relation to human beings and their interests, for instance, something that is valuable only when properly regarded or related to by a person, can have only instrumental value and cannot be properly regarded as an end in itself since the source of value in this case would be in the person or the object’s relation to the person and would thus be extrinsic.

Christine Korsgaard argues that unfortunate consequences follow if the two concepts of value, value as an end and value based on intrinsic properties, often merged together in the term, intrinsic value, are not carefully separated. According to Korsgaard, there are in fact two distinctions that we need to respect. The first is “the distinction between things valued for their own sakes and things valued for the sake of something else—between ends and means, or final and instrumental goods. The other is the distinction between things which have their value in themselves and things which derive their value from some other source: intrinsically good things versus extrinsically good things” (Korsgaard, 1983, 170). Korsgaard wishes to reserve the term, intrinsic value, only to value that resides in things in themselves, where the source of value is the object’s intrinsic properties. Things that are valuable for their own sakes, or as ends, have what Korsgaard refers to as final value.
Korsgaard notes a number of problems that follow if these distinctions are conflated. The part of Korsgaard’s argument in which I am particularly interested here concerns “the equation of extrinsic with instrumental goods, or means” (Korsgaard, 1983, 171). Given Korsgaard’s understanding of intrinsic value, an object or activity with intrinsic value has that value under all conditions. If an object or activity appears not to be valuable in all circumstances, not to retain its value under all conditions, then its value must be extrinsic—“it is derived from or dependent upon the circumstances.” As Korsgaard notes, “If extrinsic value and instrumental value are equated, you are then forced to say of all such things that they are means or instruments” (Korsgaard, 1983, 171). The danger she sees lurking in this move is that it naturally leads to identifying final value—value as an end, value for itself or for its own sake—with pleasure or more broadly, with a mental state or state of consciousness, that is, it leads to subjectivism.

Her argument is as follows:

Take an activity that we would naturally say is valuable for its own sake,—say, looking at a beautiful sunset. Now the question is raised: would you think this activity was a good one even if the person engaged in it found it tedious or painful? If you say “no” then you have admitted that the goodness of this activity is not intrinsic; that it depends, in some way, on the pleasantness of it. But if all extrinsic value is instrumental value, then the only option is that the activity is a means to pleasure (Korsgaard 172).

If an object or activity is such that, while most people find it valuable, some find it painful, tedious, distasteful or the like, something generally opposed to pleasure or satisfaction, then the conclusion is, given the conflation of the two distinctions, that the value cannot reside in the object or activity itself, cannot be intrinsic. If the value were intrinsic, it would be retained under all circumstances. Since the value in such cases is not intrinsic, it must be extrinsic and hence instrumental. But then the value of the object or activity must be as a means to some intrinsically valuable end. If the insight we started with is that the object or activity is not valuable in certain instances because it is painful or tedious or the like, the obvious candidate for that which is intrinsically valuable, the end that the object or activity often furthers as a means, is pleasure or some related mental state. The easy assumption to make here is that all people seek pleasure as an end and that pleasure is the only intrinsically valuable end. In the case in point, many derive pleasure from the object or activity in question and so the object or activity serves as a means; some do not. For those who do, the object or activity has instrumental value; for those who do not, the object or activity has no value. Thus, we arrive at a classically subjectivist view.

Korsgaard’s unhappiness with this conclusion, a form of hedonism in the version of the argument she presents, is that it closes off the possibility of a Kantian theory of value that she endorses. Without wishing to explain and concur here with her endorsement of Kantian theory, I want to use a result that follows from the separating of her two distinctions. As she puts it, clarifying these distinctions in value theory “opens up another
possibility [that is closed off by the subjectivist argument above]: that of something which is extrinsically good yet valued as an end. An example of this would be something that was good as an end because of the interest that someone took in it, or the desire that someone had for it, for its own sake” (Korsgaard, 1983, 172). Furthermore, something might be extrinsically valuable yet valued as an end not because of how it could be used, nor because of the interest someone took in it or the desire that someone had for it but because it would be in that person’s interest to so value it, that is, because the person had good reasons to value it as an end. Valuing it, taking it as an end such that one has reasons to adopt certain attitudes and take certain actions towards the valued object, would add value to the person’s life. Nature, I want to claim, is properly regarded in this way, as extrinsically valuable but as an end, for its own sake.

III. THE VALUE OF NATURE

WHAT IS THE VALUE OF NATURE?

I stated above that I would argue that nature has intrinsic value in addition to its instrumental value and that this intrinsic value is of a life-enhancing impersonal, objective sort. Over and above its uses to humans, nature has a value that when properly appreciated allows nature to serve as an appropriate end in itself for human actions. This appreciation of nature’s value involves having a relation to nature that adds value to one’s life, but not necessarily to one’s well-being; and this value does not depend on or consist in any important way in any psychological state such as pleasure or desire satisfaction.

While the value of nature cannot be reduced to a psychological state, as the subjectivist would have it, I want to maintain, nonetheless, that there is an insight associated with the traditional subjectivist view that is correct: nature does not have value independently of human beings. Rather, its value is relational, it is value for us. Brink’s distinction between theories of personal and impersonal value allows this insight to be separated off from the core of the traditional subjectivist view concerning the centrality of particular psychological states. The value of nature gives us reason to adopt certain attitudes expressed in psychological states and behaviors. We value nature, appreciate and realize the value of nature, by admiring it, even respecting it, perhaps being in awe of it, and certainly by protecting and preserving it. The value of nature, however, does not consist in or depend on any of these states as such. Nevertheless, without humans who could adopt these attitudes and relations to nature, nature would have no value. The life of a person who does adopt these attitudes and relations to nature, nature would have no value. The life of a person who does adopt these attitudes and relations to nature, nature would have no value. The life of a person who does adopt these attitudes and relations to nature, nature would have no value.
However, in light of Korsgaard’s separation of the two distinctions of value, instrumental value versus final value, and extrinsic value versus intrinsic value, I must amend my analysis of the value of nature somewhat. Again, nature has instrumental value. That has never been disputed. But over and above its instrumental value, in virtue of which we use parts of nature as means to our ends, I now want to say nature has final value, value as an end for itself or for its own sake. This final value of nature cannot be understood in terms of the uses of nature to satisfy our desires or to bring us pleasure. But this final value, following Korsgaard’s distinction, is extrinsic, not intrinsic value. Nature does not have intrinsic value in the restricted sense that Korsgaard stipulates for that term. That is, as I have said, the value of nature depends on the relations humans have to nature, the ways in which properly relating to nature adds value to a life. The value does not reside in nature independently of human existence, in nature’s intrinsic properties, in the nature of nature, so to speak, except insofar as these properties allow us to properly take nature as an end. Furthermore, I wish to maintain that this final value of nature is life-enhancing, impersonal and objective in the senses discussed above. In order to explain why I want to maintain this understanding of the value of nature, I will contrast it with how the economist and the environmentalist understand it.

THE VALUE OF NATURE IN ECONOMICS

Standard economic theory assumes a theory of value that is personal and subjective, to use Brink’s terms. Economics is the study of how human beings, organized in societies, provision themselves with the goal of increasing human well-being. The basic premises of the field include “that the purpose of economics activity is to increase the well-being of the individuals who make up the society, and that each individual is the best judge of how well off he or she is in a given situation” (Freeman, 1983, 307). This last premise concerns what is called “consumer sovereignty”: “that consumer choices are paramount, and that individual consumer preferences, whatever they happen to be and however they are formed, should determine relative value. This rule embodies the assumption that tastes and preferences are fixed [exogenously] and that the economic problem consists of optimally satisfying those preferences” (Costanza and Folke 53). The implicit, sometimes explicit, theory of intrinsic, or more appropriately, to use Korsgaard’s term, final value is that the only thing that has final value is human well-being. Overall human well-being is then understood in terms of the aggregate well-being of the individual consumers in a society, and individual well-being is understood in terms of the satisfaction of (revealed) preferences (or alternatively, desires). In Brink’s terms, economics holds an actual desire-satisfaction theory. The more the preferences of an individual are satisfied, the greater that individual’s well-being and hence the greater the value of that life. Things other than well-being have value insofar as they contribute to the satisfaction of the preferences (and thus increase well-being) embodied in the attitudes and actions of consumers. That is, things other than well-being can have only instrumental value.

Three further assumptions made by conventional economics should be noted. The first is scarcity on both the individual and social levels. Not all of an individual’s preferences
can be satisfied. Choices must be made. The theory of individual rational choice used by economics assumes “that each individual has preferences over alternative bundles of economic goods and services. In other words, the individual can rank all of the alternative combinations of goods and services he can consume from most preferred to least preferred...We assume that individuals act so as to obtain the most preferred (to them) bundles given the constraints imposed by technology and the availability of the means of production” (Freeman, 1983, 307). On a social level, scarcity means that we live in a world of limited resources, and choices must be made about which resources are to be used by whom, how and at what rate. In a market society, these decisions about scarce resources on the social level are in effect made through the aggregation of individual consumer choices in the market.

The other two assumptions to be mentioned involve properties that the preferences of individuals are assumed to have: “substitutability among the components of bundles and the absence of limits on wants” (Freeman, 1983, 307-8). The assumption of substitutability means that two bundles of economic goods can be adjusted so that the value of an item in bundle A that is lacking in bundle B can (more than) be made up for by adding to the value of other items in bundle B— “the individual can be compensated for the loss of some quantity of one good by increases in the quantities of one or more of the other goods” (Freeman, 1983, 308). The assumption of the absence of limits on wants (unlimited wants) holds “that for any conceivable bundle A, it is possible to describe another bundle B with larger quantities of one or more goods such that an individual would prefer B to A” (Freeman, 1983, 308). Our wants or desires for goods are unlimited and cannot (with certain exceptions perhaps) be completed satiated, so adjustment and comparison of bundles is always theoretically possible.

Given this theory of value and the associated assumptions, nature can have value only insofar as it serves the purposes of increasing human well-being through satisfying consumer preferences; that is, it can only have instrumental value. Furthermore, given the assumption of substitutability, the instrumental value of nature is commensurate with other forms of instrumental value. Thus, a loss in an ecosystem service or good provided by nature (as part of bundle A) can be compensated for by increasing the amount of some other form of instrumental value (in bundle B). If bundle A, with an ecosystem good or service provided, and bundle B, without the same amount of the ecosystem service or good but with adequate compensation in the form of the instrumental value of some other consumable, each represented the same amount of preference satisfaction and well-being, then it would be rational for the individual to be indifferent between them. And given the assumption of unlimited wants, it is always possible to find a bundle B in which the loss of the ecosystem good or service that is in bundle A is welcomed in the sense of rational to choose since bundle B represents greater well-being.

