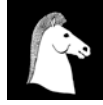




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Artefacts and Functions: A Note on the Value of Nature

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ABSTRACT: This paper examines and compares the ontological and axiological character of artefacts – human creations – with nonhuman natural entities. The essential difference between artefacts and natural entities is that the former are always the result of human intention and design, while the latter are independent of human purpose. Artefacts have functions; natural entities do not.

The connection to human intentional purpose implies a different kind of value for artefacts. Artefacts are evaluated solely by their instrumental (and anthropocentric) use, while natural entities can be appreciated for their independent and autonomous existence.

This distinction has normative implications, especially for environmental policy and the development of an environmental ethic. Intervention in natural processes, even to ‘improve’ nature, must be limited, for human action changes natural entities and systems into artefacts. A moral imperative requires respect for the autonomy of nature and resistance to the human domination of nature.

KEYWORDS: Ecological restoration, environmental sustainability, biological function, environmental ethics, natural value, artefacts, autonomy

I.

Consider the character of artefacts as human creations. Artefacts are conceived and designed to meet the demands of human need or purpose; they are tools for the achievement of human tasks. Not all artefacts actually fulfil the purposes for which they were intended; often, artefacts designed for one purpose are used in unforeseen or different contexts. Nevertheless, the artefact would not exist at all if some purpose had not been foreseen for it; artefacts are created to meet a specific human need.

Artefacts thus stand in a necessary *ontological* relationship with human purpose. The existence of a human purpose, a human intention, is a *necessary* condition for the existence of the artefact. Human purpose and intention are clearly not *sufficient* conditions for the characterization of an entity as an artefact,

for some things are the result of human intentions although we would hesitate to call them artefacts. Human infants, for example, may be the result of intention and purpose. Inter-human relationships – for example, my friendship with John – may also be intentional.

However, although human creations other than artefacts may exhibit intentionality, natural entities do not. Natural entities, insofar as they are natural, are not the result of human intentions. The necessary ontological relationship with human purpose serves to distinguish artefacts from natural entities. In this essay I examine the nature of this distinction and its normative implications.

II.

An anthropocentric world-view places humanity and human interests at the centre of value. From the perspective of anthropocentrism, the world exists for humanity; the world is the complex of objects and systems that form the material for human achievements. Technology – the design and creation of artefacts – is a central project in the development of this anthropocentric world; technology shapes the material of the world to meet human concerns, to satisfy human desires, wants, and needs. Broadly conceived, technology is any social or cultural artefact used by humans for the organization and control of nature and the world.¹

Technological products – artefacts – are thus fundamentally anthropocentric, by which I mean that their existence, purpose, and meaning all derive from the concerns of human agents, either as individual persons or as social institutions. A proper understanding of artefacts is tied inextricably to an analysis of function and purpose. Artefacts are instruments or tools for the betterment of human life. They can only be understood as anthropocentric instruments.

The anthropocentric instrumentality of artefacts is completely different from the basic characteristics of natural entities, species, and ecosystems. Natural entities exist independently from human purpose or design. Living natural entities and systems of entities evolve to fill ecological niches in the biosphere, not to meet human needs or interests. More clearly, non-living natural entities such as rock formations, rivers, canyons, soils (and so on) simply *exist*, without any evolutionary ‘fit’ at all. Non-living natural entities, although subject to change, do not ‘evolve’ or adapt to changing conditions in their local ecosystems. It is thus difficult even to ascribe the notion of function or purpose to natural entities.

The consideration of function and the comparison of artefacts and natural entities leads Andrew Brennan to argue that natural entities are ‘intrinsically functionless’. Natural entities were not created for a particular purpose, nor did they evolve for a specific reason, design, or plan; natural entities have no set manner of use, no role to play in natural ecosystems. We often speak as if natural

individuals and species (e.g., predators) have roles or functions to perform in the maintenance of ecosystemic wellbeing (e.g., preserving the equilibria of optimum population levels), but such talk is either metaphorical or fallacious. No one created or designed the mountain lion as a regulator of the deer population.² Natural entities are not instruments, although we humans may use them instrumentally. When we do, we graft our designs, so to speak, on to the naturally functionless entity. But outside considerations of human use, the natural entity has no purpose; since it is not an artefact, since it is not the result of a design or plan, it has no 'intrinsic function'.

