Hunter / Gatherer

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Introducing *Hunter/Gatherer*

AFTER closing down *The Wildernist*, a student conservation magazine I ran from 2014-2016, I wanted to start another journal, this time more scholarly and focused exclusively on fleshing out the main ideas of wildist conservationism. However, it didn't take long for me to realize that there are too few wildists out there for the journal to start off as developed as I would like. That was the whole reason for starting a popular magazine in the first place!

Still, shutting down the magazine was a good idea. Both I and the other executive editor found ourselves living drastically different lives than those we were living when we first started the project, and the publication's flow and structure were an odd fit for the new conditions. Furthermore, the magazine was an experiment that had by the third and final issue proven successful. We concluded that enough people care for the wild world, and enough evidence exists that it is being relentlessly trammeled by industry, that there is room for an uncompromising ethic to enter the stage and demand, with sacrifice to back it up, that the trammeling stop. This may or may not mean the end of industry wholesale, but if it does, and if this goal is feasible, then we ought to make it so.

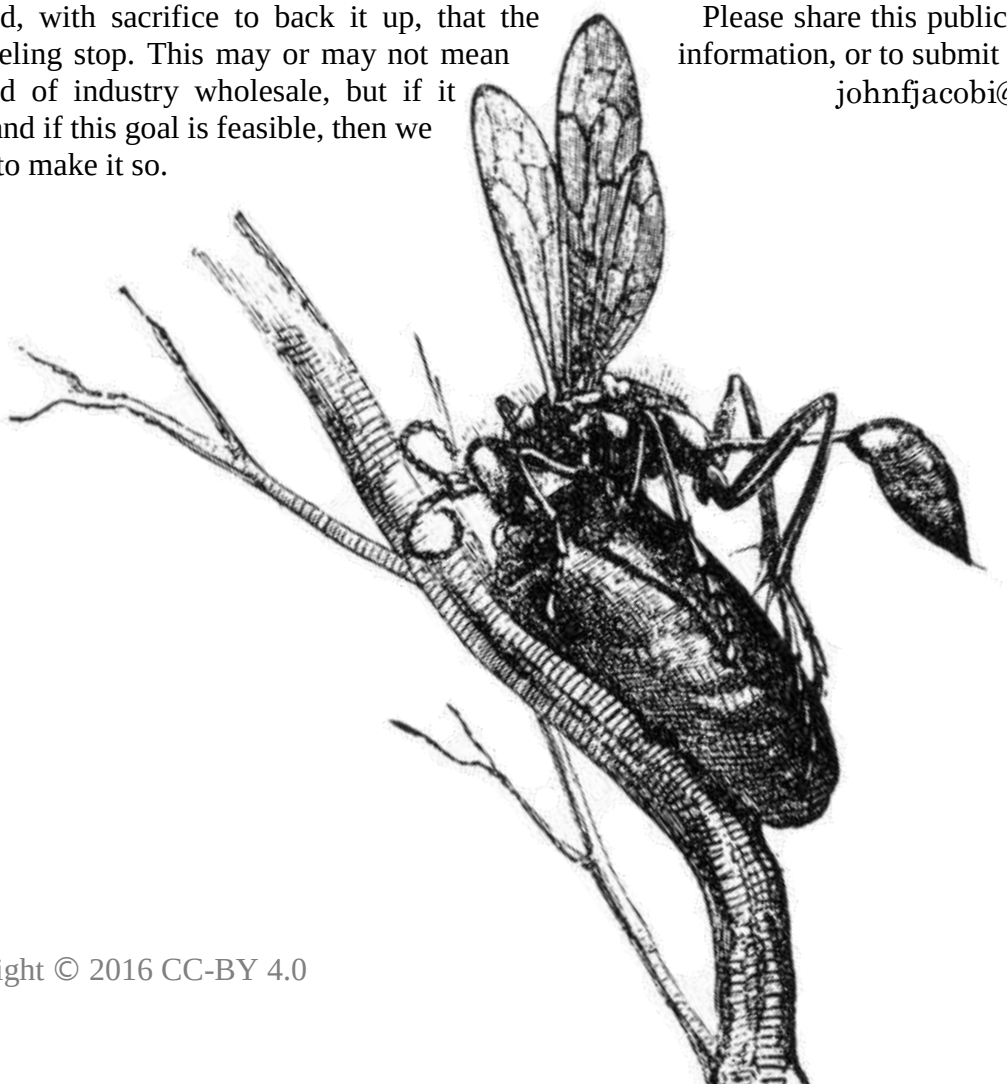
Hunter/Gatherer, then, will focus exclusively on developing the implications of these ideas, but I will be writing most of the articles, at least at the beginning, simply because I am the only one of the people working on the project who writes well in English and enjoys it. But the publication is intended to be a forum for wildists, so more contributors are expected as it develops.

My long-term goal for the publication is to use it to consolidate wildist conservationists so that we might become a notable force within the movement. No one knows exactly what that will look like, of course, but hopefully it will become clearer with more issues of *Hunter/Gatherer*. Until then, the goal is exclusively to develop a foundational and reasoned body of literature for future practical work to draw on. Thus, the intended audience is not the general public, but cadres of committed individuals willing to study the articles and, later at least, engage in whatever work is necessary to implement the ideas.

Please share this publication widely, and for more information, or to submit to the journal, email:

johnfjacobi@wildism.org.

For wild nature,
John Jacobi, 2016



Our Strategy, 2016

John Jacobi, Jeremy Grolman, Alex Kellogg

***Abstract*—The Wildist Institute is an organization dedicated to spreading the ethical philosophy of wildism and helping create a movement able to pose a real challenge to the industrial destruction of wild nature. Towards these ends, this article is the Institute's 2016 strategy.**

I. WHAT WE'RE SURE OF

This journal is meant to investigate what we don't know, but there's still quite a bit we're sure of. For example, although we are trying to decide exactly what it means to be in conflict with industry (e.g., should we wait for collapse or instigate collapse where possible?), we are sure that we ought to preserve and restore nature from the remnants left. To this end, the Institute will be encouraging at least four kinds of work through *Hunter/Gatherer*.

First, of course, is conservation work. Conservation biologists have been essential in outlining the ways current industrial practices are incompatible with wild nature, destroying the wild to a degree offensive to just about anyone's moral sense, if they have one. Furthermore, in the very act of protecting the things we love, conservation activists are bringing to the forefront the tension between nature and industry. What does it say about a civilization that extinction of non-human life is a normal part of its operation, and, worse, that conservation of that life is completely at odds with it?

Second is journalistic work. So long as the journalists stick with the facts, not intentionally bending their narrative to fit their politics, their work should be as effective as the conservation biologists. On the other hand, if they lie or distort the facts, which, even apart from being unethical, is completely unnecessary, they'll do more to inspire tension between the public and conservationists than the public and industry, hurting, rather than helping, the cause.

Third is academic work. Deep ecology has a strong academic base that sustains the intellectual foundations of the movement. There ought to be more concerted work being done specifically under the heading of wildism, particularly in the area of applied ethics.

Fourth, monkeywrenching can at times be a very effective tactic that we will not condemn, and in fact will report on when it is done strategically and for the sake of conscience, rather than the sake of simply breaking the law. What we will report on includes old tactics like tree spiking and sand in bulldozer tanks, but it also includes new tactics like whistleblowing and urban-oriented actions. We're serious about the importance of conscience, though. Dave Foreman wrote a great piece on the topic entitled "The Perils of Illegality," in which he wrote, "Be careful and deliberate in choosing the laws you break for ethical reasons, or the targets for monkeywrenching. Be sure you are justified, that you have exhausted every legal means." Please also keep in mind that *our* domain of work is wholly legal and will remain that way.

Finally, we're sure that all this work ought to be done on the basis of wildism. As explained in this issue's "The Foundations of Wildist Ethics," deep ecology has served its purpose, but it's time to focus and to no longer obscure the incompatibilities between some deep ecologists, focused on a reasoned defense of wild nature, and most of the others, who belong to left humanist movements, who espouse social progressivism, or who are interested mostly in woo woo spirituality. Rather, our resistance must be based on scientific and reasoned principles, it must be concerned with increasing the autonomy of nature, and it must reject all narratives of progress, including and especially those of the social progressives.

II. OUR WORK

One of the aims of the Institute is to build the intellectual foundations for a movement that can pose a real threat to the industrial destruction of wild nature. The core of this is the ethical philosophy of wildism, but there are other important topics of investigation to work through as well. Most of this long-term work can be divided into three general categories—wildist ethics, scientific analysis, and conservation strategy—with three tangible counterparts—the ideology, the publication, and the conservation program and projects.

A. Wildist Ethics

Most of the foundational work in this category has been done and merely needs explication. This is a primary task of the first volume of *Hunter/Gatherer*, and it has mostly been done with "The Foundations of Wildist Ethics," but no doubt some clarification essays will be necessary. After that, however, the foundations will have been set.