But, it might be objected, what about ecosystem goods and services that are essential to human well-being such that their loss cannot be compensated for by increasing other forms of instrumental value? Aren’t there ecosystem goods and services so essential that
it would never be rational to prefer a consumption bundle that did not include them? Don't these ecosystem services, that is, challenge the assumptions of substitutability and unlimited wants?

At the extreme, a total loss of an essential good or service provided by nature could mean the collapse of human well-being such that no compensation could make up for the loss. But this would be only at the extreme. A marginal loss of an ecosystem service or good would mean at most a measurable loss of instrumental value, and such a loss could in theory be compensated for. Also, there is the possibility of technological substitutes for nature's services and goods. Provided certain conditions are met, human engineered systems could in principle provide the same or equivalent goods and services as natural systems and thus the same instrumental value. From the point of view of economic theory, as long as the two systems, the natural and the artificial, provided the same instrumental value in terms of promoting human well-being, it would be rational to be indifferent between them.32

Is there anything wrong with valuing nature in the way that economic theory does? Are there good reasons why we should not treat nature, its goods and services, merely as part of a commodity bundle with all the ensuing trade-offs and comparisons? In fact, this view of the value of nature embodied in conventional economic theory is inadequate to the full range of ways we do value nature. We are left uncomfortable by the idea that nature represents nothing but another source of desire satisfaction. Attitudes we typically have towards nature, including awe, wonder, admiration, concern and respect, point to ways in which we value nature that cannot be captured solely in economic terms. We tend to criticize people who lack these attitudes as crass, insensitive or blind to the true nature and value of nature. And this lack, in turn, is one we judge as diminishing the value of such people's lives.33

As an analogy, consider friendship. Good friends are valuable because of the help they might lend us in our efforts to satisfy our preferences. But seeing the value of friendship entirely in these terms not only misses much of what is valuable in the relationship but in fact distorts the proper attitudes one should have towards one's good friends, if one in fact is to be a good friend in return. This is a basic point made by Aristotle. As John O'Neill summarizes it: “It is constitutive of friendship of the best kind that we care for friends for their own sake and not merely for the pleasures or profits they might bring. To do good for a friend purely because one thought they might later return the compliment [and] not for their own sake is to have an ill-formed friendship” (O'Neill, 1992, 133).

So, the argument goes, the same is true of our proper valuing of nature. To see the value of nature merely in economic terms is to miss something important about nature and our relation to it. Economic theory may be a good account of the instrumental value of nature and how we realize this value in relation to our ends.34 But it does not provide a complete theory of the value of nature.35 John O'Neill and Robert E. Goodin each
present an argument to a similar point as mine above. O’Neill draws on Aristotle and Marx to connect a concern for nature as an end with human well-being and the human-ization of senses (O’Neill, 1993, especially Chapters 2, 5 and 9). Goodin argues for nature as having value as an end in itself by appealing to the way in which nature can provide a context against which humans can find meaning in life (Goodin 37-41).

Economic theory is inadequate in another way as well. Nature, I have argued, has final value, that is, value as an end in itself above and beyond its uses with regard to satisfying human desires. Economic theory takes human well-being as the only thing that has final value (and perhaps even intrinsic value). But the final value of nature, nature’s value as a human end, does not rest in relation to human well-being. This value of nature, I have argued, is life-enhancing, so that when related to properly, it adds value to a life. But this value is impersonal, where, as I use the term, this means that the value added to a life cannot be conflated with increased well-being. Economic theory has no way of registering this addition of value. This distinction will take on greater import in my discussion of cost-benefit analysis below.

THE VALUE OF NATURE IN (A CERTAIN FORM OF) ENVIRONMENTALISM

In my introduction, I said that many environmentalists want to attribute non-economic, non-anthropocentric value to nature. Such a statement is so general as to be of almost no use. Environmental philosophers who have explicitly addressed the problem of the value of nature have taken a wide range of positions. First of all, one must specify what parts of nature are of concern. Given the sense of nature I said in section I I would be using, nature as the entire non-human world, everything from other primates to other sentient animals to plants to holistic entities like species and ecosystems to the biosphere as a whole would be included as parts of nature. Within this range of entities, environmental philosophers have staked out a number of positions on what has intrinsic value. Perhaps the three most important positions are sentientism, biocentric individualism and holism.36

The Value Of Nature In (A Certain Form Of) Environmentalism

This is not the place to discuss the issues and problems of this increasingly sophisticated discourse in environmental philosophy. My concern here is with a particular kind of position on the value of nature that many of the participants in the philosophical debates hold in different ways and to various extents. What all variations on this position hold in common, however dissimilar they are otherwise, is that at least some parts of nature have, as I stated it in the introduction, non-economic, non-anthropocentric value. Having worked through my analysis of the concept of value, I can rephrase the core point of this position: nature, or some parts of it, has life-relevant impersonal, objective, intrinsic value. That is, at least some things in nature, be they other sentient beings or nature as a whole, are valuable in themselves, independently of human beings and any contribution they may make to the value or well-being of human lives, and hence their value does not consist in or depend on any human psychological states. In describing this position I use the term “intrinsic value” deliberately with Korsgaard’s distinction in
mind. The position I am characterizing holds that the value of whatever part of nature is seen as valuable in this way has that value in virtue of its intrinsic properties and not in virtue of any relations it might have to human beings. For the sake of simplicity, I will refer to this position as that of the environmentalist, all the qualifications understood.

I claimed above that positions such as that of the environmentalist involved what I called a metaphysical excessiveness and hence violated the principle of methodological conservatism, a principle I think should guide our deliberations in areas such as value theory where competing claims are so abstract and elusive. Furthermore, I agree with Brink’s rejection of theories of impersonal value, or more specifically, to invoke my distinction, of life-irrelevant impersonal value. As Brink makes the point, to quote him again, “it seems hard to believe that things might be of intrinsic value that made no contribution whatsoever to anyone’s well-being” (Brink 219). I would want to restate his point so that it talked of making no contribution to the value, not the well-being, of anyone’s life. But the point, as a criticism of the environmentalist here, remains. Among other problems, there is the question of motivation. One normally associates with the concept of intrinsic value the idea that we have some motivation or reason to promote, or perhaps, preserve, that which has intrinsic value. This idea seems implicit in the recognition of something as valuable, as having value. Yet, if something were intrinsically valuable but made no contribution to the value of anyone’s life, it is hard to see why we should care about it. The value would seem removed and abstract in a way that does not hook up correctly with our interests and motivational states. By talking about nature as having final value of a life-enhancing impersonal sort, we are in a better position to address this problem.

I noted above that there is an insight associated with the traditional subjectivist view that is correct; similarly, there are two insights that the environmentalist has that are important. The first is associated with the environmentalist’s objectivism and is a point to be made against the economist qua subjectivist. Korsgaard states the point well:

> The advantage of objectivism is that it explains certain of our beliefs about the good that a subjectivist account cannot readily accommodate. We believe that people sometimes fail to care about what is good and sometimes have interests in or desires for things that are not good. Yet in subjectivist theories it seems as if anything one enjoys or desires is good at least ceteris paribus, and anything one does not enjoy or desire is not (Korsgaard, 1986, 486-7).

We want to say that something may be good or valuable even though no one takes pleasure from it or desires it, and something may be bad even though many may enjoy and desire it. Insofar as the economist assumes an actual desire-satisfaction theory of value, she cannot allow this distinction.

The other insight to be preserved in the environmentalist’s view is that nature has a value that cannot be reduced to mere instrumental value. Nature, or some parts of it, is properly regarded as an end in itself. When we do not recognize this, we risk undermin-
ing the value that nature has. This insight is what is behind the oft stated point that nature is not merely a resource for the satisfaction of human desires, and that we are liable to run into serious problems if we do not embody this point in our behaviors and policies. However, the environmentalist gets it wrong in thinking that this value resides in the very properties of nature, that is, is intrinsic value. Here, once again, Korsgaard’s distinction is crucial. What makes nature properly regarded as an end is its final value, not intrinsic value. And its final value is properly understood in terms of its extrinsic properties, the conditions of its contribution to the value of human lives. That is what makes it valuable.

IV. THE VALUE OF NATURE AND COST-BENEFIT ANALYSIS

It is time to return to the Costanza et al. study. As I mentioned in the introduction, the Costanza et al. project was not itself a cost-benefit analysis but does, as the authors admit, lend itself to such analysis. The primary motivation behind their study was to show how we grossly under-appreciate the value of nature in policy decisions, and if more realistic estimates of the value of ecosystem goods and services were used in such decisions, the relative balance of costs and benefits would change drastically with the result that many policies would presumably look very different. The point I want to focus on in conclusion concerns the limits of cost-benefit analysis with regard to the concept of the value of nature it assumes. These limits are felt whether the goal is to estimate the total global value of nature’s goods and services, as Costanza et al. do, or to focus on the value at the margins of a particular ecosystem good or service. The limits are due to the fact that cost-benefit analysis does not allow us to bring into the decision-making process the type of value that I have been arguing nature has over and above its instrumental value. In turn, the question that the cost-benefit analyst throws back at me is, how then are we to make decisions?

When cost-benefit analysis is used to make public policy decisions, its role is to mimic the outcomes a market would produce if all goods involved had market prices and could be freely negotiated in the market. As Elizabeth Anderson states it: “Cost-benefit analysis is the state’s way of mimicking the consequences of market transactions” (Anderson 192). The concept of value assumed by cost-benefit analysis, then, is the same as that incorporated into conventional economics and its theory of the market. As I have argued above, this approach results in conceiving of nature as having only instrumental value. The instrumental value of nature or its parts is expressed in cost-benefit analysis as the price of a commodity, where an object or good is treated as a commodity “if it is valued as an exclusively appropriated object of use and if market norms and relations govern its production, exchange, and distribution” (Anderson 193). The price or economic value of the commodity is established in those cases where an actual market price is absent by various methods of contingent valuation that are used to determine the willingness-to-pay on the part of the individuals involved. The willingness-to-pay for a good, service or project on the part of an individual is taken to represent the value of that
good, service or project to that individual, or in other words, how much preference satisfaction and hence well-being obtaining the good, service or project, or avoiding its lost, represents to that individual.\textsuperscript{42}

Cost-benefit analysis, as a method for public decision-making, operates with the same incomplete theory of the value of nature as does the economic theory of which it is an offspring. As such, it is open to the same criticisms as the larger theory as discussed above. With cost-benefit analysis, however, the implications of this deficiency in the theory of value threaten to become real consequences. If natural goods and services are treated as commodities similar to other commodities in a consumer’s bundle, then these goods and services are open to the various trade-offs and comparisons mentioned above in the discussion of the assumptions of substitutability and unlimited wants. The preservation of parts of nature could fall victim to the results of contingent valuation techniques that showed that it was better, assuming compensation, hypothetical or actual, to commercially develop an area than allow it to be preserved in its natural state. Or technological substitutes for natural goods or services might be found to be more cost-efficient and hence productive of more human well-being.\textsuperscript{43}

I do not want to argue that in all such cases, not preserving nature would be wrong. Such cases are often complicated and difficult and resist generalization. My point, rather, is that it is wrong to allow cost-benefit analysis to determine all of these decisions, and the evidence is that we feel that not all of such cases can be right, despite the results of the cost-benefit analysis. The reason that cost-benefit analysis fails in some cases to produce the right result is that it cannot take into account all of the value of nature, its final value as well as its instrumental value.