It may be objected that the preceding analysis of the difference between humanly created artefacts and natural entities reinforces the very separation between humanity and nature that environmental philosophy (and an enlightened environmental policy) seeks to overcome. For too long, humanity has apparently believed that it can exist independently of natural processes. But humans are part of the natural system, and require a well-functioning natural environment to survive. Humans are themselves the products of natural evolution, the objection continues, so that human artefacts are likewise natural.

Although this objection introduces a valid concern into the proper basis of environmental policy – the interdependence of humanity and nature – an overemphasis on this useful hortatory rhetoric of the environmental movement only tends to obscure a clear analysis of the differences between the results of human action in the environment and the outcomes produced by natural processes. Humanity itself is a product of evolution, but the primary sphere of human activity is the realm of culture, the complex system of social arrangements and artefacts that was created by humanity for the furtherance of human ends. Although human cultural artefacts may exist along a continuous spectrum with natural evolving entities – my steel hammer is related to the bone, stick, or rock used by a chimpanzee in the wild – there is indeed a distinction to be made between human artefacts – machines, institutions, ideas – and the natural evolving entities of the biosphere. Human artefacts do not evolve. To say that I am using a third generation personal computer to write this essay, and that this PC evolved from earlier PCs or indeed from Turing's idea of a thinking machine, is to speak in metaphors. Real evolution only occurs in biological systems and entities, not in artefacts. Humans may use evolutionary principles as they 're-design' living artefacts, such as food crops, but here again the distinction between a process driven by human intention and one driven by natural selection is clear. Humans are in some sense natural beings; humanity requires a functioning nature to survive; but not everything humans do or make is natural. It is thus important to understand how and why human creations or artefacts are different from natural entities. Without a proper understanding of the distinction, we will lack a basis for a moral environmental policy.

III.

Since artefacts are designed for a human purpose, while natural entities evolve with no design or purpose, the lack of what Brennan terms 'intrinsic function' is the distinguishing characteristic that separates natural entities from artefacts. An example from practical environmental policy can begin to demonstrate the significance of this distinction for an ontological and axiological understanding of nature. The comparison between artefacts and natural entities reveals the foundation of natural value; the comparison explains the value of nature.

Consider the policy of sustainable forestry.³ As its name implies, sustainable forestry is a land-management policy that advocates the wise use and restoration of forests as sustainable and renewable resources. It is thus opposed to the short term expediency of present day forestry practices. Current policies often involve a maximum harvest with little regard for the restoration or maintenance of the forest as an ecosystem. Forests are treated as if they were agricultural products, tree plantations. Advocates of sustainable forestry seek to re-model the practice of forest management along the lines of natural evolution, restoration, and ecosystemic development.

From the perspective of environmentalists, sustainable forestry would appear to be a good policy, well worth advocating as a corrective to an exploitative and disrespectful misuse of natural ecosystems. But a deeper examination shows that sustainable forestry is not an appropriate improvement over short-term development, for both policies treat the forest as an artefact, an instrument for the furtherance of human interests. An analysis of sustainable forestry only reveals the wide gulf between natural entities and human-centred artefacts.

The artefactual treatment of nature within sustainable forestry policy is clearly demonstrated in Chris Maser's *The Redesigned Forest*.⁴ Maser, a former research scientist for the United States Department of Interior Bureau of Land Management, argues that we must redesign forests according to natural ecological principles, so that we become true foresters and not 'plantation managers'. Maser's position is instructive precisely because it exhibits the tension between a policy based on natural evolutionary principles and a policy based on short-term human interests. Unlike the 'forest-plantation manager', Maser attempts to create a forest policy that respects natural processes. Nevertheless, his argument and language are disturbing; the text is pervaded by an artefactual and instrumental conception of the natural forest environment.

Maser's first error is the comparison of the human design of forests with Nature's design: "we are redesigning our forests from Nature's blueprint to humanity's blueprint".⁵ Nature, of course, does not have a blueprint, nor a design, and as a zoologist, Maser knows this. His language is merely metaphorical, and it is dangerous, for it implies that we can discover the plan of natural processes and mould them to our human purposes.

