

## **Evolution and the Goal of Environmentalism**

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### **Abstract**

The goal of environmentalism is at least to protect the environment. At a suitably high level of abstraction it is fairly clear what that involves: for example, assuring that Earth remains a place that can sustain life. Yes, but what sorts of life? How should different life forms be distributed geographically? The truth is that easy platitudes do not take us very far because they are insufficiently granular, and therefore it is not immediately clear how we can best satisfy the demand to protect the environment. This paper is an attempt to identify plausible environmental principles that are politically possible to implement on a global basis. To this end, principles will be based upon a vision of the relation of humankind to nature that appeals to all people and will be designed to minimize the sacrifices that implementation will require.

### **Two Policies Concerning Evolution: Process and Outcomes**

Human beings are by far the most successful species ever to have populated Earth. In the course of at most a few hundred thousand years, human beings have managed to dominate the Earth so completely that most species persist or perish only at the pleasure of human beings. The species that are the most durable and successful in resisting the sweep of humanity have not been the largest or the fastest. Rather they are the smallest: microbes that somehow elude us and adapt through mutation to defeat our relentless assaults upon them; yet, to this point, even stubborn microbes, like smallpox, have eventually yielded to the human will, in some cases driven to the point of extinction.

Human beings, in virtually everything we do, affect the course of evolution itself, and it is obvious that environmentalism will be a coherent program only if it takes a plausible view of the proper role of human beings in determining evolutionary outcomes. Though human beings dominate the planet, other creatures also affect evolutionary development. In fact, whenever two species compete over the same territory for the same food sources, the one that reproduces the fastest will ultimately dominate—displacing and destroying or at least forcing its competitor through transformative mutations. The course of evolution is the result of the process of natural selection, as it is called. Indeed, species come and go as they appear as particularizations of the ever-changing biomass. Tracking the details of speciation would appear to provide a special opportunity for intellectual modesty. We have hardly catalogued existing species, much less the ones that have gone before, and theories about the transformative processes that have determined the course of evolution remain more or less unsettled.

The fairly simple nineteenth century model of evolutionary change has been complicated during the twentieth century by analyses of dynamic systems and feedback loops between changes in eco-systems and genetic transformations. Indeed, the very concept of a ‘species’ is now controversial. One definition recently proposed is that specie is ‘a functional (reproductive) set

of genetics at dynamic equilibrium within the adaptive (and holographic) context of its local ecosystem.’ (Cawley, 2010, p. 12) More sophisticated theories of speciation reduce species change to genetic change. Even so, in the long run, survival and population growth are probably the best measures of adaptive success. Indeed, what else could ‘success’ mean? Serious, popular literature is replete with alarming reports of ecological threats to native habitats and hence to the survival of species located within them. For example, various species of birds (Rosenthal, 2011) and of frogs (Dixon, 2011) are now threatened by encroaching civilization. Although the dangers many be overstated, some fear that entire ecosystems are threatened, including the Belize Barrier Reef, the Congo Basin, the Everglades, and the Tahuamanu Rainforest. Whatever the urgency, it is clear that the process of speciation will be affected by the policies we adopt in managing the environment. Among the most important policies will be those that regulate human activities that affect climate, which in turn affect biodiversity over a wide range of geographic regions. Managing the environment involves humans in the course of evolution in ways in which other species are not involved; to wit, by taking decisions that affect evolutionary outcomes.<sup>1</sup>

Humans may choose to alter the course of evolution not only to assure our dominance over other species but also to shape the environment for our own purposes, and it is at this point that the values we choose to promote will be most apparent and carry the most important implications for the course of evolution itself. We domesticate animals, change the forests into pastures for the production of food and favor some species over others solely for our own pleasure: for example, by creating beautiful gardens of delicate flowers at the expense of hardier weeds. The fundamental question that we face in developing environmental policy is in part a *philosophical* rather than a scientific or technological question: *The question is really whether Earth and everything it exists for human beings alone or whether we should humbly take our place among the others species.* If the right answer takes the side of humility, then we must ask just how humble should we be? How large should the human population become; at what point should it be restrained? How much of Earth should be reserved for other creatures? In order to think more clearly and systematically about these issues, I have proposed (Dreher, 2002 p. 26ff) a distinction between two extreme views of our role on Earth; those extreme views will essentially serve as markers at each end of the range of policies that could define our relation to other forms of life.