The proponent of cost-benefit analysis will undoubtedly be unsatisfied with my argument here. Why can’t people express the value nature has for them as part of their willingness-to-pay? If nature has final value over and above its instrumental value, why can’t this value be reflected in the tally of costs and benefits? In fact, in response to the problem that the normal categories of cost-benefit analysis that captured instrumental value were perceived to be too closely tied to the idea of use and consumption (use value), and with the realization that people valued things for their existence and not only for their use, cost-benefit analysts devised the category of existence value. Why can’t the category of existence value be used to incorporate what I have been calling the final value of nature into cost-benefit analysis?

These are good questions to be sure and I can give only an incomplete answer here. I will make two points, one about the problem of measurement and one about the coherence of the category of existence value.

How is existence value to be measured? Assume a part of nature that in addition to supplying ecosystem services (a wetlands that is a site for fish spawning and water cleansing, for example) is valued for just being what it is, for just being there. The exist-
ence value of the wetland would not seem to be a marketable good or related to any marketable good, so thinking about the prices of other goods would be of no help. Existence per se is not properly thought of as a service supplied by the object that is comparable to any other service. The chief method of valuation, then, must be the use of questionnaires—asking people how much they would be willing to pay to keep the wetland in existence, or being willing to receive in compensation for its lost.

Willingness-to-pay as a criterion of value, however, has been subject to a wide array of criticisms, and these seem to take on added force when applied to something as abstract as existence value. To just mention two, some have argued that there is a difference between how people value things privately in their roles as consumers aiming at increasing their well-being and how they value the same things publicly as participants in civic debates on public policy. Willingness-to-pay may be an especially poor way of capturing the latter point of view, yet final value is just the sort of value that may be best appreciated and expressed in public, communal deliberations. In the words of one critic:

Cost-benefit analysts slip into their analysis an important and controversial value judgment, growing naturally out of the highly individualistic microeconomic tradition—namely, the view that there should be no difference between private behavior and the behavior we display in public social life. An alternative view—one that enjoys, I would suggest, wide resonance among citizens—would be that public, social decisions provide an opportunity to give certain things a higher valuation than we choose, for one reason or another, to give them in our private activities (Kelman 38).

Furthermore, there is evidence that people resist putting a monetary value on the continued existence of natural objects and in fact reject the very terms of the question. And this would make sense in light of my understanding of the final value that I impute to nature. Some forms of value simply cannot and should not be convertible into monetary price. This point is most famously made by Kant. “In the kingdom of ends, everything has either a price or a dignity. Whatever has a price can be replaced by something else as its equivalent; on the other hand, whatever is above all price, and therefore admits of no equivalent, has a dignity” (Kant 40).

The second point I wish to make concerns the very coherence of the category of existence value and in particular, the relation of existence value to well-being. For the most part, existence value is connected to human well-being. For instance, in one account it is explained as a form of nonuse value, that is, a kind of value that does “not involve any actual direct or indirect physical involvement with the natural thing in question.” In particular, existence value is said to be “the satisfaction one enjoys from the mere contemplation of the existence of some entity.” Insofar as satisfaction is seen as a measure of, if not identical to, a person’s well-being, existence value is connected to well-being. Thus, the satisfaction one gets from having one’s preference for the continued existence of a natural object is comparable to and commensurate with the satisfaction one gets from the consumption of any use-value. This is what one would expect,
given the theory of value assumed by economics, and in particular, the stipulation that the only thing with intrinsic value is human well-being.

If existence value is connected to human well-being, however, it cannot be used to access or be a measure of what I have called life-enhancing impersonal objective final value. To explain this concept again, insofar as nature has this form of value, it is properly taken as an end in itself and doing so adds value to a person’s life, but not necessarily to her well-being, and is quite independent of the person’s psychological states. That is, the form of value I wish to attribute to nature cannot be captured by categories that are at bottom a measure of human well-being. Existence value is part of the value nature has with regard to human well-being; life-enhancing impersonal objective final value is not. If this is so, it is possible for a person to be willing to pay a certain amount to allow the continued existence of a certain part of nature, and do so for the satisfaction she will receive from the knowledge that that part of nature still exists, and yet feel that that part of nature has more value than has been expressed in her payment. Likewise, a person might be willing to sacrifice his well-being on behalf of a part of nature he perceives as valuable in itself. His sacrifice of well-being might far out weigh any gain in satisfaction and hence well-being he might get from the existence value of the natural object. Yet, this action might, as I am describing it, increase the value of his life even while diminishing his well-being.

To get around this problem, the cost-benefit analyst might attempt to disconnect existence value from well-being. Existence value in that case would be value assigned to the continued existence of an object over and above the value one might receive from the satisfaction of knowing the object still existed. The problem with this concept in the context of cost-benefit analysis is that it is hard to see how it could be commensurate with the other categories of use and nonuse value used. All the other categories are meant as a measure of and take meaning from increasing human well-being. That is what makes the decision to accept the result of a cost-benefit analysis seemingly rational; it points the way to maximizing human well-being. If existence value is defined so that it neither increases nor decreases well-being, it is not clear how it can be incorporated into the analysis.

If I am correct in claiming that nature has a form of value that resists incorporation into cost-benefit analysis, and that in particular, existence value fails as an attempt to capture the intuition that we value nature beyond its instrumental value, then the cost-benefit analyst still has a difficult question to confront me with. If cost-benefit analysis proves inadequate, how are we to make decisions about public policy that reflect and respond to the true nature of the value involved? If final value of the sort I am attributing to nature cannot be measured by the methods of cost-benefit analysis, how can we resolve conflicts across incommensurate values?

This is a very serious challenge and I cannot take it up here in depth. One reply would be that we assign a lexicographical ordering such that final value assumes priority over human well-being in certain instances. Obviously, working out an appropriate scale here
would be very difficult to say the least. Another move might be to look for an overarching “covering” value in terms of which both well-being and the final value of nature could be brought together. Some have argued that without such a covering value, no comparisons, even of better or worse, can be made. And without comparisons, it is hard to see how we could make rational decisions, at least on the traditional model of such decision-making. But it is equally hard to see what such a value could be. Alternatively, it has been suggested that we turn away from the traditional model of a rational decision-making procedure such as cost-benefit analysis and look instead to a more Aristotelian model of phronesis, where we rely more on wisdom and good judgment rather than rules and weightings. This is in effect to suggest we alter our dominant model of practical rationality.

On a more practical level, the suggestion that we turn to a more Aristotelian model of practical reason in the public sphere has been taken by some to mean we should move towards a different structure of public decision-making where the emphasis is on democratic forums where reasons rather than preferences are the determining factor. In such a forum, there would be no pressing need to measure and weigh the intensities of seemingly incommensurate values; rather, arguments about social norms, attitudes and the nature of values might prove persuasive enough to allow consensus around important policy proposals.

Each of these options, and others, needs to be examined in detail and its various strengths and limits debated. However these issues are resolved, we must continue to be alert to how we value, and thus how we treat, nature.
NOTES

1. The Biosphere experiment is the most ambitious attempt to date to sustain human and other life in a largely artificially structured environment. As is well-known, it proved a failure within two years. See Baskin 207-09. The thought experiment mentioned above is a generalized version of one discussed by Gretchen Daily, and originally suggested by John Holdren, concerning what parts of nature we would have to bring along if we were to successfully colonize the moon (Daily 3).

2. See, for example, the collection of essay edited by Gretchen C. Daily.

3. See Costanza et al. For a related attempt, see Pimental et al.


5. Quine invokes something like a principle of methodological conservatism in his discussions of radical translation and the revision of conceptual schemes. See Quine, p. 20, where he explains conservatism as a criterion of theory revision as “a favoring of the inherited or invented conceptual scheme of one’s own previous work.” Also see Quine 14, where he talks about “a maxim of minimum mutilation.”

6. Consider, for instance, this typical example of how they use ‘value’: “As natural capital and ecosystem services become more stressed and more ‘scarce’ in the future, we can only expect their value to increase” (Costanza et al, p. 259, my emphasis).

7. See the footnote on page 5 of Passmore.

8. See Brink, pp. 217-236.

9. As a limited analogy to the sequence of instrumentally valuable things that ends in something that is intrinsically valuable, consider a journey. A journey has a terminus. The journey may take you through a number of temporary destinations, but the point of going to each temporary destination would only be as a means to reach the final terminus. Without a final destination, you would have no reason to go to any of the temporary stops. The analogy is limited in that one might want to undertake the journey just for the sake of traveling and not care where one went, that is, have no terminus in mind. But then the response would be that the journey itself had intrinsic value. Also, it is worth noting that it is possible for something to have both intrinsic and instrumental value, to be valuable in itself and to be of value in bringing about something else that is valuable in itself.

10. See Moore, pp. 85 and 189. Moore terms his method for answering the question of what has intrinsic value the method of isolation: “In order to arrive at a correct decision on the first part of this question [what things have intrinsic value], it is necessary to consider what things are such that, if they existed by themselves, in absolute isolation, we should yet judge their existence to be good” (Moore, p. 187). Also see p. 91.

11. Scanlon is working with a complex concept of well-being here. As he summarizes it, “The intuitive notion of well-being that I am concerned with, then, is an idea of the quality of a life for the person who lives it that is broader than material and social conditions, at least potentially broader than experiential quality, different from worthiness or value, and narrower than choiceworthiness all things considered” (Scanlon, pp. 112-13)

12. One might ask why I distinguish two forms of impersonal value, life-enhancing and life-irrelevant, rather than make effectively the same point by distinguishing two forms of personal value, that which increases the well-being of a life and that which increases the value but not necessarily the well-being of the life. This question gathers force in the face of the admittedly ungainly terms I employ, terms that may even embody a tension (life-enhancing and impersonal). In defense of my distinction I would make two points. First, the point I wish to make below in the context of the Costanza et al. study about the limits of economists’ notion of value are more cleanly made with my distinction, given the close connection between intrinsic value and well-being typically made by economists. Second and more substantively, the core intuition that has dominated the discussion of these issues in the literature connects what Brink calls theories of personal value with well-being taken largely in an experiential sense. Thus, there is a more than casual connection between theories of personal value and subjective theories as discussed below. Brink recognizes this. See his discussion of the dominance of subjective theory and his defense of objective theory in Brink, 1989, pp. 222-231. This comparison being the case, Brink’s defense of a form of an objective theory of personal value is difficult enough without my imposing a distinction on it of different kinds of such theories. As for the awkward terminology I use, I wanted to build off of Brink’s useful classification of theories of value and thus found myself somewhat limited by his terms.