The next step will be to introduce wildism to environmental ethics journals. This will achieve many things, including increased credibility, a more distributed and therefore resilient movement infrastructure, and a greater field of influence. It will also ensure that the ideas will be long-lasting, since academic preservation practices are meant to withstand time. And, finally, it will allow people better acquainted and equipped to deal with philosophical conundrums relevant to wildism to address them and maybe even sort them out.

These first two steps are necessary to have a consistent and exact language for conversations about wildism *among wildists*, but the third step is to spread wildism outward, into the real world, most likely with accompanying activism. Earth First! did this with deep ecology, for example. (This is not to say that we need to do it the same way as Earth First! To the contrary, while Earth First! contributed a great to the movement for wild nature, much has changed, and our efforts must be properly attuned to the political landscape, both the broad, mainstream one, and the narrower, ecological one.)

B. Scientific Analysis

Theoretically there is a major gap that must be filled for wildists to make a proper analysis, namely, the gap in our knowledge of cultural and technical evolution. For this, there must be a synthesis between cultural ecology and sociobiology, as the former gives too little attention to human nature and the latter has major gaps that cultural ecology could fill. Those at the Institute are provisionally calling the synthesis "biocultural materialism." Sometime in the near future we will be publishing reviews on the available literature to instigate work in this area.

A second area of focus should be on human nature. Sociobiology has the most to offer on this topic, and being familiar with the concepts of evolution, evolutionary psychology, game theory, and so forth should be necessary for most wildist cadres, especially those that do journalistic or theoretical work (and by default those that do scientific work).

Finally, of course, is the work of the conservation biologists, which is already well-understood.

C. Conservation Strategy

Much of the work in the area of conservation strategy will have to be highly innovative. This is especially true given the seriousness with which we at the Institute are outlining the utter incompatibility of industry and nature's wildness. If our conclusion that the collapse of industry is our only way out sustains itself through critique, then clearly this will require some changes in strategy. Still, innovation is not our focus right now and won't be for at least another year or two.

Our primary effort is building what we call the "tactical spectrum." The concept is best explained by a David Brower quote:

> *The Sierra Club made the Nature Conservancy look reasonable. I founded Friends of the Earth to make the Sierra Club look reasonable. Then I founded Earth Island Institute to make Friends of the Earth look reasonable. Earth First! now makes us look reasonable. We're still waiting for someone else to come along and make Earth First! look reasonable.*

In recent years, leftist swarm has successfully broken down this spectrum which used to unite radical and moderate efforts in the conservation and environmentalist movements. It is absolutely necessary that the spectrum be rebuilt and strengthened, because the time is indeed fast approaching for a movement that makes Earth First! seem reasonable. As discussed below, one of the primary ways to go about doing this is through tangible conservation projects.

D. The Role of the Ideology

Radical ideologies serve at least three functions that are relevant to us. First, they mobilize a small core of committed people, and are emphatically not for large-scale mobilization. They are important especially in asymmetric battles where the smaller side cannot rely too heavily, if at all, on the usual tools of

hierarchical organization, bureaucracy, and so on. Instead, ideologies provide a sense of unity and a basis for independent but coherent and directed action without the overhead of bureaucratic management.

Wildism exists, then, to motivate only a small party of people. It's not just that one can expect the party to be small; smallness is, in fact, desirable, since it allows quicker and more unified action. Thus, the party should not be afraid of factionalism per se. Minor disagreements should be no big deal, of course, but major disagreements that can't be resolved in a timely manner would be better ended with a split. Because of the importance of ideology in maintaining the strength of the small side in an asymmetric conflict, a primary goal of the party should be to preserve a loyal core even at the expense of greater numbers. This is the first function of the ideology.

The second function is to allow the core to speak about relevant issues exactly and efficiently.

A different and looser approach is required for broad-based action, but even in the context of specific actions or conservation projects, wildist cadres should strive to make the wildist narrative the dominant one, where appropriate. Speaking in technical language is in most of these circumstances unnecessary or even harmful, but it is important to answer the public's "Why?" with *wildist* answers that point out the tension between nature and industry, rather than, say, the social ecologist's pro-socialist answers. To put it another way, if you throw a pie at a Jewish CEO, it matters whether your reason was that he was a CEO or whether it was that he was Jewish. Thus, the third function of the ideology is ensuring that the cited reasons for an action are well-reasoned and true.

E. The Role of the Publication

The publication is the most important project of the party. It always serves more than one function, and because it is such a versatile tool, these often change with the shifting political landscape. Still, one consistent function it has is unifying the party with a single project that teaches members how they best work with each other and which keeps them consistently working on the stated cause.

The publication also provides a means to consolidate wildists. Whereas conservation projects and actions are usually geared toward the general public, the movement publication is for an internal audience. Public-facing publications should also exist, but are not the purpose of *Hunter/Gatherer*, at least at the moment. Most of the public-facing work should be done by cadres and individuals who read *Hunter/Gatherer* and can translate the ideas for the general public through projects, art, articles, speeches, etc.

The final function of the publication is, of course, to spread information and provide a forum for movement discussions.

F. The Role of Conservation Projects

Whereas the ideology and internal publication exist to consolidate and maintain networks, relationships, and infrastructure, more broad-based mobilization should be done through tangible conservation projects or specific actions with concrete goals. These sorts of projects allow a wider range of ideological opinions because, although a certain amount of unity is important, people mostly need to simply agree on the goal, no matter their stated reasons.

Given that the Institute's primary focus is laying intellectual foundations, for now we will mostly be focused on ideology and the publication. Other tangible work we do will not innovate on conservation strategy much at all, and will stick with the normal goals of protecting wildlands, connecting habitats, conserving species, and so forth.

At some point we hope to produce a general program that will consolidate many of the grassroots efforts we are and will be involved with. This will build on much of the great work already being done by organizations such as The Wildlands Network, Yellowstone to Yukon, and The Rewilding Institute. But we will also try to fill in the gaps in the programs, such as the conspicuous absence of any mention of ocean life.

We will also work to develop effective talking points for the public. Some issues are complex and difficult to deliver in soundbites, but with care the gist of the argument can be delivered quickly and eloquently. To give just one example, in arguing that industry is incompatible with nature and nature's wildness, we need not bring up arguments about technical and cultural evolution, we merely need to focus on technologies that function as "pressure points," such as roads, mines, genetic engineering, agriculture, and dams.

III. THE BIG QUESTIONS

In addition to outlining the basic ideas of wildism, a goal of the first volume of *Hunter/Gatherer* is to intensely scrutinize the hypothesis that industrial collapse is the only way out of our ecological problems, and even more intensely scrutinize the hypothesis that we must therefore aid the process of collapse. While most of us are fairly convinced of this conclusion, its repercussions are too far-reaching for us to run with it without carefully considering the alternatives first. This is especially true in the case of aiding collapse—which could mean a broad range of things, many of them not what we espouse at all. To this end, we are putting effort into answering the following questions:

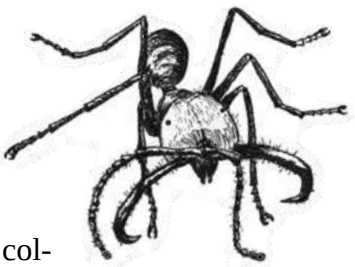
- Is there any viable alternative to the collapse of industry given our stated values?
- What are strong criticisms of the idea that collapse or aiding collapse is the solution to our ecological problems?
- What is the moral difference between collapse happening and helping collapse along, if any?
- How true are the Anthropocene booster's claims that technology can decrease human impact on nature?

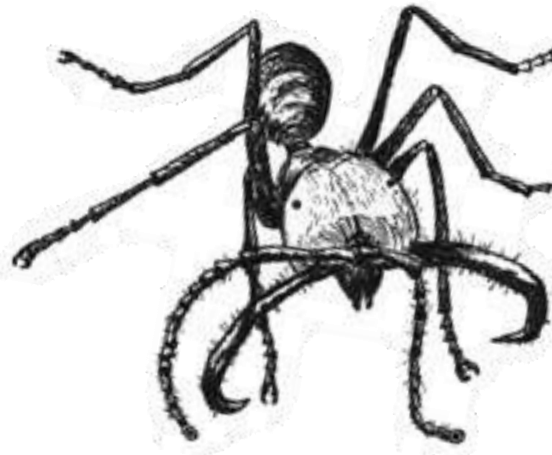
Individuals attempting to take on these questions will have to draw from a wide range of sources and fields, such as population ethics, the ethics of war, conservation science, and, in the case of the last question, technical and engineering sciences. This should consume at least a year of time, possibly more.

IV. CONCLUSION

The Institute is focused on issues that fall into three general categories: wildist ethics, scientific analysis, and conservation strategy. These roughly parallel the three components of our work, namely, our ideology, our publication, and our conservation projects and program. At the moment and into the near future, we will be focused on only the ethical and analytical components, working especially to ensure that we are correct when we say that the collapse of industry is our only way out, which could mean aiding collapse is a moral obligation. These immediate tasks should take at least a year or two.