Maser's second error is the comparison of nature to a mechanism. In his

criticism of current forestry practices, Maser claims that when we turn forests into plantations we assume that our design for the forest mechanism is better than nature's. Maser correctly argues that "forests are not automobiles in which we can tailor artificially substituted parts for original parts".⁶ But his argument against the substitution of artificial parts is empirical: "A forest cannot be 'rebuilt' and remain the same forest, but we could probably rebuild a forest similar to the original if we knew how. No one has ever done it ... [W]e do not have a parts catalog, or a maintenance manual ..."⁷ The implication is that if we did have a catalogue and manual, if nature were as well known as an artefactual machine, then the restoration and redesign of forests would be practically and morally acceptable.

For Maser, restoration or sustainable forestry is acceptable because it more likely furthers human long-term interests. Thus, the third problem in this argument for the redesign of forests and forestry policy is that its foundation is irredeemably anthropocentric. The central problem with current practices is that they are "exclusive of all other human values except the production of fast-grown woodfiber".⁸ What concerns Maser is the elimination of other human values and interests. "We need to learn to see the forest as the factory that produces raw materials..." to meet our "common goal[:] ... a sustainable forest for a sustainable industry for a sustainable environment for a sustainable human population".⁹ Sustainable restoration forestry is necessary because it is the best method for achieving the human goods that are extracted from nature. By using the complex knowledge of forest ecology, foresters will achieve the goal of building a better 'factory-forest'.

As an environmental policy, the idea of rebuilding and redesigning sustainable forests is, at the very least, extremely odd. Even a cursory examination of the concept of sustainable restoration forestry reveals the anthropocentric value system that lies at its core. The management and control of natural systems alters their natural character; management and control creates artefactual systems, which, at best, *resemble* nature. The redesign and management of natural systems is thus a paradox: once human intervention occurs, there is no longer a natural system to be preserved, there is only an artefactual system.

The example of sustainable forestry thus serves to illustrate the conceptual distinction between artefacts and natural entities. The goal of sustainable forestry is the creation of forests that best suit human purposes; these forests are thus artefacts, designed and developed for a human function, even in the limiting case where the *sole* purpose for the creation of the forest was the replication of the natural. The managed sustainable forest is (arguably) an improvement over a forest plantation; but the managed forest is still different from a natural forest, even if it appears similar, even if it develops according to the same evolutionary and ecological principles. The managed forest, as an artefact, owes its existence to intentions of human agents; the natural forest exists independently of human intention. The natural forest exists because of a historical and evolutionary

process, not as the result of a human plan or design. The natural forest has no purpose, no intrinsic function; unlike an artefact, or an artefactual system, it is ontologically independent from humanity.

IV.

The human intervention in and management of natural systems thus creates artefacts whose value is centred on human interests and purposes. A consideration of these artefacts, as in the policy of sustainable forestry, reveals the difference between human-centred artefacts and independent natural entities. This analysis of the difference in the ontological and axiological character of artefacts and natural entities has clear implications for normative ethics, and ultimately, for environmental policy. I argue that there is a moral obligation to preserve non-artefactual natural value, even as it exists independently from human projects, plans, and interests.

The central normative issue in this discussion is the possibility of the moral ‘consideration’ of nonhuman and non-living natural entities. This non-traditional and nonhuman-based moral consideration requires the determination of a plausible non-arbitrary criterion for nonhuman moral value. Since its inception, the field of environmental ethics has attempted to broaden the notion of moral considerability beyond the traditional limits of human-based criteria (such as language ability, rationality, or self-consciousness). Thus Paul Taylor has argued for a biocentric ethic which entails moral respect for all living (natural) entities.¹⁰ The basis of this biocentric attitude of respect is the recognition that every living entity has a good-of-its-own; each living being is a “teleological centre of life”.¹¹ Similarly, Robin Attfield has argued for “the good of trees” on essentially Aristotelian grounds: “the good life for a living organism turns on the fulfilment of its nature”.¹² But the notion that non-conscious (and non-rational) living entities have an intrinsic or inherent good has been questioned. R. G. Frey, for example, suggests that a broadened notion of welfare, good, or interests cannot be limited to animals and other living entities. If we are going to talk of the good for nonhuman animals and plants, then we are also going to have to talk of the good for machines and other human artefacts: a tractor ‘needs’ oil to run well; oil is a good that enables the tractor to fulfil its nature.¹³