13. My agreement with Brink on this point may be no more than an expression that I share his intuition, but there is often not much more to go on at this sort of level than intuition. The principle of methodological conservatism at least points to where the burden of proof properly lies.

14. Although Brink does not note this distinction, it is probably best to see hedonistic theories—there are various forms that hedonistic theories can take—as a subset of mental state theories. For a close and interesting discussion
of such theories in the context of a general discussion of well-being, not of value per se, see Kagan, 1998a, pp. 29-41.

15. Strictly speaking, there could be a variant of desire-satisfaction theory that would properly be regarded as an objective, not a subjective, theory. Such a theory would hold that there was no important relationship between the satisfaction of desires and any intrinsically valuable mental states. In such a theory, what would add value to my life would be the mere fact that my desires had been satisfied, and not my experience of the desires having been satisfied. Whether I knew that my desires had been satisfied, and whether I experienced any pleasure or satisfaction as a result of their being satisfied would be irrelevant to the value of my life on such a theory. So, for instance, if I desired that all the members of my family prospered in life, the fact that they did so would mean my desires had been satisfied and my life made more valuable as a result, even if I had lost all contact with the members of my family and had no knowledge of or connection to their prospering. Even if I were to become aware of their prospering and feel great pleasure or satisfaction as a result, that would not, on such a theory, add any value to my life over and above the value my life obtained from the fact that their prospering had satisfied my desires. In addition to the apparent implausibility of this view, it would no longer be a subjective theory for the necessary connection to psychological states would have been severed.


17. An act or a relationship that adds life-enhancing impersonal value to a life (not related directly to the person’s well-being) may require a sacrifice that brings about or is normally associated with unpleasant and even painful psychological states, states that clearly do not add to a person’s well-being. If something with life-enhancing value were associated with a particular psychological state that presumably was itself valuable, it is hard to see why we would not want to say that this value increased a person’s well-being. Hence, this position would collapse into a form of a subjective theory of personal value.

18. We must be careful in how we read Brink’s use of “valuable” in this passage. Given the distinction between well-being and value I made above, I think the best reading is “valuable” as well-being. If “valuable” is read as “valuable as distinct from well-being,” then the point Brink is making is not about personal theories but about what I am calling life-enhancing impersonal ones.

19. Because Brink does not recognize my distinction between theories of personal value and theories of life-enhancing impersonal value, he would categorize Aristotelian virtue theory as a personal, objective theory. I would argue, however, that given the distinction between well-being and value that I use, Aristotle is better seen as a life-enhancing impersonal, objective theorist.

20. This idea is obviously related to Moore’s method of isolation discussed in footnote 10 above. Also see the discussion in Kagan, 1998b.

21. Korsgaard, 1983. Shelly Kagan, in a recent paper, makes a similar argument. In particular, he argues that the substantive thesis, accepted by what he calls the dominant philosophical tradition, “that whatever has value as an end has this value solely by virtue of its intrinsic properties” is false (Kagan, 1998b, p. 279).

22. Terminology here is both critical and confusing. Kagan, making essentially the same distinctions as Korsgaard, stipulates a different use of the terms, insisting on continuing to use the term “intrinsic value” for both senses associated with that concept. “Since I intend to continue to refer to value as an end as intrinsic value, my own favored way of stating my particular thesis is that intrinsic value need not depend solely upon intrinsic properties” (Kagan, 1998b, p. 280).

23. Korsgaard’s larger purpose in this paper is to articulate and defend a rationalist Kantian position on value that is to be distinguished from subjectivism, on the one hand, and Moorean objectivism, on the other. If the two distinctions she differentiates are conflated, subjectivism and objectivism may appear to be the only options. “The terms in which this discussion [at the beginning of the century in which Moore took part] proceeded suggested that the question was whether final goods, whatever we ought to pursue, are intrinsically good and objective, the possessors of a property; or good because they are desired and therefore subjective, or at any rate relational and therefore unfixed” (Korsgaard, 1983, p. 177). Also see pp. 171 and 187. Once the distinctions are clarified, conceptual space opens up for the Kantian alternative. Kant’s theory, she maintains, “both allows for and depends upon the idea of extrinsically valuable ends whose value comes from the interest that people take in them” (Korsgaard, 1983, p. 173). Also see Korsgaard, 1986 for a related discussion.

24. If an object’s intrinsic value depends only on the intrinsic properties of that object, on its nature, so to speak, then as long as the object maintains these properties it retains its value. As Korsgaard puts it, discussing Moore’s views, the intrinsic value “is dependent only on the thing’s intrinsic nature and is just as constant: so long as the thing remains what it is, it has the same value: and the value is the same, of course, for everyone and so also objective” (Korsgaard, 1983, p. 175).

25. In Korsgaard, 1986, she defines subjectivism in a way compatible with Brink’s definition discussed above. “Subjectivism identifies good ends with or by reference to some psychological state. It includes the various forms
26. The objectivist can reply here that the value is retained and the problem is that some people do not correctly perceive or experience the value. Korsgaard, of course, is aware of this move and spends much of her article discussing the objectivist's position.

27. “In particular, when conflation leads us to the conclusion that a thing can only be valued as an end when it is intrinsically valuable, or valuable independently of all conditions and relations, we find ourselves led inevitably to the curious conclusion to which modern moral philosophers are indeed frequently led—that everything good as an end must be something mental, some kind of experience” (Korsgaard, 1983, p. 187). Korsgaard gives a second, related argument for how the conflation leads to subjectivism on p. 187.

28. As stated, this claim is perhaps a little too bald. It might be amended to say that nature would have no value if humans or other rational—or perhaps, sentient—creatures did not exist.

29. There are in fact at least three positions that need to be carefully distinguished from and compared to the one I am developing here; all share a rejection of subjectivism as inadequate. The three are: Moorean objectivism, in which value is a property of the valuable object and is completely independent of human beings and their psychological states; a personal objectivism of the sort that Brink proposes, in which things are valuable only insofar as they contribute to the value (in my amended terms, the well-being) of a life, but this value neither consists in nor depends importantly on any particular psychological states; and a Kantian rationalism such as developed by Korsgaard and Scanlon and perhaps Elizabeth Anderson, each in a different way, in which value is understood in terms of the reasons we have for adopting certain attitudes and relations to the valued object. As Scanlon puts it, “To value something is to take oneself to have reasons for holding certain positive attitudes toward it and for acting in certain ways in regard to it...To claim that something is valuable (or that it is ‘of value’) is to claim that others also have reason to value it, as you do” (Scanlon 95). While my position on the value of nature may seem to have obvious similarities to the rationalist position, I cannot develop and defend that view here against the other alternatives, in particular, against a Brink’s sort of objectivism. That task would involve sorting out deep and complicated issues that would take us too far astray. My primary argument here is with the subjectivist, on the one side, and the Moorean objectivist, on the other.

30. I am using the terms “economist” and “environmentalist” very loosely of course. I am interested in isolating positions assumed by some or perhaps many economists, on the one hand, and some or many environmentalists, on the other. Obviously, not all economists or environmentalists do or should accept the positions I associate with them.

31. This is meant as a characterization of conventional contemporary economics. This field becomes political economy of the more classical sort when questions of the distribution of the human well-being so produced are brought into the purview of the theory.

32. Of course, it is no easy matter to engineer artificial systems that provide the same services as natural ones. The limits of our understanding of how natural systems work and the limits on our technological prowess are both more than obvious at the present. But the point I am making is about the theory, not about our present practices.

33. Elizabeth Anderson makes a similar point. “Certainly, these [environmental] goods contribute enormously to human welfare. But people value environmental goods in ways other than use: we admire many wild animals, feel wonder and awe at spectacular storms and volcanic eruptions, demand consideration for delicate ecosystems, appreciate mountains and seascapes for their beauty...It makes sense for us to take up these attitudes toward wild animals, ecosystems, natural wonders, and so forth independent of our caring about any other particular things or people” (205).

34. My hesitation to endorse economic theory more strongly in this regard has to do with the degree to which it adheres to a subjectivist actual desire-satisfaction theory of intrinsic value.

35. This is, admittedly, a difficult argument to make. All I have done here is point to certain attitudes and feelings we typically have that seem to indicate the incompleteness of the economist's way of valuing nature. And the appeal to friendship as an analogy is limited. With the concept of friendship, we have shared intuitions about what a good friend is and the attitudes and behaviors that make one a good and proper friend. And these shared intuitions allow us to make the necessary critical judgments. Because the concept of the value of nature is more controversial, we cannot draw on a similar pool of shared intuitions.

36. The debate concerns what in nature has intrinsic value and hence moral standing. The sentientist holds that all sentient animals do, the biocentric individualist that all living things do, and the holist that holistic or collective entities such as species, ecosystems and perhaps the entire biosphere do. Some have tried to develop an inclusive holism that countenances the value of individuals as well as collective entities. Two good, recent discussions of many of these issues, one from a biocentric individualist stance and the other from an inclusive holist stance, are Varner, 1998 and Johnson, 1991.

37. An environmentalist might hold that the value of a part of nature had to be understood in terms of its symbiotic
relations to other things in nature, and thus the properties on which its value rested were relational and so extrinsic, not intrinsic. Such a view, however, would most likely see the larger entity or system of which the thing in question was a part as the real object of intrinsic value. The value of the part would be seen as contributory. This view has similarities to Moore's theory of organic unities, although as Korsgaard discusses that theory, Moore's motivation for developing it was very different from that of the environmentalist of concern here. See Moore, pp. 17-36 and various passages in Chapter VI, and Korsgaard, 1983, pp. 190-95.

38. This problem, of course, involves the same debates as those which swirl around the discussions of internalism and moral realism.

39. This claim is admittedly tentative. The issue is very complicated and more needs to be said than I can go into here. A few comments are in order, however. On my view that nature has life-enhancing impersonal, objective final value, the value of nature does make a contribution to the value of a life if the proper attitudes and relations to nature are assumed. Thus, we have reason to value nature as an end and thus to promote or preserve it. But talking of reason here merely raises one aspect of the internalism debate and does not quite get us over the motivational problem. Can one have a reason to value nature without realizing that one does and so without that reason being motivational? How to answer this question is the key problem for the Kantian trying to establish a position between the subjectivist, for whom motivation is not a problem, and the objectivist, for whom it is.