This work is especially important in light of new revisionist ideologies and the left-wing takeover of environmentalism. It is important to reinvigorate the tactical spectrum that once strongly united radical and moderate conservationists, and to build a group that can maintain that spectrum and function as the conscience of the conservation movement, guarding its critique from the revisionism of the boosters, the watered-down critique of the cowards, and the anathema that is leftism, so that we might move far, far away from this industrial disaster and toward a wild earth.





The Foundations of Wildist Ethics

John Jacobi, *The Wildist Institute*

***Abstract*—Wildism is an ethical philosophy that stresses the importance of wildness in conserving and restoring nature. It could be considered part of the deep ecology movement, but was largely borne out of the perceived need for something more focused and well-suited to wildlands advocacy and other wildness-centered conservation work, especially in this age of revisionist conservation ideologies like the one of the Anthropocene boosters. This piece examines the foundational ideas of the resulting philosophy. The first part examines the epistemological and metaphysical principles undergirding wildism, while the second part outlines the ethical principles and ideas. Apart from the section on ethical discourse, the main ideas are as follows: (1) the Cosmos is a proper object of worship, as men such as Einstein and Carl Sagan have also asserted, and conservation work in this context can properly be conceived of as a sacred duty; (2) the dominant mythologies of progress are false, which includes social progressivism; (3) the conservation imperative must be extended to human nature; (4) industry is almost certainly incompatible with wild nature, leaving the collapse of industry as the only viable solution to our moral problems; (5) wildlands conservation is a foremost duty for wildists. In conclusion, the threats posed by revisionism are restated, as well as some necessary work for elaboration beyond this piece's foundational ideas.**

I. INTRODUCTION

WILDISM is an ethical philosophy that asserts that wildness matters enough to make civilized agriculture and industry morally condemnable. The ethical system could be considered a subset of the broader deep ecology tradition, and while I usually refer to it this way, I and the others involved in its creation have made no effort to live up to even the dearest tenets of the foremost deep ecology philosophers.

Indeed, wildism was borne out of frustration with the various weaknesses of the deep ecology philosophy. Predominant among these is the vagueness and amorphous nature of the philosophy as espoused by Naess, compounded by the conflicting and often self-contradictory versions later outlined by Sessions and especially Devall. As one critique put it, "deep ecology...is well on the way to becoming all things to all interested parties" (Sylvan, 1985). Admittedly, the only reason I cannot say that wildism is explicitly not a part of deep ecology is because of how broad Naess made it. Still, while I am suspicious of Naess' methodological vagueness and the implications it has for truth and honesty, his broad-based approach also provided some clear advantages. For example, because of deep ecology, there exists a definitive base for any radical ecological movement, which has definite strategic benefits.

Even so, a more specific and rigorous system is necessary at this time. Not only are ecological problems worsening and expected to continue to do so, the traditional conservationist focus on wildness is being attacked on all sides by various revisionist ideologies, from proponents of "sustainable development" to the Anthropocene boosters to the environmental justice faction that now defines the climate change movement. All of these, however, challenge the focus on wildness based on the same two ideas: that humans are benefitted by civilization even if non-human nature is not, and that reason, technology, and scientific planning can solve the problems caused by our current industrial civilization.

Thus, the time is now for the basic philosophy of the wilderness movement to be articulated with clarity and applied or extended to take on these two challenges. The first task—clarity—requires that the philosophy distinguish itself from deep ecology generally. The second is addressed throughout this text in the following manner.

Section II, "Consilience in Ethics," covers the metaphysical and epistemological foundations of wildism. I write about the scientific materialism on which wildism depends, argue for an ethical science, and explain how two such ethical sciences already exist, namely, medicine and conservation. Each of these roughly parallels its ideological counterpart, humanism and wildism, respectively. Although this section will likely be

boring or difficult for those not inclined to philosophize, I urge readers to pay attention to the outlined concepts, since I refer back to several of the ideas throughout the text.

Section III is the meat of the essay, covering all of wildism's core ethical principles. Subsections B ("Cosmos as Divinity"), E ("Anti-Industrial Reaction"), and F ("Wildlands Conservation") are rather short, the first two because they are still undeveloped and the last because most of the ethical work for it has already been done elsewhere. The idea of "Cosmos as Divinity" is likely to stay undeveloped for several years, but subsection E addresses what is currently the primary work of The Wildist Institute, as will be explained.

Subsection A covers the meaning of nature and various questions concerning its value, especially the significance of wildness in relation to it.

Subsection C outlines the heart and soul of wildism: the critique of progress. I define the myth of progress as the idea that human beings can artificially modify nature through reason or some pre-established blueprint to bring about a fundamental improvement in the world, especially the human condition. Most environmentalists have now recognized that this applies to non-human nature, but the prevailing refutation of progress is rather shallow, not taking into account that the critique must be more than an assertion that progress is not living up to some given set of values. Rather, much of the wildist critique of progress consists of empirical questions regarding limits to reason and the ability of humans to design a society. Note that because environmentalists tend to forget that the critique of progress applies to human nature as well, I focus especially on outlining why ideologies like left-wing social progressivism are in error.

Subsection D, "Conserving Human Nature," deals with the most controversial subject matter, and as such it is the most extensive section. Nevertheless, its argument to extend the conservation imperative to human nature is of central importance to this century's environmental battles, and with the critique of progress is one of the most important ideas of wildism.

Finally, I conclude the piece with a summary of wildism in plain language, some words on where the ideology needs to be developed, possible weaknesses with the presented ideas, and various issues to which they ought to be applied. In particular, I note the need for scientific work concerning the empirical questions raised about human nature and cultural evolution, as well as the issues raised by restorationist practices in conservation strategy of recent years.

In short, what follows is an attempt at detailing the ethical ideas that, sometimes unconsciously, drive the present wilderness movement or large portions of it. In the long run, we at The Wildist Institute hope these ideas will be utilized by individuals who wish to preserve the conscience of conservation, especially in this age of relentless revisionism, so that we might together pose a real challenge to the ongoing destruction of our wild earth.

II. CONSILIENCE IN ETHICS

"Consilience" is agreement between various fields of knowledge, such as between biology and physics. Commitment to the project of consilience, or the linking together of various fields of knowledge, also means being unsettled when two fields are in fundamental conflict with each other. The logic at play here rests on a belief that the universe is basically orderly and unified and that our knowledge of it must reflect this reality to the extent possible. Consilience is, in other words, a logical consequence of scientific materialism (henceforth simply "science"), a paradigm that is accepted well enough that I will not defend it here. We will instead take science as our starting point and the unity of it as our project.

A word on some of the problems with consilience. Even though scientific materialism would suggest that pure consilience is theoretically possible, the same paradigm denies the possibility that it is practically achievable, at least without modifying human nature substantially. Human biologies evolved not to ascertain truths about the world but to propagate genes, something that just so happens to be helped along by knowing a few things. But there are undoubtedly limits, not only to the amount of what we can know, but also to the amount of achievable unity between two areas of knowledge. It may be, for example, that the division between physics and biology is more a result of how our brains are structured than anything else.

Thus, I do not necessarily insist on any pure form of the theory. For now, it is enough to say that the project is almost certainly helpful when it comes to its three main battles: the divide between mind and brain, the divide between culture and biology, and the divide between ethics and science. It is the latter that I will focus on here.

A. The Is/Ought Problem

It is common to say that science and ethics have little or nothing to do with each other. "Facts," the thesis goes, "can tell us nothing about values." Almost invariably the name "Hume" follows, and with it comes that old and brilliant philosopher's argument that one cannot derive an "ought" from an "is." But even if we accepted the "is/ought" critique, it would not be enough to stop the project of an ethical science. If it was, all of science would be in trouble, not just ethical science.

Take, for example, Hume's other problem, the problem of induction. All of science and knowledge is at some point dependent on a piece of inductive logic like this one:

1. My knee hurts every time it hits the table.
2. I will hit my knee on the table tomorrow.
3. My knee will hurt tomorrow.

All other things being equal, we would intuit that this is true. But between 2 and 3 there is a sort of logical jump, called an "inductive inference," that is made inexplicably or that is made on the basis of an unstated premise that the world yesterday is like the world today and the world tomorrow will be just the same ("the principle of the uniformity of nature"). This is problem because the premise cannot be demonstrated except through induction.

In fact, Hume is famous for saying that we can know absolutely nothing for sure, and this position has come to be known as "radical skepticism." It is irrefutable. But people do not live out their day-to-day lives as radical skeptics—such a thing would nigh be impossible—and this critique, even if true and interesting, does not keep a scientist from doing his scientific work, nor should it. Although the divide between facts and values is a separate problem and may or may not be true, it has no greater ability to press the brakes on an ethical science than the problem of induction has to press the brakes on science itself.