The first I call the Process View. According to the Process View, in its purest form, human beings should be content with the outcome of evolution, competing with other species only to the extent that other species compete with us; that is, competing only for the resources that are necessary for our reproductive success. On this view, we should accept whatever is the outcome of the process, even if we find it disagreeable, as long as it does not undermine our own

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<sup>1</sup> See Anderson M, 2010, (especially) pp. 4–8 for a detailed discussion of the subtleties involved in modeling and predicting the effects of climate change on biodiversity and ecosystems.

prospects for survival. The Process View is naturally contrasted with the Outcomes View, according to which humans should shape the evolutionary process to suit our own needs, goals and ambitions; this implies that we should actually take control of the evolutionary process, determining which species survive and which perish. Through genetic engineering, we may even be able to create (or to re-create) species for our own purposes. These views are polar opposites; they are obviously extreme, and each is very implausible in unqualified form.

The Process View, which takes a hands-off policy concerning all developments that do not directly affect our reproductive success, appears to be insufficiently restrictive, as it might tolerate evolutionary outcomes that materially reduce the diversity and richness of life. On the other hand, the Outcomes View is arguably too restrictive insofar as permits or even encourages the destruction of native habitats solely in order to increase the human population at the expense of other creatures. Protagoras claimed that man is the measure of all things<sup>2</sup>, but can the great Sophist be reasonably understood to mean that nature itself is good if and only if it pleases us? Does anyone really want to say that it would be a good idea, however much the thought may flatter us, for human beings to propagate indefinitely at the expense of all other life forms, except of course those favored as pets or food sources? Indeed, even on the most hegemonic understanding of our role in nature, according to which God gave humans dominion over all the Earth, God did not grant us the privilege of eradicating other, lesser creatures; in fact God has at times required humans to care for lesser creatures. He did command Noah to build an ark to save the animals of Earth as well as his own family!

### *Tertium Quid*

Surely environmentalism needs to find a middle course between the Process View and the Outcomes View that will strike just the right balance between the interests of human species and other life forms on Earth. The middle course will essentially be defined by principles that rationally guide environmental policies. I suggest that we begin our search for a middle ground between the Process and Outcomes view in simile and metaphor. I concede that simile and metaphor are hardly the ideal starting points in philosophical inquiry, but sometimes they are the best that we have. Metaphors can inspire and guide rational debate among proposals, and sometimes they enable us to solidify agreement about fundamentals. I suggest that we begin our policy deliberations with this guiding vision: to view ourselves as stewards of Earth, just as gardeners are viewed as stewards of the parts of Earth entrusted to them. It is significant that we are not only keepers of the Earth, but we are among the fauna of our Earth-garden, and we depend upon the flora and fauna of the Earth for our own existence.

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<sup>2</sup> Plato's Socrates refers to Protagoras's doctrine at *Theaetetus* 160d (Jowett, 1953, p. 256), and compares it with the view of Homer and Heraclitus, to wit that all is flux. By implication Socrates criticizes the view of Theaetetus that fleeting, subjective *perception* is knowledge. Socrates attributes to Protagoras the view that what we count as good depends upon our perception at the moment. This view is Plato's view (of Socrates' view) of Protagoras, and it is based merely upon the two brief fragments remaining of Protagoras's lost work: *Truth*.

There are a wide variety of gardens, including formal gardens, naturalized gardens, gardens designed to produce fruit or vegetables, and botanical gardens devoted to organized displays of various plants. Virtually every culture in the world assigns value to gardens that preserve nature in cultivated or naturalized forms. In this broad sense, national parks and forests may be properly views as gardens. In the West, our thinking is still informed by the Biblical vision of the garden, a place of repose and harmonious interaction with nature. There are counterparts of the Biblical vision in virtually all cultures, from least to most sophisticated. Viewing the Earth as our garden inspires the thought that nature is to be respected, even treasured.

That we should view ourselves as stewards of at least a *part* of Earth is by now virtually beyond dispute. For example, there is virtually worldwide acceptance of national parks and wilderness areas; however, the vision urged here goes much farther as it requires us to view *all* the Earth as our garden. Moreover, although the general principle of respect for nature is widely accepted, the *implementation* of the general principle is extremely controversial, not least because it threatens entrenched economic interests to a considerable degree. For example, it places constraints upon the use of natural resources that go beyond anything contemplated in Locke, who is perhaps the seminal voice in modern Western philosophy when it comes to defining our relation to nature. Famously Locke proclaims that we may claim natural resources for our own private purposes. Some have perhaps taken this doctrine to sanction pollution for private economic advantage, but this inference is quite unfair because Locke includes a crucial qualification: that we may claim natural resources of our private use only as long as we leave ‘*enough and as good for others.*’ (Locke, *SGT*, 1690, ¶33, p. 277, my emphasis) Furthermore, although Locke does not recognize non-human rights, it seems clear that his deep religious convictions commit him to respect God’s creation. I am not the only one to read Locke in this way. Alexander Fraser argues that Locke conceives *revelation* in two senses: the narrower is the customary sense of a direct communication from a supernatural source; the wider is ‘the whole evolution of the universe, in nature and spirit,’ which ‘is a revelation of God’ (Locke, Fraser, ed, *ECHU*, IV: xvii, fn 4, p. 416).