40. Of course, the economist can maintain that such distinctions are none of her business, and cite the principle of consumer sovereignty as evidence. This move raises questions about the normative dimensions of economic theory and the adequacy of the assumed value theory. Also, the problem outlined above by Korsgaard is one of the motivations to move from actual desire-satisfaction theory to counterfactual desire-satisfaction theory, to use Brink's terms. This move, however, has its own problems. For a discussion, see Brink, pp. 228-230.

41. For two critical discussions of cost-benefit analysis in the context of the issues with which I am concerned here, see Anderson, 1993, Chapter 9 and O'Neill, Chapters 4 and 5.

42. As Anderson puts it, cost-benefit analysis claims “that welfare is measured by an individual’s ‘compensating variation’”, where “the compensating variation of an individual for a project is defined as the maximum sum of money she will pay to bring about the project, if she wants it to take place, or the minimum sum of money she will accept to put up with the project, if she does not want it to take place” (Anderson 191).

43. Why not plant plastic trees in situations where natural trees might be difficult and costly to maintain, if the plastic trees, from the distance at which they would be viewed, were indistinguishable from the real ones? Why not indeed? This question gave rise to the famous article by Laurence H. Tribe, “Ways Not to Think About Plastic Trees: New Foundations for Environmental Law.”

44. Elizabeth Anderson and Mark Sagoff make similar points. See Anderson, pp. 209-10 and Sagoff, 1988, Chapter 2. For other criticisms of existence value in relation to willingness-to-pay methods, see Attfield.


46. Of course, for Kant, the only thing with a dignity, that is, with unconditional intrinsic value, was the good will or rational autonomy. Nature for Kant had only instrumental value and hence a price. But his point is independent of his theory of value.

47. Goulder and Kennedy, p. 25. Anderson provides a comparable definition: existence value is “the value people place on the existence of something, [and] is distinct from the use-value of a thing” (Anderson 230).

48. This is attempted by Jonathan Aldred in Aldred as described in Attfield.

49. There is a renewed discussion of issues of incommensurability of values that promises some progress on these very difficult questions. See in particular the collection of essays in Chang.
WORKS CITED


The inquiry, “Valuing Nature,” was first prompted by critique of an attempt to assess the natural world’s economic value. Later the inquiry was broadened so that “Valuing Nature” could be viewed from a variety of perspectives. My contribution, conjecturing from an artist’s perspective, has been intense because I consider valuing nature to be the understanding and founding moral sentiment which can refine reason, enlighten judgement, and reconstruct art, culture and political economy. As a consequence, I am concerned that belief in supernatural values, though once a positive influence for society, has now become lethal to society resulting in increased ethnic/social stress, nihilism, and finally real ecological degradation which threatens the survival of human being. Similarly, though less vehemently, I am opposed to idolatry of language—sometimes mockingly called “transcendental idealism in linguistic clothing.” I am even more opposed to outmoded transcendental idealisms that evoke supernatural entities as ultimate authority and I argue that these forms of idealism have become mystifying illusions that have destructive social consequences. Our culture has great need of new ideals and new art which contend with the pleasure and tragedy of understanding the fateful priority of nature—ideals which reflect the understanding that the human spirit including the desire to transcend nature, exists, develops and evolves within nature itself.

In relation to nature, history and the growth of knowledge have presented artists with different obligations. Leonardo Da Vinci was concerned with objective study of nature. For Matisse, nature was inspiration for subjective arabesque—although since then, on a social scale, there have been few moments of his cherished “lux, calme, et volupte.” Western culture has suffered two world wars, ecological disgrace, and “reason” has developed the ability to degrade the environment and destroy life. The intervening art, though manifestly hypersubjective (and often vain), has been a latent index of social stress. Now the threat to human existence is the basis for renewed sublimation of subjectivity and celebration of the value of objective observation. Now the obligation is
to discipline sentiment and vanity by means of an objective relationship with natural process. On that basis, we can appropriately reconstruct objectivity by understanding that the consummation of inner experience is contingent upon measured relationship with the world of nature.

This is my premise: human society has reached a point where the obstacle hindering its existence, environmental degradation, is fact. Valuing protection of the environment is crucial for the preservation of being. If the environmental crisis is a fact or is soon to be a fact, then it is sensible to change our values and behavior accordingly—healthy environment ought to be a birthright of all people. Furthermore, the maintenance of a life-sustaining natural environment has become an objective foundation for the establishment of quality of life and moral value. We now live, therefore, under the obligation to value nature over all, or at least prior to, other values particularly for survival, but also to insure that trade-off of nature for other values i.e. resources for jobs, is not self-defeating. Moreover, valuing nature encourages reverence for life and recognition that nature is the ruling power over life; as such it reconstructs religion and binds (re-ligare—Latin meaning to bind back) all people by means of an organizing principle for sentiment, conduct and practical life.

The position I argue for holds that at the base of the environmental crisis and cultural decadence is arrogant misuse of human reason. While technology is generally beneficial, misuse of technology is a symptom of a deeper problem of faulty epistemology—of how we fail to recognize our causal dependency on nature. That failure is in large part due to a negative self-destructive dynamic inherited from hubris, rampant platonism and our presumptuous pre-scientific religious illusions. Positively, if we can come to a clear understanding of the priority of nature, that is, the causal dependency of human being on the process of nature, then we will use reason appropriately and thus experience greater freedom and a better world. I am going to call this position valuing nature. I argue that art which expresses this value helps individuals develop the appropriate emotional response to being in nature and contributes to the construction of a culture, which understands natural and social purpose—thus a society which will flourish and experience greater well-being.

Valuing nature is an aesthetically and scientifically informed awareness and moral sentiment enlightened by recognition that nature is prior to human reason and thus the foundation for judgement and freedom. Valuing nature recognizes that human survival, and quality of life are causally dependant on natural process and evolution. Valuing nature acknowledges that there is no supernatural cause or solution to the problems of human being. Valuing nature recognizes that human reason has limitation and cannot, in the strict sense of the word, comprehend nature. Valuing nature recognizes the responsibility of reason and art is to evolve and mirror the morphology and evolution of nature. Valuing nature is enthusiasm for life, celebrating earthly happiness, and is thus anti-nihilist and anti-postmodernist.
CONSEQUENCES

Valuing nature as a critique of supernatural truth claims obliges art to reconstruct a socially-binding metanarrative and construct a new humanity. Valuing nature establishes the importance of aspiring to accurate perception and representation of nature. One consequence is the naturalization and discipline of philosophy—shifting preoccupation from definition and language, to nature and the world. Valuing nature can become an organizing principle to influence passion, conduct and practical life; it can be a foil for hyperindividualism and its aspiration to subjective authenticity (unconcealness). Valuing nature, as an overarching awareness and obligation, potentially can focus culture and ameliorate conflicts caused by ethnocentrism. Valuing nature can help establish a birthright to a fair share of the natural resources. Finally, valuing nature may result in more effective government as citizens realize it is in their mutual self-interest to mutually coerce behavior to protect their environment (Simon, Hardin, Hobbes).

MY WORK

I began working fifty years after Matisse wrote Notes of a Painter in 1908. As is the case with most artists, my first work was conceptual, conventional and not about seeing. The work was about formula and not about nature. The succeeding art, however, drawn from direct perception of anatomical specimens, particularly a dead monkey head, was alive and exciting. That experience led to my respect for fresh perception and consequent disrespect for conceptual thought, which occluded vision. I learned that creative work in science and art, in addition to aesthetic organization, is based on the sensation, metaphor, and elucidation of nature. At the same time, circa 1960, I was excited by Nietzsche’s Birth of Tragedy, and thus The Bacchae of Euripides. Soon after, I illustrated The Defense of Gracchus Babeuf with portraits of philosophers of the French Revolution. I was also interested in critical theory, the post-war critique of idealism, the authoritarian personality, instrumental reason, and technology—much of which, according to the Frankfurt school, stemmed from the underestimation of affect and nature, leading to arrogant appropriation of “instrumental” reason. So I am predisposed to value nature. I am in solidarity with the aspiration to naturalize and discipline reason—to save reason from hubris. The caveat is that we must increase reliance on the instrument of reason to help measure and see nature accurately, for it is the highest romantic folly to identify ego with the omnipotence of nature and deny the discipline of perception that reason provides.

ARTISTS USE REASON TO SEE NATURE

Artists can become adept at “objectifying” or structuring the experience of nature. We learn to use cognitive skills to measure and refine perception. We solicit and negotiate antimonies such as figure/ground, perception/conception, and nuances of color such as warm/cool, neutrality/intensity etc. Artists who work perceptually work in a medium that is a more immediate index of sensual/empirical experi-
ence of nature than verbal language. On another level, artists can develop a critical attitude towards conceptual formula. We learn how images can sublate preconceptions and prejudices and how to intelligently construct and present freshly critical images—generally how to value mindful awareness.

The fundamental discipline is to see and represent nature as clearly as possible—to be enthralled with selfless perception of nature. Iris Murdoch, the late English philosopher, celebrates accurate representation in *The Sovereignty of the Good*:

“...Virtue is *au fond* the same in the artist as in the good man in that it is a selfless attention to nature: something that is easy to name but hard to achieve” (p. 41).

“...The representational arts, which more evidently hold the mirror up to nature, seem to be concerned with morality in a way which is not simply an effect of our intuition of the artist’s discipline. These arts, especially literature and painting, show us the peculiar sense in which the concept of virtue is tied on to the human condition. They show us the absolute pointlessness of virtue while exhibiting its supreme importance; the enjoyment of art is a training in the love of virtue... Good art reveals what we are usually too selfish and too timid to recognize, the minute and absolutely random detail of the world, and reveals it together with a sense of unity and form. This form often seems to us mysterious because it resists the easy patterns of the fantasy, whereas there is nothing mysterious about the forms of bad art since they are the recognizable and familiar rat-runs of selfish day-dream. Good art shows us how difficult it is to be objective by showing us how differently the world looks to an objective vision” (p. 86).

I admire Murdoch’s case for aspiring to objectivity, or unselfing, as she might put it. The point is to lose self-image consciousness and be in love with the world. Style is the byproduct of the struggle to be clear and objective. I might agree with Murdoch about her notion of the aimlessness of the universe, but on earth, in our human environment, I can see great social benefit in recognizing natural purpose, and the concept “purposiveness of nature.”