B. Explaining Ethics with Biology

One aspect of consilience that is almost certainly true is the assertion that biology and related fields can *explain* ethics, at least better than religion and philosophy has. The basic argument rests again on simple logical consequences of reductionist materialism. If humans are fully material creatures then they are subject to the laws of evolution, and if there are no such thing as emergent phenomena inexplicable by lower-level phenomena, then moral precepts have to originate in material processes that are either biological or fully constrained by biology. To argue otherwise, one would have to challenge the fairly well-established premises, for example, by claiming that humans have a supernatural component.

The explanation is more than just a deduction, however. It also fits all of the epistemic values of science: it strives for accuracy, it is consistent with other disciplines, its implications expand beyond and are testable in scenarios other than one it hopes to explain, it is simpler than the alternatives, and it provides the basis for further investigation and research. That the materialist paradigm is still capable of producing such robust theories is a testament to its power and relevance.

Explaining the universal cultural presence of an incest taboo is one example of the theory's robustness. Haidt (2001) once ran an experiment in which he told his subjects about imaginary siblings named Julie and Mark. In the story, the imaginary characters decide to go on a vacation and decide to have sex with each other. Julie is on the pill, and Mark uses a condom. The brother and sister enjoy having sex but decide not to do it again, and they also agree not to tell anyone about it. After telling this story, Haidt asked the experimental subjects whether they thought what Mark and Julie did was okay. Most said it was not, but cited reasons like "the children could be deformed" or "they might have damaged their relationship," despite the fact that the story already addressed these concerns. After some questioning, many of the subjects simply said, "I don't really know why, it's just wrong."

There's also the "Westermarck hypothesis," which states that children raised together will probably not be sexually attracted to each other, even if they are unrelated. This was confirmed in a study of the Israeli kib-

butzim, wherein it was revealed that out of 2,769 marriages in second-generation kibbutzim, none were between two members of the same peer group, and no heterosexual activity between two members of the same peer group was discovered either (Shepher, 1971).

Finally, there's evidence gathered by the evolutionary psychologists. One of the most interesting is a study (Lieberman, Tooby, & Cosmides, 2003) in which participants ranked 19 social taboos in order from most to least offensive. Various kinds of incest ranked 5-10, below child molestation, rape, and spousal murder, but above assault with a weapon, robbing a bank, and various minor crimes.

Data such as these suggest that at least some of our moral precepts are shaped directly by biology. Other examples support the conclusion, like evolutionary explanations for altruism (Lieberman, Tooby, & Cosmides, 2007; Fehr & Fischbache, 2003). In fact, there is so much support for a biological basis of morality that I do not think it imprudent to say that the idea can properly assume the status of "fact." The implications of this are far-reaching.

C. The Implications of the Biological Explanation

1) Moral Relativism

One obvious implication of the biological explanation of morality is that it invalidates any "transcendentalist" conception that argues for an origin of morality outside of human biology. This includes religious insistence on the supernatural, but it also includes Kant's idea of the categorical imperative or those social scientists who would insist that cultural phenomena are only explainable in terms of other cultural phenomena.

In some ways, this is much less unsettling than affected parties would have it be. Some from the Judeo-Christian tradition, for example, find the idea that there is no soul to be a terrifying prospect, because, among other things, then there is no source for objective morals. But this is only terrifying to such a high degree when one believes one is losing something; and if the materialist explanation for morality is true, then the religious are not losing objective morality, they are only losing the mystified belief that they had it. Good thing too! Moral absolutism is almost always accompanied by blood and slaves. It seems a much better thing for man to be aware of his inadequate knowledge and to grapple with this inadequacy.

Wilson (1998) describes scientific fields as operating on different "levels." Mathematics and physics are at the bottom, molecular biology on top of them, evolutionary biology further up, and cultural anthropology further up still. The fields on the higher levels may not speak the language of those further down, but consilience *usually* entails that they operate on a stage set by the lower levels. If followed, this model would significantly decrease fragmentation in scientific endeavors. For example, an ethical science would be very high level, and striving for consilience would automatically knock off most ethical systems in existence today, like those that argue for a supernatural realm or a blank slate conception of human nature.

But it cannot reduce fragmentation completely. The project of consilience relies on at least a modest account of material realism (Sokal & Bricmont, 2004; Boyd R. , 2002) and it is on the basis of this account of ontological unity that epistemic unity rings true. But by the same account we have to realize that our knowledge of the "out there" is not *the same as* the "out there," and this limits the extent to which consilience can be achieved.

This is true even when it comes to the lowest levels of scientific inquiry. Individuals with neurological disorders would, of course, not have a disorder if we all suffered from the same condition. Their knowledge of reality would simply be the standard understanding. Note that I don't mean disorders like synesthesia. I refer more to the modules in our minds that establish the obviousness of some statement like "*A* can never be ~*A*." Of course this does not keep us from achieving something very close to unity in low level sciences, because, for clear evolutionary reasons, humans have standard hardware and software for dealing with the relevant questions of those disciplines.

The same cannot be said for moral values. I am unlikely to find a person who will deny the existence of a chair in front of me (except for maybe among postmodernists, who do indeed seem to have a different set of software from the rest of us). But humans are astoundingly diverse in their dispositions, characters, and moral judgements, and not all of that is because of ignorance or deception.

Consider psychopaths. They are an astoundingly persistent part of human social life, and make up a large proportion of living individuals (Babiak & Hare, 2006). They also have rather different moral compasses than most other humans, and there is no changing this without changing the person's biology. As one study put it, game theory predicts that human populations evolve to a "stable equilibrium with a fixed proportion of individuals habitually behaving antisocially, and with suitable payoffs the proportion of antisocial individuals corresponds to the known prevalence of [the disorder]" (Colman & Wilson, 1997).

Related is the idea of "moral ecology," or the idea that stable human populations will tend towards some degree of moral diversity, which, among other things, allows for more robust responses to the environment (Dean, 2012). If the idea of moral ecology proves true, then incommensurability of ethical first principles is built-in to the very "design" of human evolution.

Thus, while I am unlikely to find an individual who denies the existence of a chair in front of me, the evidence just given indicates that the obviousness of that chair's existence will parallel the obviousness of individual moral beliefs only to some groups of humans. As a result, the discipline of ethical science is likely to have several competing fields, say, a humanist ethical science and a wildist ethical science; and overcoming this is, at least for now, a logical impossibility, because the logical playing field begins differently for everyone. (Some, like Harris S., 2012, argue that a universal morality *is* possible because of our reasoning abilities. I address this later.)

2) Free Will and Responsibility

There is also some unrest over the implications materialist theory has for the concept of free will. But this, too, is unfounded. The idea, for example, that free will means freedom from any influence whatsoever is incoherent. Even if human decisions had a spiritual source, the source would presumably still be subject to similar kinds of cause and effect relationships between things in the spiritual realm. So the question is not whether human decisions are free from the influence of anything but whether they are free from the influence of some specific class of things. To many of the religious, this specific class of things consists of the material world. They would either have it that human decision-making is an entirely non-material process or that it is at least partially so. But the supernatural does not exist, so we can dispose of this idea.

After we reject the supernatural, the real debate about free will is primarily concerned with what conditions qualify as "free." Some jump the gun and insist that free will simply doesn't exist. These individuals are right to argue that what they call "free will" doesn't exist. For example, one study found that the brain makes a decision several seconds before its human being is consciously aware that he has made it (Soon, Brass, Heinz, & Haynes, 2008). Thus, any notion of free will must accommodate aspects of our material reality such as this.

Others espouse a spectrum of positions known as "compatibilism," and they claim that "freedom" does not have to be metaphysical. For example, we could say that a person has free will when he is not coerced by another human being, or, sometimes, even external but rare factors like temporary, induced mania. Ultimately the argument is a semantic one, so we would do well to avoid debates framed with the question, "Does free will exist?" It is enough to say that the thing being described by the compatibilists is philosophically significant, whatever one wishes to call it.

In some ways this might seem like cheating, but the compatibilist notion (or at least this version of it) fits the primary function of free will fairly well, that function being a way to determine whether or not a person should be punished (or rewarded). That is, a person should be punished if he acts in a negative way that he can be expected to act in again. Or, the reverse, a person should not be punished if he acts in a negative way that he cannot be expected to act in again, and this is possible in cases listed by the compatibilist notion, namely, coercion by another person or through some temporary non-human force. Once these forces are no longer exerting their power, the individual might not ever think about engaging in the same behavior again.

Of course, this does not always determine whether or not the individual should be punished or killed or jailed. If a man walks into a public area and reveals that he has a bomb that he will detonate, the police are surely justified in shooting the man first, no matter who or what coerced him to do so. Furthermore, even

in cases where a person acts from some irregular coercive force, it may be necessary to punish him for the sake of social stability, to deter others from engaging in the same behavior.

These exceptions indicate that perhaps compatibilists, although not incorrect, provide a framework that is not quite as illuminating as alternatives could be. Consider again the fact that the brain makes decisions before we are consciously aware of them. According to the notion above, we have free will because the brain is ours, so decisions that the brain makes are ours. But does this apply to our microbes? It seems that the most illuminating position may yet be disposing of the free will idea entirely. Nevertheless, wildist discourse at the moment uses a compatibilist notion of freedom, useful especially in the context of the great "unlinking," a notion that should become clearer further on.