Hugo Grotius, whose seminal works of the early seventeenth century also champion private property, sought to develop a largely secular conception of natural law.<sup>3</sup> Nevertheless, Grotius undeniably turns to ancient, quasi-religious conception of nature for inspiration. He appeals to Cicero’s doctrine that it is the right of the community to share all that ‘nature gives humankind for common use,’ including the sea and the air.<sup>4</sup> Whether deriving ultimately from the God of Abraham or from ‘nature,’ early seventeenth century thought clearly recognizes that certain

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<sup>3</sup> Even so, Grotius does not side with secular philosophers like Hobbes who rejects all appeals to religion to justify the state. Arguably, Hobbes’s main philosophical goal is to justify the subordinate church to state. See, for example, (Sherman, ed., 1937 p.xiii). Grotius on the contrary is looking for justification of natural law that respects religious inspiration but does not rely upon any particular religion.

<sup>4</sup> For an extended discussion, see (Staumann, 2006, especially p. 314).

‘common goods,’ like the sea and the air, cannot be appropriated indiscriminately (i.e., despoiled for profit) without violating ‘natural law.’

To be sure Locke’s view is anthropocentric, and the view of Grotius, which was inspired by the ancient Greeks and Romans, is only marginally closer than Locke to contemporary secular justifications of environmentalism that see nature as something to be valued in itself (and not for religious reasons or merely for our own sake). As we have seen, even Locke and Grotius, two champions of private property, enjoin us to leave ‘enough and as good for others,’ which invites the question: Just who are the ‘others’?<sup>5</sup> Certainly they include existing human beings, but plausibly include *future* generations as well as our own. For example, Parfit argues that we have a moral reason to preserve the environment for the subsequent generations even if we cannot identify any particular persons who would benefit by our act. This significantly broadens Locke’s requirement. (Parfit, 1982, p. 119)

Yet the proper question is broader still: What should we say of other, non-human forms of life? Suppose that we envision a scenario under which human beings will become extinct, perhaps due to the uncontrollable onslaught of a natural enemy or to acts of self-destruction. Even then, I suggest, we should do our best to leave Earth much the way we found it, hopeful that evolutionary processes of speciation would eventually engineer the re-emergence of intelligent life. This guiding vision, inspired by the image of stewardship, is an attempt to inspire public policy that sees nature to be something properly valued in itself.

The guiding vision, that we ought to view ourselves as stewards of Earth, is neither original nor parochial, but it is just for that reason that it appears to be a reasonable starting place for environmental policy. It is reasonable if only because environmental challenges are obviously *planetary*, and dealing with them successfully depends upon building a consensus among the peoples of the world.

### Three Tentative Principles

If respect for nature is a principle that is shared by virtually all people, we nevertheless shall do well to interpret ‘respect’ liberally, as more demanding conceptions of respect are more likely to offend established interests and thus disrupt emerging consensus. Some objections that are likely to be brought against environmentalist programs are that they are: **(A: Overly Restrictive)** Current dangers to the environment are exaggerated and do not warrant restrictive policies. **(B: Pointless or Impractical)** The Earth has already been polluted to an irreparable degree, and consequently there is no point in adopting merely moderate environmental

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<sup>5</sup> Peter Singer acknowledges our debt to Locke, but worries that the ‘enough and as good’ doctrine cannot be made to apply to resources like the atmosphere, as any degradation of the atmosphere degrades it for all people. (Singer, 2002, pp. 2–31) This insight is crucially important for any environmental policy.

restrictions that will inconvenience without doing substantial good. On the other hand, onerous restrictions will be impossible to implement. Therefore environmentalism as a social program is pointless or impractical. **(C: Unfair)** The first nations to become industrialized have been unfairly advantaged because their development was not impeded by environmental concerns; whereas developing nations are now inequitably asked to hold themselves to higher standards; and **(D. Contrary to Human Nature)** Global policy constraints on the use of natural resources out of respect for nature will undercut the human spirit by frustrating the basic human need to explore and develop Earth and its resources. With these worries in mind, perhaps the following three environmental principles are worth exploring.