**PURPOSIVENESS OF NATURE**

In the spirit of this critique it is important to state that valuing nature is not valuing the word “nature.” I am not primarily interested in the abstract concept *nature*, but the dynamic organic process represented by the word. Ironically, for my purpose in this context, it is important to define nature. *Nature* from a common sense perspective, is the universe, including our world and thus including material objects and processes in space/time which we can perceive with our senses. We also have access to a more sophisticated concept of nature that includes scientific and philosophical insights which promote a concept of nature as a dynamic, self-organized system whose laws can be discovered with the instrument of reason. Great difficulty can arise in the analysis of how human reason and natural purpose are connected. There is a presumptuous tendency to arrogate to human reason an inflated claim that it
comprehends natural law or is supernatural transcendence i.e. Reason. It is, however, particularly important not to conflate natural law, and human reason (or make human reason God)—particularly as human usage of reason is so often flawed. Therefore, Kant’s concept, “purposiveness of nature,” is more accurate when talking about natural process and natural law. In the Critique of Judgement, prior to his discussion of beauty and the sublime, Kant takes great pains to analyse and define purpose and the purpose of nature as the foundation for judgement. Gratefully, from my perspective, Kant discovered a means of elucidating natural law and function without acknowledging a designer or architect of nature. Kant’s concept of the purposiveness of nature is a means to construe nature to human understanding without acceding to a supernatural deity. It is a handsome concept, attractive in its recognition of the logic and process of nature, which in turn is the foundation for judgement and freedom.

NATURE AND PHILOSOPHY—THE RETURN OF REPRESENTATION

It was, until recently, fashionable in professional philosophy to reject naturalistic ethics, focus on language, and accede to a strict dichotomy between fact and value, or nature and morality. Many philosophers are still interested in linguistic therapy, which for the construction of social purpose I find to be myopic or simply inappropriate. Thus I must reject the “naturalistic fallacy” (G.E. Moore) as being semantic pedantry (perhaps the abstractionist fallacy or pernicious mentalism); rather I am in solidarity with naturalistic ethics, i.e. Aristotle. While I recognize that we cannot know nature in itself, my intuition is that direct perception of nature and conjecture about nature are organic to the creation of meaningful sentiment and meaningful art. The purpose of art must again be to mirror (that is see and accurately represent) nature and also to participate constructively in the conversation about value. This position, of course, contradicts the views of modish philosophers such as Rorty. Consider the argument he makes via Sellars and Quine: “The crucial premise of this argument is that we understand knowledge when we understand the social justification of belief, and thus have no need to view it as accuracy of representation.” I argue that belief in belief soon becomes inbred and reactionary—the growth of knowledge needs fresh conjecture, metaphor, and paradigms constructed by means of fresh attempt to accurately perceive and represent nature.

STRAWSON’S CHALLENGE AND DEFINITION OF HARD NATURALISM

For the purpose of valuing, defining and representing nature, consider Strawson’s conjecture: “Let us consider the idea that whatever exists at all exists in nature, in the world of objects, occurrences, processes in space time; so that to talk of abstract objects, intentions, universals, meanings, etc. must either be to talk in an oblique way about things and happenings in nature and nothing over and above nature, or be simply myth-making, indulging in fiction. (p. 79)” Though only a conjecture, it is a nice balancing corrective to those happy Platonists who over-estimate the value of abstract universals—and language.
POUSSIN’S CHALLENGE

In the Fogg Art Museum, there is a painting, *The Birth of Dionysos and the Death of Narcissus*. I see it is a philosophical text wherein Poussin is instructing us on the necessity and benefit of recognizing the priority of nature. The birth of a healthy natural affect, an enlightened second nature, depends on the appropriate development of passion beyond narcissistic self-interest—i.e. awareness of the pleasure and tragedy of understanding natural fate. Natural passion and passion for nature enlightened by reason, constitute Dionysian religious wisdom extending from Greek culture to Titian to Poussin to Nietzsche etc. This insight can reemerge as deeply significant for our culture.

NATURE IS SOVEREIGN—THE MISSION OF ART

In the year 2000, artists still have the obligation to make beautiful and provocative form which embodies significant content. Now, with appropriate humility, it continues to be important for artists to help reconcile antimonies such as: subject and object, reason and passion, fact and value, value and culture—and ethical concerns such as degradation of the environment and poverty. To become a reasonably authentic sovereign individual requires a powerfully affirmative integrity; however, the primary responsibility of all citizens is common welfare, which teaches, through recognition of resource limitation for example, that nature is sovereign. In our time, protection of the environment and the awareness of the potential environmental crisis are intimately related to common concerns of survival, freedom, and political economy. Those concerns and the social contract force us to use judgement to measure and decipher “the objective purposiveness of nature.” The mission of art no longer can be childlike self-expression or appeasement of clients, but education and forceful social criticism—not the decoration of denial, but creation of speculative images of the good. Artists need to recognize the “extraordinary privilege responsibility confers” (Nietzsche) and stop exalting vain “child-like” behavior—stop whining about authenticity and become cultural doctors. With great enthusiasm artists need to “...contribute to the instruction of mankind (Hume).”

ART, NATURE AND RELIGION

In the distant past, artists did not “value nature” per se; art helped mediate cultural/religious experience. In the recent past, art has been more of a means to express personal experience—or a gesture critical of authority. For our time the challenge for art is to lead society to recognize the fundamental value of nature—that nature, as the source of being is ineluctable, inescapable reality. It has become clear, by means of human reason, that there is no supernatural solution to the problems of being—there is no magical answer to the management of material conditions that aggravate the suffering of being. Though religious speculation is socially beneficial and comforting, society can no longer tolerate blind faith or palliative illusions which seem harmless, but which may collude in the degradation of being in the environment. Therefore, it has become the responsibility of art to see and elucidate nature, and critique religion for the purpose of social well being. A serious critique of the arrogance of
religion in relation to nature was made by Lynn White in “The Historical Roots of Our Ecologic Crisis:”

Especially in its Western form, Christianity is the most anthropocentric religion the world has seen...Christianity, in absolute contrast to ancient paganism and Asia’s religions...not only established a dualism of man and nature but also insisted that it is God's will that man exploit nature for his proper ends...Both our present science and our present technology are so tinctured with orthodox Christian arrogance toward nature that no solution for our ecologic crisis can be expected from them alone. Since the roots of our trouble are so largely religious, the remedy must also be essentially religious, whether we call it that or not. We must rethink and refeel our nature and destiny.

I agree with Lynn White that the solution must be religious in the broadest sense. I am not calling for the eradication of religion, but of values inherent in the institutionalized, monotheistic, revealed religions.

“The Miracles of Nature”

Sustaining the miracle of human existence is a fundamental value worthy of religious celebration. To instruct judgement and inspire religious feeling for nature, the responsibility of art and reason is to show not only the nature of logic and the logic of nature, but art also can show i.e. represent what Wittgenstein called, “The miracles of nature.”

The miracles of nature.

One might say: art shows us the miracles of nature. It is based on the concept of the miracles of nature. (The blossom, just opening out. What is marvelous about it?) We say: “Just look at it opening out!”...(p.56e)

The mathematician too can wonder at the miracles (the crystal) of nature of course; but can he do so once a problem has arisen about what it actually is he is contemplating? Is it really possible as long as the object that he finds astonishing and gazes at with awe is shrouded in a philosophical fog?

I could imagine somebody might admire not only real trees, but also the shadows or reflections that they cast, taking them too for trees. But once he has told himself that these are not really trees after all and has come to be puzzled at what they are, or at how they are related to trees, his admiration will have suffered a rupture that will need healing. (p.57e) (Ludwig Wittgenstein, Culture and Value, 1947)

This quotation may express a religious feeling for nature. It is a fine representation of the interpenetration of mind and nature—which is the foundation for art and language, culture and value. It “shows” the dilemma of representation, and the difficulty of seeing how language (concept) hooks on to the world. It demonstrates the problematic relationship between concept and art, concept and nature;
that is, that art, language, and conceptual paradigms are beneficially reinterpreted or abandoned if they are fallacious. When critiquing the value of conceptual thought and celebrating the value of natural purpose, however, it should be clearly recognized that appropriate use of reason is positive in relation to nature—although clearly, to value nature is to devalue reason as God. The point is that natural process is the ground of being and is thus the fundamental criterion for reason’s just employment. Good art “shows” the value of nature, enhances religious feeling and refines the usage of reason.

“The Miracles of Nature” in America

Over a century before Wittgenstein, in 1837, Emerson wrote the following: “The first in time and the first in importance of the influences upon the mind is that of nature.” On Aug. 23, 1851, in his journals, Thoreau evoked an associated value in a perception of the natural world:

I saw a snake by the roadside and touched him with my foot to see if he were alive. He had a toad in his jaws, which he was preparing to swallow with his jaws distended to three times his width, but he relinquished his prey in haste and fled; and I thought, as the toad jumped leisurely away with his slime-covered hind-quarters glistening in the sun, as if I, his deliverer, wished to interrupt his meditations—without a shriek or fainting—I thought what a healthy indifference he manifested. Is not this the broad earth still? he said.

For me this perception expresses a fresh feeling for the miracle of nature and acceptance of natural fate, which signifies a stoic or tragic, religious sentiment without orthodox, moral value judgement.

The Gambit of Hubris, Divine Reason and Magic

The premise of valuing nature proposes that grounding value in nature lessens the mystification, and hubris, associated with the truth claim of “divine reason”—the abuse of power resulting from individual or tribal gambit to achieve status as superior or omnipotent “chosen” people. It proposes and reiterates the necessity of seeing that reason accede to the reality of human dependence on nature. It proposes that valuing nature (and passion) reinvigorates art—that hubris, solipsism, and personal fantasy are the enemy of art and social progress. While structures and consolatory dreams constructed by means of hubristic reason or magical thought may excite and provide provisional security, they also provide comfortable disincentive to see the complexity, morphology, and threat to real human existence that characterizes being in nature. Certainly, if there is crisis in our relation to the natural environment, we must give up magical thought no matter how consolatory, in order to see nature as clearly as possible and develop enlightened social policy. [I acknowledge that there are religions that worship nature and attribute to it magical powers, and that this results in respect and reverence not hubris and abuse. My concern is with magic as primitive prescientific logic based on fallacious associations and superstition.]
NATURE AND REASON

Nature, like Thoreau's snake, is neither good nor bad. Nature is amoral. We construct what is good by using passion and reason. We employ reason to perceive discord, minimize suffering, create harmony, and maintain a hospitable, aesthetic environment. Notwithstanding the progress of science, we see that reason, used as an instrument of hubris, technology and war can have deadly consequences. Reason is like a magnificent, beautiful snake whose mishandling can have lethal consequence. Perhaps that was foreseen by Epicurus in his critique of Plato and his solidarity with Aristotle when he, by means of reason, proposed the dethronement of reason and the establishment of nature as the fundamental value. [From Epicurus to Hume, there has been recognition of the value of human sentiment or natural virtues derived from: feelings, sensations, sympathies that provide love and a sense of inner justice etc.] Certainly Epicurus's celebration of life and denial of immortality delighted Nietzsche.

REASON

We celebrate reason as our most useful instrument in providing freedom and profitably negotiating being in nature. However the usage of reason is compromised by its limitations. Compared to the infinite complexity of nature, reason is limited. Therefore it is crucial to realize that to achieve freedom, reason must be criticized and tested according to its benefit in accommodating nature. It is socially lethal to believe in reason when nature is not accommodating.