Why, then, must we feel motivated to do anything? One major reason is that we don't really have a choice but to feel motivated, else we would find ourselves falling into depression with its severest symptoms. This happened to me when I was younger and discovered that my Christian God did not exist. Another reason is evidence indicating that when people discard of the concept of free will, they begin acting in odd and potentially negative ways (Shariff & Vohs, 2014). This indicates an interesting dynamic that Daleiden (1998, p. 78) calls the *Responsibility Paradox*: "Although humans are totally determined by biological and environmental conditioning and, hence, are not truly responsible for their behavior, society must treat persons as morally responsible to ensure that the consequences of those person's actions provide the necessary motivation to generate prosocial behavior."

I would word it differently than Daleiden, but he is essentially correct. Not only are we effects of causes, we are causes of other effects; thus, in the context of a unit like a social group, norms created by its members can provide an incentive that feeds back to help determine the same member's behavior, as well as the behavior of future generations. A major difference between wildists and humanists, however, is what counts as a legitimate reference group. Humanists and others in industrial society would advocate large-scale solidarity, to the point of encompassing all humans or even some animals. Wildists, instead, stress the importance of *relations*, something explained in section III.D.4, "Man and His Relations."

Still, to create social norms is also a determined action, and this returns us to the same problem of determinism that has nagged philosophers for years. I have some hypotheses for how to deal with this problem, related to the brief section, "Cosmos as Divinity." For now, however, this important but tangential topic must be set aside for a later time. What has been covered is enough for the purposes of this text.

3) Biological Limits to Knowledge

I mentioned earlier that pure consilience is likely impossible, at least so long as we are constrained by our biologies, because our ability to know things about the world exists only for that ability's value to evolutionary fitness, or because it is a byproduct of some other ability that has fitness value. For example, there is absolutely no direct evolutionary reason why humans should be able to understand subatomic particles, so clearly we have that ability only because the same structures that allow humans to understand those particles happened to grant some evolutionary advantage in the ancestral Pleistocene environment. In other words, we know that what we can know has definite limits, and this includes our moral knowledge. For sure, we can "transcend" these limits with reasoning to some degree. But reason has limits as well.

Some examples are simple, such as the fact that we aren't privy to some sensory information that other animals are privy to. Migratory birds, for example, sense the Earth's magnetic field (this is how they know where to migrate) and sometimes even have a type of synesthesia that allows them to *see* it (Beason, 2005). And at least some sharks have the ability to sense electric fields (Kalmijn, 1971). Humans, of course, do not have these abilities.

But the problems get more difficult. The psychologist Daniel Kahneman illustrated a series of such problems in his excellent book, *Thinking, Fast and Slow*. One example he gives recalls an experiment in which he and the psychologist Amos Tversky told participants about an imaginary character named Linda. Linda, the story went, was single, smart, and outspoken on the issues of discrimination and social justice. After explaining this, the two psychologists asked

if it was more probable for Linda to be a bank teller or for Linda to be a bank teller who was active in the feminist movement. Of course, basic lessons in statistical probability would reveal that the first answer is the correct one. Only a subset of all bank tellers are feminist bank tellers, so adding the extra detail will necessarily decrease the probability. But most participants said the second answer was correct.

Another phenomenon Kahneman reports is called the "availability heuristic," which means that the easier something comes to mind, the more probable the human mind will judge it to be. For example, Kahneman and Tversky (1973) asked participants in one experiment to judge whether words that began with the letter *k* were more probable, or whether words with *k* as their third letter were more probable. Because we recall words by their onsets, words beginning with the letter *k* are easier to recall. Thus, the duo predicted, rightly, that participants would judge words beginning with *k* as more likely, even though the opposite is true. One could repeat this experiment using almost any letter.

The availability heuristic helps explain why people seem to fear things in a way that is totally incongruent with statistical probabilities. For example, death by falling furniture is much more likely than death by murder, but because it is easier to recall instances of murder, perhaps from the news or even novels, people fear it significantly more. This may explain why individuals in nations with extremely low crime rates but oversaturated with news media suffer from undull anxiety about crime.

The heuristic also has implications for moral reasoning. In his book, Kahneman describes two kinds of systems in the human brain. System 1 is intuitive, fast thinking, and it utilizes various shortcuts in order to come to conclusions. For all its imperfections, System 1 can be surprisingly accurate, especially when making decisions closer to the kinds our Stone Age counterparts would have made. In contrast, System 2 is analytical, slow thinking, the part of the mind that humans use to write or do complicated math.

Kahneman argues that the fast, intuitive system is more influential and that individuals often act on its conclusions without the analytical mind ever even knowing about it. But just imagine what this means for humans making split-second moral decisions with big consequences, like dropping a bomb or initiating a drone strike. Or even just imagine what this means for humans who run large and ostensibly benign systems that might also require split-second decision-making, like nuclear facilities.

Finally, there are the most unsettling biological limitations of all, which also happen to be the ones that brush up against the topic of morality most directly. One of the most striking of these is our inability to reason about moral obligations to large populations. For example, Slovic (2007) once conducted an experiment in which he told volunteers about a starving girl, measured their willingness to donate, and then told the same story to another group but with the added detail that millions of others were also starving. The second group gave around half as much money as the first. In fact, Slovic found that even adding just one more person would begin the process of "psychic numbing."

Slovic's finding that humans have a hard time reasoning about large numbers of people is in some ways unsurprising. In fact, it is a hallmark problem of population ethics. Churchland (2011, p. 178) put it this way: "no one has the slightest idea how to compare the mild headache of five million against the broken legs of two, or the needs of one's own two children against the needs of a hundred unrelated brain-damaged children in Serbia."

The evolutionary explanation for this is that humans have never had to deal with such large numbers of people, so conditions didn't encourage the evolution of mental mechanisms that would allow us to do so intuitively. It may be that we can use Kahneman's analytical System 2 to conquer the problem, but it may also be that our analytical mind isn't equipped to deal with it at all. Whichever happens to be correct, the problem stands as one of the more important ones of our age.

4) Summary

The biological explanation for morality (and the mind) is compelling and likely true, but it comes with far-reaching consequences for our understanding of how capable humans are at moral reasoning. Coupled with moral relativism, also an implication of the biological explanation, these consequences are unsettling. It seems that humans are fated to doing the best they

can without any real guarantee that they are right, or even a guarantee that they will eventually know they are right, and all the while their best has to rub up against very real, sometimes insurmountable limitations and imperfections of the mind. Acknowledging and grappling with this reality is a necessary part of the program of any twenty-first century ethics—especially one that hopes to address such consequential problems as climate change, genetic engineering, and the sixth mass extinction.

D. From Scientific Explanation to Ethical Science

1) Importance of First Principles

Consilience in ethics means more than just explaining ethics scientifically. It is also possible to devise an ethics that is itself a science. Earlier I mentioned that Hume's "is/ought" problem has as much power as the problem of induction to stop such an endeavor, which is to say, it has no power at all. But of course, someone who really didn't like the idea of an ethical science could always bring up one of the other myriad of issues that the project poses. Unlucky for him, none really get more powerful.

Consider, for example, the criticism that an ethical science would betray the scientific spirit of not assuming anything, simply going out into the world to discover and *then* explain. While this is a popular criticism, it's not substantive, because that's not how science works at all. Any short introduction to the philosophy of science will include concepts like "the problem of induction," "underdetermination," and "paradigms," and near the end of the survey of the problems, the big reveal will be that all of science relies on first principles.

Imre Lakatos (1978) offered the metaphor of a core surrounded by a protective belt. The core consists of theories that are absolutely essential to what he called a scientific research program (which is basically the same as the more common "paradigm"). A change in the core would mean the end of the research program, or at least its transformation into something rather different. But around the core is a "protective belt" of theories that can be changed, and may be changed without any real reference to evidence if it means preserving the core. Of course, if that happens too much, then the research program stops producing new explanations and successful predictions, which Lakatos calls a "degenerate" state. At that point the program is susceptible to being replaced by a new and better one with a different core.

Some scientists have adopted Lakatos' theory rather explicitly. The anthropologist Marvin Harris (2001, pp. 3-76) begins his research program of cultural materialism with assumptions about epistemology, a "universal structure of society," and the idea that a culture's material productive factors have the strongest influence on its character. In other words, it is expected that a person who ascribes to cultural materialism will *assume* these things when looking at a set of evidence. Consider also the way this plays or played out in evolutionary theory, Newtonian physics, and even mathematics (which calls its first principles "axioms").

An ethical science, then, will have to jump over expected logical hurdles and decide on first principles, and in this way it will be no different from non-ethical science. From what I can tell, this includes mostly questions of value—what to value, how much value, what to do in the case of competing values—but also includes whether to evaluate behavior based on consequentialism, deontology, or virtue ethics. Again, these problems are not much different from problems in mathematical logic and the philosophy of science.