A principle that immediately suggests itself is *restraint*: To take from nature only what is necessary for our own species; leaving ‘unimproved,’ naturalized parts of Earth to develop on their own. It may be protested that people and nations cannot agree about much of anything and that therefore it is unlikely that any part of Earth will be left undisturbed by nation states eager to advance themselves. Yet, as we have seen, when it comes to the environment in the technological age, it is just impossible for nations or even individuals to follow their own policies. What affects anything in the environment surely affects everything; this has two important consequences. *First* we must guard against threats to our own survival, which may be *self-imposed* (for examples, by war, nuclear disasters, and catastrophic errors in genetic engineering); or else may arise from *exogenous* sources (for examples, from competing life forms and natural disasters). Even a few weeds or predators will destroy a garden if not promptly countered; indeed, without any human interference, nature would reassert itself and reclaim the civilized world. *Second*, we must be mindful of the devastation caused by spreading civilization. Industrial pollution unchecked will surely make Earth less hospitable if not uninhabitable for a large variety of creatures. In the worst case scenario, the havoc we wreak will upset the balance of nature, which in turn will undermine our own prospects for survival. These dangers will perhaps inspire a tentative, thoughtful policy that respects nature and our place within it; to wit:

**Principle of Restraint:** Human interference with evolution must not reduce the overall capacity of the environment to sustain life.

A second principle seems to follow directly, almost as a corollary from the first.

**Principle of Repair:** *The rate at which the flotsam and jetsam of civilization are removed from the environment must meet or exceed the rate at which nature is despoiled by them.*

Flotsam and jetsam are leftovers: oil slicks, increased levels of atmospheric carbon dioxide, garbage dumps on land and at sea, spent radioactive fuel, devastation of war. Obviously if the principle of repair is not followed, at some point the destruction of the environment will become inevitable.

As earlier observed, there may be a need for a policy that constrains the growth of the human population because the larger the portion of nature's bounty that humans consume; the smaller the remaining portion will be for other creatures. We have stressed the need for global consensus, and any proposal to restrict the growth of the human population is likely to meet to considerable opposition and hence to threaten emerging consensus. Fortunately, what is troubling is not really the growth of the human population itself, but rather the correlation of the growth of the human population with the increased consumption of resources. Technological advances may permit the growth of the human population without increasing the consumption of Earth's resources. This suggests the following:

**Principle of Balance:** *The portion of Earth's resources consumed by human beings as opposed to non-humans must not be allowed to grow, at least for the time being.*

The principle of balance is an attempt to articulate a policy proposal that limits the hegemony of humans to its current level, but that is not to imply that it is necessary to limit growth of the human population, at least under current circumstances.

The principle of balance has implications not only for the growth of the human population but also for the growth of certain non-human life forms. If the current balance of human/non human consumption of resources is to be maintained, we shall need to answer questions about whether or not all non-human life forms should be considered to be equal. The only plausible answer is that we in fact must regard some living things clearly unequal, in fact as food sources for ourselves (and perhaps for domesticated animals). Moreover, the efficient production of food currently involves genetically engineered life forms. Genetic engineering obviously involves the manipulation of the evolutionary process to the advantage of some life forms over others. Is there a plausible policy principle that limits human interference with the natural course of evolution? It would appear to be reasonable to allow genetically engineered food sources (and medicines) for humans and domesticated animals, although it is unclear what justification there might be for further direct intervention with evolution.

Respect for nature, as I conceive it, boils down to restraint, repair and balance; observing these principles will make it unlikely that environmental conditions will deteriorate from current levels, meaning that Earth will remain at least as hospitable to life as it now is; the ratio of waste generated to utilized resources will not increase, and the portion of Earth's resources consumed by humans will not increase. The principles of respect, repair and balance suggest how public policy might be structured to develop a middle ground between the hands-off approach of the process view and the total-control approach of the outcomes view.

## Prospects for Consensus: Worries and Objections

It would be unreasonable to expect an *a priori* justification of the policy of respect for nature envisioned here. The policy will commend itself only to those who view themselves as stewards of Earth. I believe that virtually all human beings want to protect the Earth. Yet, even relatively modest proposals are likely to inconvenience and even offend established interests. There are doubts about the policies currently required by respect for nature, for example endangered species requirements or controls on atmospheric emissions. As observed earlier, we should expect a variety of objections even to moderate environmental policies.