ENLIGHTENED REASON

Society needs every bit of enlightened reason it can get. Though reason is morally neutral, it is the mind’s finest analytical instrument. Reason has provided us with invaluable ability to transcend childish behavior and establish language, the rule of law, mathematics, social order, science etc; but reason without justice can be lethal. Pure reason may be an infallible instrument, but practical reason has been used as an instrument of denial—an instrument of theistic orthodoxy, a gambit of hubris and the instrument of reactionary idealism. Reason, unfortunately, has also been used as an instrument of evil oppression—Nazism, Fascism and the destructive alliance of technology and religion (the later in that they mutually reinforce claim to superiority to nature). The words of a contemporary French philosopher express those concerns and contradictions, “One is still defending reason when one fights those who mask their abuses of power under the appearances of reason or who use the weapons of reason to consolidate or justify an arbitrary empire.” (Pierre Bourdieu, p. 20). It is the responsibility of philosophy and art to temper reason in the flames of justice and virtue—and ecology. So it is imperative to describe ways in which the fallacious over-inflation of reason and seemingly reasonable conceptual thought, such as “idealism,” or even the seemingly neutral concept of “form,” have tragic consequences from a broad ecological perspective.
THE PLATONIC FALLACY

Consider the celebrated Platonic concept “ideal form” from a post-Galilean ecological perspective. Form as a way of simplifying and organizing experience has been a particularly beneficial concept. It is not, however, beneficial to arrogate to form more significance than it deserves. The very act of conceiving of an ideal form, a cup for example, abstracts that form from the environment. In nature, all objects (forms) are embedded in the environment. The question, “Where is the ideal environment for the ideal form?” betrays the fallacy of platonic idealism. This “Platonic Fallacy” (the overvaluation of form) has the consequence of devaluing the environment. In fact, since the Renaissance, artists have recognized that it is the relationship of form to environment, or figure to ground, which accurately represents the dynamic process of nature. To push the critique further, from a scientific perspective, there is no “form” in nature—only energy in transfiguration. For our time the challenge is to reconcile the difference between the “object” of Newtonian physics and the perceptual “uncertainty,” (the dance), of quantum mechanics (energy). It is the necessity of art to construct form while also elucidating its limitations. (Students of perceptual drawing commit an associated fallacy: the semeiotic fallacy—they interpose preconceived signs which disenfranchises them from their own perception—perception of what is actually in front of them. They do not see, or will themselves not to see, what is really there.)

Limiting reason thus, and valuing nature, implies the devaluation of idealism (supernatural values). By valuing nature we disenthrall ourselves from that deification of human “reason” which is ironically irrational, naive, and arrogant when in the service of the denial of natural fate. To value nature is to devalue super-earthly hopes and pseudo-rational pretensions to transcendence, which have become lethal to social well-being.

VALUE PER SE

Analysis of the value of nature depends on society’s judgement of nature’s potential benefit to the amelioration of misery and also the enhancement of justice. Also, our inquiry requires us to more broadly evaluate the relative merit of valuing nature (potentially to the detriment of other values). It encourages consideration of the question, “what is the value of valuing nature?” The primary intent of an inquiry concerning value qua value is to discern benefit for human being. A value is positive if it enhances pleasure and/or minimizes suffering for humanity. There are four ways to define value in relation to nature:

I. Ontological value is recognition of the biological basis of life, which insures survival (coercing liberty). For humans nature is inherently good.

II. Moral/utilitarian value is recognition of our moral responsibility to limit suffering which results from environmental degradation, (which our ecologists and economists have well described).
III. Moral/aesthetic value is recognition of the pleasure of being in nature and joy in the establishment of harmony in nature. George Santayana in *The Sense of Beauty* used the Greek term *Kalokagathia*, defined as the aesthetic demand for the morally good, which he considered “...perhaps the finest flower of human nature.” Values can be objectified by consensus but values are based on subjective feelings, i.e. a sense of beauty. From this perspective, to paraphrase Spinoza, we value something not because it is good, but it is good because we value it.

IV. Moral/social value is recognition of nature as the ground of mutual human sentiment. On June 30, 1852, in his journals, Thoreau beautifully expresses this value.

Nature must be viewed humanly to be viewed at all; that is, her scenes must be associated with humane affections, such as are associated with one’s place, for instance. She is most significant to a lover. A lover of Nature is preeminently a lover of man. If I have no friend, what is Nature to me? She ceases to be morally significant.

THE ONTOLOGICAL IMPERATIVE

The *ontological value* of nature is so obvious, so absolute, and so imperative as to deserve the fundamental place in our hierarchy of values. Consequently, I define the imperative and universal law of human being, as the *ontological imperative*, which is to act according to the recognition that human dependency on nature requires that action’s first responsibility is to protect being in the environment. This requires reason to stand under nature—to understand nature and function as a means to negotiate that dependency for the purpose of survival and social well-being. Thus, contemplating and accepting the *ontological imperative* forces us to a reciprocal critique of the value of reason. We elevate or degrade the value of nature by means of rational analysis. While it is passion (for nature) that is the appropriate foundation for reason, it is reason that enlightens our passion. Reason recognizes the value of economic and ecological goods and services. It is reason that forces us to see our fate, negotiate our relationship to nature and when appropriate, accept mutual coercion of liberty.

The *ontological imperative* underlines the recognition that reason is not an end in itself—it is not “god” superior to nature; rather it is the means to elucidate the purpose of nature and maintain the unique material manifestation of energy in space and time which is hospitable to human being. Being does not serve reason: rather, reason serves being. Simply stated: reason is the means of being in harmony with nature and to teach us the tragic reality of fate and the tragic consequences of not mutually coercing our behavior in recognition of necessity.
Seeing nature accurately and valuing nature recognizes that being in nature has a tragic dimension. Nature throughout the cosmos is generally incompatible with life. On earth where human being has established a foothold, nature threatens well-being and is the source of suffering through: climatic hostility, disease, predation, pollution, pain and the inevitability of death. Throughout space and time, nature is perceived to be “magnificently indifferent,” and without remorse. Therefore, one might reasonably feel that nature is hostile. It might seem reasonable to perceive nature as evil and the enemy of life (to say nothing of happiness). That anthropomorphism, however, is a type of pathetic fallacy. On balance, it is self-evident that nature has unlimited positive value because the survival of humanity depends on the maintenance of a hospitable natural environment. We are physically dependent on nature and with the exception of magical thought or supernatural illusion, the reality of that dependency overrides, and sublates subsequent values—assuming that life itself is the fundamental value. In our time, not valuing and accepting the priority of nature seems as self destructive as a parasite’s attempt to kill its own host.

In relation to the economic sector of our inquiry, valuing nature has ironic and contradictory consequences for policy. On the one hand, it seems to encourage a Darwinist free market; on the other hand, valuing nature may help establish the right of all individuals to enhanced justice by means of recognizing a birthright to a reasonable share of the limited natural resources, as well as responsibilities to participate in their management. In this light everyone’s birthright requires a healthy environment and enlightened control of capital. Though protecting survival in the material environment is the first priority, as part of nature, the amelioration of human suffering is a subsequent responsibility. Therefore it is a responsibility of reason to minimize misery and not collaborate with ideas such as economical/mathematical models, which do not sufficiently recognize social consequences i.e. entrenched poverty and ghetto environment.

Now, with ecological insight, it is time to give up the illusion of supernatural intervention—and to recognize that the necessary condition for the construction of social wellbeing is the achievement of harmony with nature. In other words, our goal of social and economic democracy must grow from ecological rationality—the acceptance that human being is incontrovertibly dependent on nature. Utopian, aesthetic and moral speculation must be grounded in material recognition of that priority of nature for human thought. To define this celebration of the priority of nature more precisely, I like to use a definition of “materialism” by the Italian philosopher Sebastiano Timpanaro in 1973:

By materialism we understand above all acknowledgement of the priority of nature over ‘mind’, or if you like, of the physical level over the biological level, and of the biological level over the socio-
economic and cultural level; both in the sense of chronological priority (the very long time which supervened before life appeared on earth, and between the origin of life and the origin of man), and in the sense of the conditioning which nature still exercises on man and will continue to exercise at least for the foreseeable future (p. 34).

We see that how we define nature has implications for the concept of human being and human values. If we perceive nature as substance and form which we can master and engineer to our benefit, we may have an inappropriate feeling of superiority (“the gaze of development”). If we view nature as an index of god’s mind and we view ourselves as designed in god’s image, we augment our hubris. However, as an alternative perspective, if we see nature as the fundamental process organic to being, then we appropriately view ourselves in a dependent relationship that must be sensitively monitored and we see human being as part of nature rather than superior to nature. So either we, with God’s support, are superior to nature and can use nature as a means or we are both part of and inferior to nature and must manage our dependency with the purpose of living in harmony with nature.

DEUS SIVE NATURA

When we look at nature eye to eye, scientifically and courageously, we see consequences appropriately tragic for ego and the concept of god. The consequence of valuing nature is to give up the concept of “divine reason,” and thus to devalue God or at least recontextualize the concept of god. Spinoza’s loaded question, “Deus sive Natura,” (God or Nature) is answered by valuing nature—by choosing nature, or Nature as God, one does not value a god superior to nature. The concept of a supernatural god, super-earthly hopes, and all magical thought may have had beneficial moral value and has been of considerable value as a comforting illusion. But as Arthur Koestler wrote in 1967, “God seems to have left the receiver off the hook and time is running out.”

TRINITY

The history of theology has been constructive and concepts such as “god as the mind of nature” or “the intelligence of nature,” may be positive, but on balance the concept of God as omnipotence superior to nature has become socially lethal. It is socially lethal because of the unholy alliance between theology and technology—and some would add capitalism to the evil concoction. (The quintessential emblem of that “unholy” alliance is naming of the first Atom bomb “Trinity.”) Another lethal outcome of the god of omnipotence are ethnic claims of special relationship to God—and destructive aggressive behavior based on the illusion of access to omnipotence.

THE DEATH OF GOD

There is a long tradition of this critique of and the concept of God. Feuerbach proposed that we sublate theology by means of anthropology. Nietzsche, famously and/or
infamously, proclaimed the death of God and as a corollary he proposed the transvaluation of all values—a systematic elevation of earthly values and earthly spirituality and devaluing superearthly hopes. Valuing the value of nature provides us with a criterion for the discipline of reason and religion; it provides a foundation for the negotiation of the transvaluation of all values.