2) Examples of Ethical Sciences

A field of ethical science that has decided on its first principles would probably look something like medical science. In fact, if we are to define "morality" as "the rules that govern behavior," then medicine, a field founded on the scientifically unprovable value of "health," could easily be called an ethical science. Practitioners often take up the questions outlined above by debating them at conferences and in journals, and the answers produce obligations for those who value health in themselves and others. The reason, perhaps, that all this is not considered ethics is that concern for health is, for good evolutionary reason, mostly universal. (Although "health" is ambiguous enough for this not to be true for all of medicine, particularly when its normative postulates are broadened by humanists.)

Another example would be conservation science, a discipline that is often compared to medicine but is

much more explicitly identified as ethical in its concern. This is seen clearly in Michael Soulé's seminal article, "What is conservation biology?" One section heading is even entitled "normative postulates," which Soulé introduces with an interesting paragraph:

> *The normative postulates are value statements that make up the basis of an ethic of appropriate attitudes toward other forms of life—an ecosophy… They provide standards by which our actions can be measured. They are shared, I believe, by most conservationists and many biologists, although ideological purity is not my reason for proposing them.*

Soulé goes on to outline the normative postulates as seeing value in biodiversity, ecological complexity, and evolution. As he does, one can detect the obvious influence of deep ecology.

This indicates that conservation biology is the field of ethical science relevant to wildists, much in the way medicine would be a relevant field for humanists, with their concern for "human well-being." In both cases, the primary task would be bringing to light the values that undergird the work of significant populations of practitioners in the fields. In the case of medicine, the humanist would point out that health is simply a subset of the larger ethical concern for "human well-being," at least to many or most of the practitioners. (See, for example, Cohen, 1950, and "humanistic medicine.") In the case of conservation, the wildist would point out that biodiversity is, at least to many or most conservationists, a subset of the larger ethical concern for wildness.

One can see a battle between the two ethical sciences playing out most clearly on the topic of biotechnology. Medical science holds some of the strongest arguments for biotechnology because it presents itself as the most promising solution to anti-biotic resistance, various until-now incurable diseases, and other problems that have to do with health and human well-being. It is on the basis of these that biotechnology will be argued for. One biologist said to me, while discussing my views on the topic, "Not to try to eradicate [pain and sickness] is, in my mind, unconscionable." And a medical practitioner, after a similar conversation, brought up the success of industrial technologies at "quelling death by infection all over the globe." Both of these echo the statement by Professor Julian Savulescu, the editor of the *Journal of Medical Ethics*, who stated that genetically engineering human babies was a "moral obligation" (Alleyne, 2012).

These perspectives of course have logical difficulties, but are generally on solid ground *given their central value*, namely, the well-being of humans (and sometimes the broader "sentient beings"). The conservationist perspective, however, which sees value first in the autonomy of nature and thus the smallness of man, will necessarily clash with biotechnology and even industrial medicine. To a serious conservationist willing to state his views frankly, this includes cases where these technologies benefit or ostensibly benefit humans. For if one of the central theses of the conservationist project is that man is not unique in the way the humanist claims, then the conservation imperative applies to human nature just as well as non-human nature. This is indeed one of the implicit ideas underlying much conservation work, and something that this systematization of wildist thought makes explicit.

3) The Necessity of Ethical Science

Because the first principles of the ethical sciences are incommensurable, to a much greater degree than Kuhn (1962) would have even lower-level sciences be, the coming century's battles cannot only be about ideas; they instead *must* entail practical efforts as well, and therefore will have great consequences. This alone is reason enough to support the development of an ethical science, for a developed field, if truly scientific, would provide mechanisms to stave off those who would obscure and mystify moral truths for the sake of power, something that is especially important to guard against when the negative repercussions could be so great.

Furthermore, many of the great ethical issues facing us do not come intuitively and cannot allow so wide a margin of error as would be permissible under circumstances with lesser consequence. This indeed is the whole reason that the institutions of science have succeeded so thoroughly. Whereas our primitive counterparts possessed the capability to reason and did so frequently (Liebenberg, 1999), newer material conditions that required more precision of thought and had more

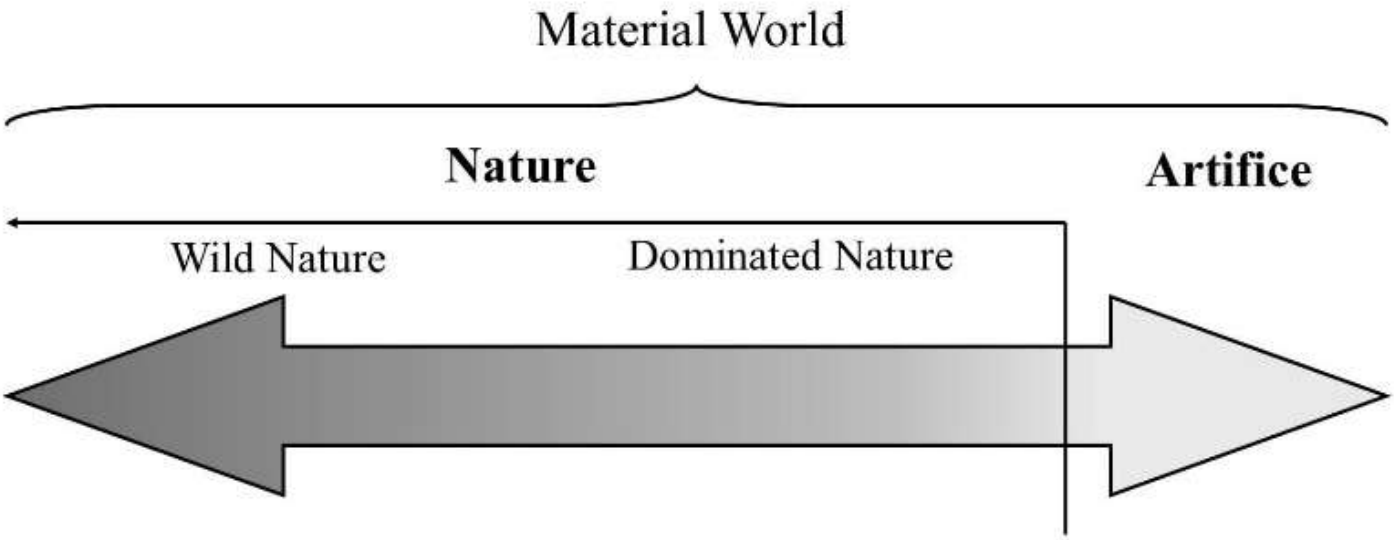


Figure 1. Diagram illustrating the spectrum from natural to artificial in the context of the Cosmos / material world.

extensive impacts in case of miscalculation needed technical methods to offset human biases and error. Thus, in light of, say, Slovic's (2007) findings on human moral reasoning, an ethical science that hopes to address such questions as overpopulation must regard as indispensable a culture that places value on critique, counter-critique, and truth. This would thankfully allow much of the trial and error process that reveals moral truths to occur in the cognitive realm, so that those actions that are taken in the real world do not unnecessarily become painful and guilty memories.

III. THE ETHICAL PRINCIPLES OF WILDISM

A. The Value of Nature

The primary assertion of wildism is that nature has non-instrumental, non-derivative value, sometimes called "intrinsic" value (O'Neil, 1992). This belief in the non-instrumental value of nature compels wildists to be fundamentally concerned with increasing and respecting nature's autonomy, which, put differently, is at its core a contention about human control and domination, an assertion that humans simply shouldn't have as much control as they do. At the least, this applies to human control in the context of intensive agriculture and later, something I explain more fully below.

1) The Meaning of Wild Nature

The word "nature" is an ambiguous one, but here I use it to mean "the world not made or controlled by humans or their technical systems." This is in contrast to "artificial," which is just the opposite. Note that the distinction between "natural" and "artificial" is descriptive, akin to the distinction between Jew and Gentile. Both are a part of the material world, so saying that something is made by humans and is therefore not natural does not mean this thing is somehow less subject to physical laws and processes. It is not, that is, the old doctrine of human separateness.

The confusion in this regard stems from another meaning of "nature" that equates it with "the material world." This usage is still popular in the lower-level sciences like physics, and this is primarily because of the convenience of the term in contrasting science's domain with that which is called "supernatural." This meaning of "nature" is the one scientists (and some conservationists) use when they state that "humans are a part of nature," usually to make clear that humans are a product of evolution like every other living thing. It is also the meaning used by the obscurantists who would counter conservationist critique with the statement "Everything is natural."

Of course, it is true that "Everything is natural," given that "natural" means "the material world." But

this is not the kind of nature that the conservationist is concerned with. The current mass extinction is a material process just as much as the past mass extinctions were. The point is that this one is artificial, human-caused, and because of this it is morally relevant in a way that no other mass extinction has been. The same applies to climate change, deforestation, and most other issues associated with conservation or environmentalism.