The possibility of determining value for natural entities thus requires a clear distinction between artefacts – such as Frey’s tractor – and living entities as teleological centres of life and activity. Gary Varner has recently argued for the consistency of this distinction by focusing on the ‘biological functions’ of living entities as opposed to the ‘artificial’ functions of machines and artefacts. Unlike a machine, a living entity has needs, interests, and goods because it has biological functions, adaptive subsystems that served an evolutionary purpose in the survival of its ancestors.¹⁴ The interests and goods of the living entity are based

on the aetiology of the species; the interests and goods – if we want to call them that – of the artefact depend on the purposes ascribed to the artefact by human beings.¹⁵ Holmes Rolston reaches the same conclusion by a consideration of organisms as ‘self-maintaining systems’ within ecosystems and habitats: “there exist ... systemic requirements by which the organism is tested as fit or misfit”. The ecosystemic fitness of an organism is part of its nature. Artefacts have no nature of their own, merely the purposes given to them by human interests.¹⁶ Biological and ecosystemic functions are thus the distinguishing characteristics of living entities (as opposed to artefacts); this distinction permits the possibility of the moral consideration of nonhuman living entities without the problematic inclusion of artefacts.

But the distinction between artefacts and natural *living* entities is not by itself an adequate basis for the determination of moral value in nature. First, considerations of natural teleology, biological function, and ecosystemic fitness exclude artefacts from moral consideration at the cost of excluding *nonliving* natural entities. Such an exclusion is too broad: the consideration of nonliving natural entities must be part of any comprehensive environmental ethic. There *is* a difference between artefacts and natural nonliving entities, but this difference is not describable in terms of ecosystemic or biological function, because none of these entities are alive. Nonetheless, the distinction is important for understanding the moral basis of environmental policy. A broadly conceived environmental ethic follows the holistic model of Aldo Leopold, so as to include soils, waters, mountains, the atmosphere – in sum, what Leopold termed ‘the land’ – in the domain of moral value and moral consideration.¹⁷ It is an ethic that is concerned with both the living and nonliving elements of the biotic system, and with the relationships between them. Thus a principle of ‘biological function’ which eliminated the nonliving elements of the environment would exclude too much. A second problem is that the Leopoldian environmental ethic which I seek to elaborate will exclude so-called ‘living artefacts’, such as domesticated animals, biologically engineered species, and forest plantations. These human created entities have no place in an environmental ethic since they are not natural entities. The crucial distinction then is not between living beings (with biological functions) and nonliving ‘things’, but between artefacts and natural entities, considered as living or not.

The ethical importance of the distinction between artefacts and natural entities is thus derived from the anthropocentric nature of artefacts, their ontological reliance on human interests, plans, and projects. In contrast to natural entities, artefacts, as human instruments, are always a *means* to the furtherance of some human *end*. The normative implication of this relationship can be found in the practical moral philosophy of Kant, if we are willing to look beyond the boundaries of human rational subjects. The second formulation of the categorical imperative states that we are to treat moral subjects as ends-in-themselves, never as a mere means. If the categorical imperative is applied to a treatment of

artefacts and natural entities we find a crucial difference: artefacts must be treated as means, for their existence and value only exists in a dependent relationship with human aims and goals; but natural entities, existing apart from human projects, can be considered as ends-in-themselves. Kant teaches us that the possibility of moral consideration lies in an entity's independence from rational control and design, its existence as an end-in-itself.