**A Overly Restrictive:** The first possible objection is that present proposal unnecessarily limits possibilities for human growth and expansion. How do we know that we cannot afford a bit more pollution or that the Earth cannot sustain significantly greater numbers of human beings without adversely affecting the course of evolution? The answer is that we do not know those things. Why then adopt principles that are as restrictive as restraint, respect and balance?

To answer this objection we need to focus on the dynamics of (human) population growth and of the depletion of resources. Once we allow growth in the human population or in the consumption of resources, it is very difficult to reverse course. For example, the policy to limit population growth in China is essentially an attempt to halt or reverse increases in the human population in that nation. Yet the policy is extremely unpopular and is likely to lead to demographic imbalances between males and females that may threaten social stability in the long run. Stringent policies limiting population growth are almost impossible to implement and to sustain, and from many religious and moral perspectives are intrinsically objectionable. Moreover, increases in resource consumption are generally accompanied by the creation of vested economic interests, which are difficult to dislodge. These considerations suggest that we follow *conservative* principles in adopting demographic and resource allocation policies if only because we know how difficult it will be to gather support to reverse those policies if they turn out to be mistaken. We can always pollute more; we can always provide incentives to increase the human population.

**(B: Pointless or Impractical)** Another objection to the present proposal is that it is either pointless or impractical: Perhaps it will be urged that environmental damage is so extensive that it cannot be corrected without adopting extreme measures that are restrictive beyond anything envisioned in this paper. The moderate measures advocated here will not be sufficient to undo the grave damage that the environment has already sustained, and stringent measures will be impossible to implement. Consequently environmentalism is a failed vision.

Fortunately, this lugubrious conclusion has not been established. Perhaps the most important issue at present concerns the degradation of the atmosphere due to greenhouse gas emissions. The three principles envisioned here obviously require policies that will halt the degradation of the atmosphere. Far from being pointless or impractical, some research indicates that advances

in efficient use of energy, renewable energy technology, and nuclear technology (safely implemented of course), as well as economic incentives could in fact *reverse* atmospheric degradation while actually *increasing* living standards. (Matsuhashi, *et. al*, 2010, p. 10)

Nevertheless it is true that ambitious policies intended to reverse environmental damage are difficult to implement, however sensible they may be. Even devices like carbon taxation envisaged by Matsuhashi, *et. al*. have been difficult to adopt. The middle ground envisioned here appears to have a higher probability of implementation than more restrictive policies. As I see, the *immediate* goal of policy is to prevent further degradation of the environment. Policies intended to reverse the damage should be introduced only after the first necessary steps have been taken to halt further damage. It will pay to remember that those who demand too much often are forced to settle for too little.

**(C: Unfair)** One of the difficulties in building consensus for environmental proposals like the present one is that not all societies, much less individuals, have benefited from industrialization to the same extent. Some nations profited from early industrialization and in the process despoiled nature before relatively less well-off regions even began to industrialize. Even within prosperous countries, many less privileged have been left behind economically while the more privileged have left behind a relatively large carbon footprint. There is voluminous literature on distributive justice that is written from the purely philosophical standpoint in the hopes of finding just the right formulas for distributing burdens and benefits. Philosophers like Rawls and Sen have argued that justice requires that all humans enjoy minimum benefits, but just how those benefits are to be defined is a point of considerable controversy. Rawls takes the most conservative approach, arguing that justice requires equal liberties among those having ‘to a sufficient degree the requisite powers of moral personality and the other capacities that enable them to be normal and fully cooperating members of society over a complete life.’ (Rawls, 2001, p. 18) These rules imply equal opportunity among moral agents to advance within developed societies, but Rawls emphasizes that his theory is not egalitarian. Schemes that require income and wealth to be distributed equally are either ‘irrational’ or ‘socially divisive.’ (Rawls, 2001, p. 50f.) Sen takes a more liberal view, complaining that Rawlsian principles do not make provision for the development of the *capabilities* necessary to take advantage of opportunities for advancement and of the ‘freedom to live their lives.’ (Sen, 1999, pp. 81—84, 85) The views of both Rawls and Sen suggest that access to natural resources may be justifiably unequal, both with respect to persons and nations.