Thus, to quell the confusion, I will separate the meanings by using a terminology that should already be clear: "the material world" refers to all that exists, and "nature" refers to the part of the material world that is not made or controlled by humans or human technics (see Figure 1). This is common in environmental ethics and conservation (Hunter, 1996; Vining, Merrick, & Price, 2008; Schroeder, 2005; Angermeier, 2000; Hettinger, 2002).

It is important to note that situating humans within the material world is an indispensable part of the conservationist critique. Being concerned with the value of the world not made or controlled by humans seems to occur only once belief in the supernatural and the doctrine of human separateness dies (White L. , 1967), which might explain why nature has become a primary source of spiritual experiences for secular nations (Taylor, 2004). But this insight is the extent of many people's environmentalism. These people are concerned mostly with teaching the importance of the scientific view that the fate of humans is tied to the fate of ecosystems, and thus their primary concern is ensuring that environmental degradation does not impact "human well-being." Most of the time when this insight exists by itself, the result is "bright green" environmentalism, or what Naess (1973) called "shallow" environmentalism. It is a quite different brand of environmentalism than what I will outline here.

As for the "wild" in "wild nature": it is synonymous with "autonomy" in the phrase "autonomy of nature." When I say nature is "autonomous," I mean, following Katz (Heyd, 2013, pp. 77-85), that it is not dominated by humans or human technics. There is no need to complicate this definition by debating whether "autonomy" entails some sort of self-propulsion or dynamic movement. Such discussions are bound to be overly heady and unhelpful. The important point is that the lack of human domination is what we strive for. Thus, rocks, for example, can be autonomous. To demonstrate the relevance of this conception of "autonomy," Katz notes the debate over whether rock climbers should be able to use metal bolts for climbing, and whether or not they should be allowed to leave the bolts for other climbers (p. 83). Given our stated concerns, we should clearly lean towards "no," especially considering the ongoing and rapid loss of the few remaining wildlands.

Note that wildness is an aspect of naturalness. Fully natural objects are also fully wild. The wildist concern, then, is in some sense increasing the naturalness of the world, but this does not communicate the values precisely enough. Those who are in fact concerned primarily with preserving biodiversity may just as well demand an increase in what they call naturalness (Ridder, 2007). A more precise discourse speaks of concern for nature's autonomy, or the wildness of nature. To illustrate, caging a wild animal would not immediately decrease the animal's naturalness except insofar as it decreases its wildness. Yet it is precisely this decrease in wildness that permits and begins any drastic decrease in naturalness, such as, in the case of an animal, the process of domestication. Similarly, the release of human control is the first step toward increasing the naturalness of the world, such as with domesticated animals that have gone feral or a river ecosystem that is freed from the control of a dam upstream.

Finally, naturalness (of which, to repeat, wildness is a part) should be conceptualized as an end on a spectrum with artifice rather than being dichotomous with it (see Figure 1). Thus, one might speak of a wilderness area as having a high degree of wildness but a city as having a low degree of wildness. In between, one might place an abandoned building. Although this involves some level of ambiguity, those involved in conservation science have found ingenious and reliable methods for measuring naturalness or, conversely, human influence (Anderson, 1991; Machado, 2004; Theobald, 2010). Those who look on such measurements with skepticism must keep in mind that a similar use of science is important for clarifying many kinds of ethical systems. For example, the humanist who places value on sentient beings will have to expand his scope of moral consideration to at least some animals

as scientific inquiry reveals more about the ability of these animals to suffer or flourish. In a similar way, reasoned assessment of empirical evidence can aid us in discerning at least general degrees of naturalness and artificiality in an ecosystem or organism, with the extremities of the spectrum being the most obvious. And while uncertainties are an indication that we should tread lightly in applying our values, uncertainty alone does not invalidate an ethical system.

2) Values and Valuers

To say that nature has non-instrumental, non-derivative value is not to say that the value exists independently of a valuer. Some ethical philosophers (e.g., Holmes Rolston) have certainly argued this, but is not a necessary component of the kind of intrinsic value that is relevant here. It is enough to say that "nature has intrinsic value when it is valued (verb transitive) for its own sake, as an end itself" (Callicott, 1995).

Combined with moral relativism, this concept of intrinsic value might lead some to believe that we are impotent to act, but all it really does is make clear that appeals to nature's intrinsic value are impotent among those who do not accept it. This allows those of us who do accept it to more appropriately direct our efforts to practical work. In truth, this applies even if moral value existed independently of a valuer, since there is nothing about an independent value that would enforce it to be respected.

The non-objectivity of nature's value also does not preclude radical action. For instance, many people have died in the name of national self-determination or democratic freedom, but no one ever requires that these individuals demonstrate the objective existence of the value of liberty in order to justify their struggle.

3) Increasing Value

Value can also increase. Some, known as the "Anthropocene boosters," argue that because naturalness has been so diminished, we humans should simply accept our place as Earth's gardeners. But it makes much more sense to argue, as I and others do, that as naturalness becomes rarer, its value should increase (Wuerthner, Crist, & Butler, 2014, pp. 174-179; Noss, 1995).

Among the individuals at The Wildist Institute, there is a popular phrase: "Live wild or die." It is true that so radical a statement may not be appropriate at all times or in all places. Indeed, maybe in other times and other places a fight to the death would be too costly a price in the face of only slight and temporary violations of wildness. But the assault on nature has been too long and too thorough for this to be the case any longer. In the face of widespread human and technical domination, the mantra "Live wild or die!" is the only response capable of reclaiming our and nature's autonomy—*especially* if the Anthropocene boosters are correct.

4) The Autonomy of Nature

To value nature non-instrumentally includes all the things that the term "nature" entails, such as biodiversity or ecological integrity. However, to value nature non-instrumentally also necessarily produces an obligation to respect nature's autonomy, much in the same way that non-instrumentally valuing a human being entails respecting his autonomy. For one discussion of this idea, see Heyd (2013).

Thus, the autonomy of nature, or "wildness," functions as a core value that anchors other aspects of naturalness. To offer an example, conservationists often speak of or biodiversity, but as Hettinger & Throop (1999) point out, biodiversity is only valued within the context of wildness. Otherwise, conservationists would have no issue with artificial attempts to force greater biodiversity, such as through introduced species, as one Anthropocene booster suggested (Thomas, 2013). But many conservationists clearly do take issue with those approaches.

Finally, as Fox (1993) explains, valuing nature non-instrumentally does not mean that its autonomy is "inviolable." "Even in the human case," Fox writes,

> *we readily accept that it is justifiable to harm—even kill—another person if, for example, we are acting in self-defence. Thus, the question of whether it is wrong to harm or interfere with entities that are intrinsically valuable actually turns on the question of whether we have sufficient justification for our actions.*

The actual work of determining what qualifies as "sufficient justification" is the domain of conservation science, and will not always yield to easy answers.

To make a final point, related to the one above, respecting nature's autonomy does not mean demanding

that nature be "untouched" by man. Howard Zahniser got it right in The Wilderness Act when he wrote of the need for places "*untrammeled* by man," using an old, uncommon word that means "not deprived of freedom of action or expression; not restricted or hampered." The problem, then, is not with human influence; it is with human domination (see Hettinger, 2002).

5) How Much Value?

In moving from the question of whether there is value in nature and onto the question of how much value, "benchmarks," a concept from conservation science, help wildists further specify their ethical claims. Common benchmarks include the transition to agriculture and civilization, European colonization, the onset of the Industrial Revolution, and the first use of nuclear bombs. Though imperfect, not all of these benchmarks are arbitrary. For example, that the transition to agriculture fundamentally transformed human-nature interactions is undeniable.

Still, the concept has two mutually exclusive uses. On the one hand, those who are concerned primarily with biodiversity often use historical benchmarks to determine what is natural. For example, an idea in classical conservation work considered the state of ecosystems prior to European colonization as the natural state that conservationists should attempt to preserve (Angermeier, 2000). However, this is an incoherent use of benchmarks for the ethic of wildness. Although influential, the idea of ecosystem stability is not consistently true or applicable (Hettinger & Throop, 1999). Consequently, restoring levels of wildness does not necessarily restore ecosystems to a "stable state" that can be seen in some previous historical period (Landres, Brunson, Merigliano, Sydoriak, & Morton, 2000; Sydoriak, Allen, & Jacobs, 2000).

We might therefore use benchmarks not as points on a historical timeline, but as rough measures of potential human impact. For example, instead of proposing the Pleistocene as a benchmark, a more accurate benchmark of influence would be the nomadic hunter-gatherer mode of production. Of course, nomadic hunter-gatherer societies can vary widely in their influence, but since societies cannot extend beyond the influence permitted by their infrastructural determinants without transforming those determinants, modes of production enforce a more or less consistent limit on human control.