This consideration of Kantian moral concepts *suggests* that two crucial notions in the development of an ethical environmental policy are the Kantian ideal of 'autonomy', and its moral opposite, domination. In analysing the value of natural organisms, Rolston writes: "the values that attach to organisms result from their nonderivative, genuine autonomy ... as spontaneous natural systems."¹⁸ This is not true merely for organisms. Complex holistic natural systems and communities also exhibit autonomy, in that they are independent from external design, purpose, and control. Even non-living natural entities, which do not, in themselves, develop, grow, or achieve self-realization, are essential components of autonomous natural systems. When humans intervene in nature, when we create artefacts or attempt to manage environmental systems (such as forests), we destroy that natural autonomy by imposing a system of domination. As Eugene Hargrove notes: "Historically, manipulation of nature, even to improve it, has been considered subjugation or domination."¹⁹

But why is the domination of nature a moral evil? Why are the products of the domination of nature less valuable than the products of a free and autonomous nature? It is clear that in the realm of human social and political thought, domination is an evil that restricts or denies individual (and social) freedom. Can the metaphor of domination be translated into the realm of nonhuman natural processes? Yes: within environmental policy, domination is the anthropocentric alteration of natural processes. The entities and systems that comprise nature are not permitted to be free, to pursue their independent and unplanned courses of development, growth, and change. Thus, the existence of domination results in the denial of free and unhindered growth and development. Wherever the process of domination exists, either in nature or in human culture, it attacks the pre-eminent value of self-realization.

I am not claiming that all self-realization is a moral good; even some forms of human self-realization can be morally evil. Thus a much larger question, for both environmental policy and normative human ethics generally, concerns the exploration of criteria for justifiable intervention in the free and autonomous development of human beings, natural organisms, and natural systems. I do not claim to establish a 'criterion for intervention' in this essay. My point here is more simple: the denial of the self-realization of natural processes is a crucial part of the human domination of nature.

The creation of artefacts is thus central to the human project of the domination and subjugation of the natural world. Artefacts enable humanity to control the forces of nature for the betterment of human life. Generally, this artefactual

control of natural forces is not a moral evil: the processes of agriculture, engineering, and medicine are necessary for the fullest possible development of human life – *human* self-realization. But the management, alteration, and re-design of nature results in the imposition of our anthropocentric purposes on areas and entities that exist outside human society. Intervention in nature creates environments based on models of human desire. This is the human project of the domination of nature: the reconstruction of the natural world in our own image, to suit our human goals and purposes.

The ontological and axiological distinctions between artefacts and natural entities are drawn most clearly when we consider the artefactual reconstruction and control of natural entities and ecosystems – when we turn wild and natural forests into tree plantations or ‘sustainable’ woodland. Artefacts are fundamentally connected to human concerns and interests, in both their existence and their value. Natural entities and systems have a value in their own right, a value that transcends the instrumentality of human projects and interests. Nature is not merely the physical matter which is the *object* of human artefactual practice; nature is a *subject*, with its own history of development independent of human cultural intervention. As with any autonomous subject, nature thus has a value that can be subverted and destroyed by the process of human domination. The normative implication for environmental policy is that this value ought to be preserved.

NOTES.

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¹ See for example Jarvie (1983: 61), who writes: “Technology ... is coterminous with our attempts to come to terms with our world...”

² Brennan, 1984.

³ The argument concerning ‘sustainable forestry’ is developed more fully in Katz, 1992.

⁴ Maser, 1988.

⁵ *Ibid.*, p. xvii.

⁶ *Ibid.*, pp. 176-7.

⁷ *Ibid.*, pp. 88-9.

⁸ *Ibid.*, p. 94.

⁹ *Ibid.*, pp. 148-9.

¹⁰ Taylor, 1986.

¹¹ *Ibid.*, p. 100, and pp. 60-71, 119-29.

¹² Attfield, 1981. For a further discussion, see Attfield, 1983, pp. 140-65.

¹³ Frey, 1979.

¹⁴ The living entity does have biological functions – its parts serve the well-being of the whole – but it itself is intrinsically functionless, not having been designed for a specific

role in the environment.

¹⁵ Varner, 1990. Varner bases his argument on Larry Wright's (1976) analysis of function.

¹⁶ Rolston, 1988, pp. 97-105.

¹⁷ The classic statement of this position is in Leopold, 1949.

¹⁸ Rolston, p. 105.

¹⁹ Hargrove, 1989, p. 195.

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