This critique of religion and the supernatural is not arrogant posturing; rather, it is confrontation of the transitional stage prior to the triumphant return of affirmation and passion for the world—to re-legate society on a solid footing of natural virtue. The rejection of immortality and the supernatural presages achievement of life in the real world, and a resurgence of courage and freedom. It is in that tradition and in celebration of “transvaluation” that Richard Rorty in the recently published book, Achieving Our Country, expresses solidarity with the critique of Whitman and Dewey:

They wanted to put hope for a casteless and classless America in the place traditionally occupied by knowledge of the will of God. They wanted that utopian America to replace God as the unconditional object of desire. They wanted the struggle for social justice to be the country’s animating principle, the nation’s soul. ‘Democracy,’ Dewey said, ‘is neither a form of government nor a social expediency, but a metaphysic of the relation of man and his experience in nature.’ For both Whitman and Dewey, the terms ‘America’ and ‘democracy’ are shorthand for a new conception of what it is to be human—a conception which has no room for obedience to a nonhuman authority... (p.137).

Valuing Nature Completes the French Revolution

Prior to any sense of environmental crisis, Western culture demonstrated a grand tradition of valuing nature: agrarian earth religions, paganism, Aristotle, Epicurus, Lucretius, stoicism, Leonardo, Copernicus, Telesio, Bruno, Newton, Bacon, Darwin, etc. Individuals have always celebrated the value of nature in art, poetry and philosophy. The cultural celebration of the value of nature, and the deflation of supernatural values, escalated about the time of the philosophical episteme preceding the French revolution (i.e. Rousseau etc.). The more significant social and political recognition of the value of nature emerged during of the French Revolution, at which time the repudiation of “divine right” inaugurated recognition that just authority derivest from reconciliation of social purpose and natural purpose. Since the French Revolution, there continues to be a struggle to establish a natural rather than “divine” moral authority. Western culture is recovering from barbaric world wars and continues to be characterized by authoritarian repression, religious wars, ethnic hatred, intense social struggle, unsettling paradigm shifts (i.e. relativity), and cultural war in general. If that were not enough stress, we have learned that human existence is threatened by ecological degradation and nuclear warfare. The year 1945 is a useful marker for the imperative to finish the revolutionary work of changing our values; Oppenheimer’s quote “I am become death” was prescient—we can no longer value or afford the illusion of “divine” or supernatural solution to the problems of being.
INNER NATURE

In response to the crisis of value and authority, art defensively turned inward contemplating “inner nature.” Art and theory became less concerned with universal moral purpose and more concerned with individual liberty. Art appropriately became a critique subversive of the tradition and language which led culture to value fascism and oppressive authority. Progressive art valued the critique of language (dadaism), reason per se (formalism), or emotion per se (expressionism), with little concern for fundamental extension of morality. That retreat to solipsism had an attractive child-like integrity, but the art produced was often experienced by the wider community as irrelevant or irritating gestures of frustration.

NATURE AND THE SUBLIME

Paralleling art, it can be argued that philosophy, in its excessive concern with language and grammar, withdrew from seeing and representing the world. Moreover, particularly in relation to valuing nature, modish claims by art critics supporting abstraction or deconstruction, of transcending nature and achieving the “sublime,” might benefit by evaluation in relation to Kant’s critique written over 200 years ago in The Critique of Judgement (1790):

But in what we are accustomed to call sublime there is nothing at all that leads to particular objective principles and forms of nature corresponding to them; so far from it that for the most part nature excites the Ideas of the sublime in its chaos or in its wildest and most irregular disorder and desolation, provided size and might are perceived. Hence, we see that the concept of the Sublime is not nearly so important or rich in consequences as the concept of the Beautiful; and that in general it displays nothing purposive in nature itself, but only in that possible use of our intuitions of it by which there is produced in us a feeling of a purposiveness quite independent of nature. We must seek a ground external to ourselves for the Beautiful of nature; but seek it for the Sublime merely in ourselves and in our attitude of thought which introduces a sublimity into the representation of nature. This is a very needful preliminary remark, which quite separates the Ideas of the sublime from that of a purposiveness of nature, and makes the theory of the sublime a mere appendix to the aesthetic judging of the purposiveness; because by means of it no particular form is represented in nature, but there is only developed a purposive use which the Imagination makes of its representation (p. 104).

Now, in the year 2002, there is support in criticism for the primacy of personal interpretation. When, however, there is no effort to be objective, the personal claim of sublimity is hollow, even mendacious.

MATISSE AND NATURE

A lucid and elegant case for the importance of subjective interpretation in painting was made by Matisse in Notes of a Painter. To distinguish his work from the Impressionists and their “...deceptively fleeting impressions,” he indicated that he was after
“...expression...a more lasting interpretation... I want to reach that state of condensation of sensation.” The following famous quotation was a breath of fresh air for twentieth century artists:

> What I dream of is an art of balance, of purity and serenity devoid of troubling or depressing subject matter, an art which might be for every mental worker, be he businessman or writer, like an appeasing influence, like a mental soother, something like a good armchair in which to rest from physical fatigue.

Subjective expression per se, has now become less interesting often devolving to solipsism and “art for art’s sake,” though the abstract elegance of Matisse’s paintings and his analysis of the grammar of visual expression continue to be influential for pictorial thought. Now from our critical perspective, however, contemporary focus ought to be less about decoration or appeasement and more about the world. To be fair, this is not a critique of Matisse; he understood cultural influence “...we belong to our time and we share in its opinions, preferences and delusions,” and he definitely recognized the priority of nature, as evident in the quotation, “...Those who work in an affected style, deliberately turning their back on nature, are in error...”

**ETHOS OF ECOLOGICAL JUSTICE**

Now, at the beginning of an era when most scientists acknowledge an environmental crisis, society needs artists to be in solidarity with the obligation to see and picture nature accurately, to imagine a better future and to construct images of social well-being or images which provoke more social well-being—images which *show the miracles of nature* and encourage contemplation of the good. Certainly artists will and should continue to celebrate authentic individualism, but preferably they can transform that intuition in the service of becoming architects participating in the creation of a new ethos of ecological and social justice. It is time for artists to accept the social obligation to construct a vision of the common good wherein human relations inspire individuals and culture to limit liberty, or even coerce liberty if necessary, in exchange for freedom and justice. Of course, art will not do any good for society if it does not celebrate life, have beautiful form, or ask meaningful questions.

**THE VALUE OF VALUING NATURE**

The goal of moral purpose and aesthetic purpose is to minimize pain and suffering, and augment pleasure and happiness—to maximize justice. The primary reason for valuing nature is to protect being, but the ultimate value of valuing nature is that it binds human beings socially—it provides the foundation for a fresh cultural/religious content—an incontrovertible content that must be shared by all human beings.
A BETTER WORLD ORDER

Art can help us see. If we can perceive the value of nature, the economic cost and lethal consequences of environmental degradation, we may actually have an incentive and opportunity to create a new culture sensitive to life and environmental priority. Unfortunately, there are still reactionary forces. We are fighting a cultural war wherein those forces, in denying the ecological imperative, employ deadly orthodox religious ideology to avoid reality, impose value, justify authority, and consolidate power. Those with other values, who can see the profoundly beneficial consequences of valuing nature, those who can imagine and will work with courage to construct the future, must present an alternate vision of the good grounded in the struggle to create a reasonable harmony on earth—an economics of happiness—reasonable happiness for all peoples of the earth.
Appendix: Logic of Valuing Nature

with Nicolas Cornell

Intended Goal/Conclusion: Nature is of fundamental and paramount importance.

Premises:
P1 Survival is of paramount importance.
P2 If we destroy the environment (nature), we cannot achieve survival.

Difficulty #1: The premises do not logically imply the conclusion.

Solution: Add another premise (implicitly)

P3 If something is of the highest importance then the necessary conditions of it are also of the highest importance.

Difficulty #2: Survival is not of paramount importance in that bare existence is meaningless without quality. (i.e. Life without quality is not worth living)

Solution: Rephrase the first two premises specifying “quality of survival”

P1 Quality survival is of paramount importance.
P2 If we destroy the environment (nature), we cannot achieve quality survival.

Solution: Support the second premise with a new premise as an aspect of the original.

P2a There is no supernatural escape should we destroy the environment (nature).

This premise may not seem to be a reasonable assumption but it can be reasonably supported with two lines of argument.

1. Nobody makes policy based on the idea that there is a supernatural escape (e.g. nobody jumps of a bridge assuming God will save them before they hit the water). Thus, though it may exist, it is sound policy to assume that no supernatural escape exists.

2. Religion must be divorced from materialistic questions. Regardless of our view of religion in the realm of morality, we cannot see it as important in the material realm (e.g. God may give us intangible moral solutions, but He or it doesn’t actually produce more material trees).
At this point the objector is left arguing that either

1. we will achieve a supernatural and non-material survival, or

2. we can count on religion to produce material benefits. Since both of these positions seem only vaguely tenable, the argument will be left at this point.

Difficulty #4: The second premise is false if technology and new human constructions will allow us to survive even in the face of a destruction of nature. In other words, the argument fails if nature proves not to be a necessary condition of human survival (e.g., protecting the ozone layer is not important if we can create a substitute or replenishing technique).

Solution: Support the second premise with a new premise as an aspect of the original.

P2b Technology and human constructs cannot assuredly provide an escape from our dependency on nature.

There are three independent reason that this premise ought to be accepted:

1. Technology and artificial constructions are themselves dependent on nature.

2. To reject this, is to create faith in reason or essentially deify reason. This then results in the pitfalls of a supernatural objection outlined above.

3. Even if it is possible that such an escape exists, it is not assured. Thus, we cannot gamble something of paramount importance (survival) on the assumption of its existence.

Final Argument:

P1 Quality survival is of paramount importance.

P2 If we destroy the environment (nature), we cannot achieve quality survival.

P2a There is no supernatural escape should we destroy nature.

P2b Technology and human constructs cannot assuredly provide an escape from our dependency on nature.

P3 If something is of the highest importance then the necessary conditions of it are also of the highest importance.

Thus, Nature is of fundamental and paramount importance.
Works Cited


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Two recent books that I have found provocative in relation to the project of refining naturalistic ethics, or moral anthropology are Simon Blackburn’s *Ruling Passions* and Robert B. Louden’s *Kant’s Impure Ethics*. 
250 copies of this volume, Valuing Nature, were published by the Environmental Studies Program at Bowdoin College. The design is by Thomas Cornell with Edward Geis. The typeface is Garamond. Editorial facilitation was by Becky Koulouris and final management was provided by A. Myrick Freeman III. Publication was enabled by the William D. Shipman Professorship Fund and the Psi Upsilon Environmental Studies Fund.

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Cover: Clamdigger. 1989. Oil on canvas. 54 × 60"
Title page: Basswood Tree. 1975. Etching. 15\(\frac{1}{4}\) × 18\(\frac{3}{4}\)"
Colophon: Bacchant in the Woods. 1975. Etching. 15\(\frac{1}{4}\) × 18\(\frac{3}{4}\)"
Back Cover: McEwen’s Garden. 1997. Oil on muslin on board. 16 × 24"