Other writers, like Peter Singer have taken more egalitarian views, arguing, for example, that access to the ‘atmospheric sink’ should be equalized on a per capita basis. (Singer, 2002, p. 35) This implies that carbon emissions by developed countries will need to be dramatically curtailed so that developing countries can catch up to the developed countries, and it also implies that carbon ‘consumption’ will be leveled, which entails a dramatic reduction in living standards for the privileged. Recently Brandt-Rauf has argued for a generalization of Singer’s equal access to the ‘atmospheric sink’ principle. Brand-Rauf’s view is that Singer’s principle should be

extended to all eco-systems, which presumably would include water resources, mineral deposits, forests, and arable lands. These suggestions, which are made for environmental as well as ethical reasons, are certainly justified on certain egalitarian schemes like Singer's. There is, however, something to be said against strict egalitarian schemes; to wit, that it may be possible to increase overall well-being only by adopting incentive systems that tolerate considerable inequality. The inequality might be ethically justified if the least well-off were also to benefit from increases in overall well-being. In any case, whatever the intrinsic merits of Brandt-Rauf's suggestion, the probability of its implementation is low. As Brandt-Rauf himself concedes, '...it seems that the 'life as usual' of denial and the 'politics as usual' of limited self-interest preclude any real progress toward fairness and a sustainable future for the planet.' (Brandt-Rauf, p. 8)

This paper is concerned to suggest public policy principles that (a) are grounded in common human experience (and therefore have universal appeal) and (b) can be implemented without offending established interests and without appealing to moral standards that many people find extreme or even idiosyncratic. The principles of restraint, repair and balance appeal only to the universal regard for nature and its life sustaining capacities. That, however, does not fully address the fairness objection. Can the three principles advanced here be interpreted to leave sufficient leeway for developing nations and regions to catch up to those that are already heavily industrialized? I think so. My suggestion is not an egalitarian principle but rather a principle of longitudinal justice, a principle that takes into account technological advances that facilitate the development and management of the environment. I suggest that those currently underprivileged should be given leeway to catch up to the privileged, as long as the flotsam and jetsam of the catch-up process are kept to a minimum by *current technology*. Admittedly, this may necessitate some reduction in living standards in developed regions, but certainly would not require anything as drastic as the reductions envisioned by Singer and Brandt-Rauf.

**(D: Contrary to Human Nature)** Finally, it may be objected that the present proposal purchases environmental stability and security by undermining the part of the human spirit that drives exploration and development. This objection wrestles with the type of worry that obsessed Nietzsche, especially in *Beyond Good and Evil*.

“Exploitation” does not belong to a depraved, or imperfect and primitive society: it belongs to the nature of the living being as a primary organic function; it is a consequence of the Will to Power, which is precisely the Will to Life—Granting that as a theory this is a novelty—as a reality it is the fundamental fact of all history; let us be honest with ourselves. (Nietzsche, *BGE*, 1886, ¶159)

It seems to follow that for Nietzsche merely maintaining the balance of life on Earth is a lazy, unworthy aspiration; hardly heroic in its demands or ambitions. From the Nietzschean perspective, harmony with nature is a vision of collective human life that would stagnate as one generation succeeds the next without actually accomplishing anything. This is an objection that I want to resist vigorously. In the first place, the challenge to develop technology will very likely

allow for a higher quality of life for humans (and potentially for a larger human population) without destroying the balance of nature. Although this technological challenge is not primarily physical, drawing upon virtues like courage, it makes daunting demands of its own, requiring intellectual discipline and moral virtues like co-operation and truthfulness. Securing the future of the Earth for living things will demand restraint and sacrifice, which if not heroic, are nonetheless rare.

Finally, it is important to keep in mind that our use of the planet is properly limited not only by its available resources but also by its evolutionary system of species development. I suggest that adventurous exploration that requires daring and courage and that seeks to dominate nature must turn its ambitions from Earth to neighboring planets, their satellites and to futuristic space cities. Those will be the new worlds to conquer and to develop (though I hope not to exploit). In any case, building new worlds is a project for the ages, but for now we shall best occupy ourselves with the preservation of the world that we have, in more or less the form we found it; that is what restraint, repair and balance are meant to guarantee. Adventurers need keep in mind that Earth is now and probably always will be home base. Ultimately all human projects will require the support of the mother planet.

## **Conclusion**

My goal in this paper is to develop tentative principles by which to set public policy for the purpose of preserving the environment. Unlike more ambitious schemes, I believe that the principles suggested articulate a vision of nature that appeals to all people and can be implemented without generating fierce opposition. The principles of restraint, repair and balance are designed to prevent further degradation of the environment. Once deterioration is halted, more ambitious principles and schemes can be considered to reverse whatever damage will not be undone in the natural course of events.

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