This is not to say that historical time periods aren't useful. To the contrary, the science of ecosystem stability is consistent enough for historical time periods to function as rough indicators of what ecosystems might look like should some level of wildness be restored. As Angermeier (2000) writes, though "ecosystems are too poorly understood to allow precise measurement of all human effects," they do "have functional and evolutionary limits and natural ranges of variation, which provide a basis for [an] objective assessment…" Nevertheless, these limits have changed through geologic history, and human effects such as climate change and extreme rates of extinction signal that the limits may again be shifting permanently (Zalasiewicz, et al., 2008).

Most conservationists argue against industrial practices and many other environmentalists do as well. This is easily justified, since technologies as basic to industry as roads (Noss, 2015; Trombulak & Frissell, 2000) and dams (Ligon, Dietrich, & Trush, 1995) have devastating effects on wild nature, some of them the main causes of the worst environmental problems of the day. In fact, even the Anthropocene boosters argue for keeping industrial technology on the grounds that innovation or better practices could reduce industry's impact. (Kareiva, Marvier, & Lalasz, 2012).

Conservationists are also commonly against civilized agricultural practices. By this I mean agriculture that sustains cities, very often through imports, large-scale habitat destruction, and human enslavement, and, in the industrial age, through technical intensification that is especially harmful to wildlife and over a greater area (McLaughlin & Mineau, 1995; Lemly, Kingsford, & Thompson, 2000). With rural agriculture, however, it is hard to find as heated opposition. No doubt some of this has to do with relevance—current agricultural practices are almost always intensified with industrial technology—but in some cases wildness-centered conservationists explicitly state that rural agriculture could be morally permissible (Heyd, 2013, pp. 86-98, 99-118).

Following these views, the core idea of wildism can be stated thusly: wild nature matters such that produc-

tion at least at the level of industry and civilized agriculture is morally unjustifiable. This "level of value" could be a result of a convergence between wildism and some other ethical philosophy, or it could solely stem from the amount of value nature has, regardless of other values. However, as the domination of wild nature becomes ever more severe, even caring for it a little should be sufficient justification for the benchmarks, because, as stated above, value can increase.

To give an intentionally drastic example: Imagine that industrial degradation of nature carries on so that by the second half of the century there is only one true wilderness area left on earth, about the size of Yosemite. Clearly, among those who value wild nature, this area would be very valuable and even extreme efforts to protect it would be justified. But if we also imagine that the continued existence of industry would inevitably result in the destruction of this wilderness area, any protection would necessarily entail the end of industry. Since in this imagined scenario industrial production has spanned the entire globe, the end of industry would practically mean more than just that. Instead, for many if not most areas, a lack of industry would allow at most extremely small-scale cultivation on the part of its human inhabitants. Thus, valuing nature and nature's autonomy would in this scenario require a benchmark of production before civilized agriculture.

Still, it is not important that all wildists agree that the benchmark is justifiable on the grounds of nature's value alone; the important part is simply that they agree. This is mostly for practical reasons. A person can say he values nature but then insist that it matters only so much that *further* industrial destruction is unjustifiable. But clearly this would not be what even most environmentalists believe. Thus, while there can be more or less radical elements within the bounds set by the given benchmarks, they are narrow enough to entail a politically discrete population of conservationists and not so broad as to be meaningless.

Note that the foregoing is only about wildist moral values, not their practical application. Just as someone might argue that all murder is wrong while also recognizing his inability to prevent all murder, a wildist, along with most other environmentalists, can recognize that civilized agriculture and industry are morally unjustifiable while simultaneously recognizing practical limits.

6) Other Values

Clearly, *wild*ism is concerned with wildness. However, the central assertion is that *nature* has intrinsic value because naturalness includes more than wildness, and subsidiary values like biodiversity, ecological integrity, and so forth matter as well. These values interact in complex ways, and discerning the ways in which they do is the practical work of conservation science, especially since interactions are bound to be contextual. Thus, Hettinger and Throop (1999) put it best when they wrote:

> *...we are not suggesting that wildness is always an overriding value or that highly wild ecosystems are always more valuable than less wild places. ...For example, to protect biodiversity, we might put out a fluke lightening-lit fire in order to protect the biodiversity of an island packed with endemic plants. Moreover, a somewhat wilder, but much less biodiverse landscape (e.g., Antarctica) is not necessarily of greater intrinsic value than a somewhat less wild, but much more biodiverse landscape (e.g., the Amazon rain forest). A full theory of wildness value would include some priority principles indicating when wildness value will trump other goods. We cannot provide such thorough guidance here, though we do suggest that as the planet becomes more humanized, wildness value will increasingly trump other values.*

The problem they mention in the latter half of the quote is essentially the problem of restoration. For example, we might be able to argue that preserving a biodiverse ecosystem through active management is necessary for a time, as Noss (1995) has argued, but the perpetual question is always how long such active management is appropriate. How far ahead must a "later time" be for the compromise to cease being acceptable? This is no easy question, and remains a pressing one.

There is also the question of how biodiversity in particular interacts with wildness. This debate is longstanding (Noss, 1996; Hettinger & Throop, 1999;

Ridder, 2007), but the first principle of wildism is clear regarding this point. Although there are ambiguities in restoration practice, both conservation and restoration should be done with the end goal of restoring nature's autonomy. Thus, efforts to conserve biodiversity for economic, technical, and scientific use should always be subordinate to the ultimate goal of respecting nature's autonomy and discarded when these goals are incompatible. This is an immutable point because it is a moral one. Its importance should become clearer in section III.D.9.

B. The Cosmos as Divinity

Once the supernatural is abolished with the razor of scientific thinking, one necessarily realizes that the rest of the material world has been neglected in the name of fantasies, and that we must begin to discern our moral obligations toward it. Thus, we find after the death of God another infinite, omnipotent "Creator," the Cosmos, and in our efforts to discover the moral boundaries between our work and Its, the artificial and the natural, we might find a certain usefulness in traditionally religious concepts, like ritual, sacredness, and the Sublime.

Note that even the New Atheists, who have applied the razor of science to the superfluous power-hungry aspects of religion, have found such concepts to be implacable. Dawkins (2005) writes, "My objection to supernatural beliefs is precisely that they miserably fail to do justice to the sublime grandeur of the real world. They represent a narrowing-down from reality, an impoverishment of what the real world has to offer." And Hitchens: "If we could find a way of enforcing the distinction between the numinous and the superstitious, we would be doing something culturally quite important" (Dawkins, Dennett, Hitchens, & Harris, 2012).

A general vision for the "distinction between the numinous and the superstitious" has been outlined already. Wilson (1998), for example, insists in *Consilience* that "Material reality discovered by science already possesses more content and grandeur than all religious cosmologies combined," and he argues that evolution may be the best creation myth we'll ever have. Neil deGrasse Tyson has hinted at similar concepts through his TV show, *Cosmos*, just as Carl Sagan (2011) did before him:

> *A religion old or new, that stressed the magnificence of the universe as revealed by modern science, might be able to draw forth reserves of reverence and awe hardly tapped by the conventional faiths. Sooner or later, such a religion will emerge.*

Similar views have been espoused by Einstein, Nietzsche, Feuerbach, and Spinoza.

Now we must fill this general idea in with specifics, something wildism is well-suited for. Thus, future work will place great emphasis on these concepts, with guiding principles, outlined theological arguments, and so forth. The idea remains mostly undeveloped, but here are three things that are certain.

First, there must be an overriding respect for truth. There is a difference between what is inarticulable as a matter of human limits and what is inarticulable as a matter of obscurity, the latter always a function of power. Indeed, something need not be inarticulable to be Sublime at all; "respect for truth" necessarily entails an understanding that intellectually reducing our experiences to material interactions does not mean a reduction in the quality of our experiences, and very often leads to their enrichment. Still, respect for truth does not mean making values impotent. Part of the careful work to be done is to distinguish between the two kinds of revisionism, as has been done in science, where values of objectivity, parsimony, and so forth may not be revised, but where the actual discoveries of work done under those values *ought* to be revised when appropriate.

Second, we must recognize the various social, psychological, and ecological roles of religion and ritual. Those who insist on faith in this age do not need more facts; they need alternatives that respect truth but do not degrade what people often refer to as the "non-scientific" aspects of religion. Not once have I found these aspects to actually be non-scientific. There is a scientific explanation for the fervor a young me felt while speaking in tongues and dancing at the altar of my childhood Church of the Pentecost. But clearly to explain such an experience in terms of chemicals and neurons would be unnecessary in most instances, even inappropriate. Similarly with the breaking of bread that occurred after service.

Wildist concepts of sacredness also have a clear ecological role to play. To understand this, consider Harris' (1974) study of the taboo against eating cows in India. He explains that the practice's function is economic and ecological: there are strong temptations to kill cows during times of famine, but to do so would have ruinous effects on the well-being of the ecosystem and would end a consistent source of milk, fuel, and labor. It would be a completely disastrous decision. Thus, material conditions select for the idea of the sacred cow, and, as he notes, different Indian ecologies lead to variations in the taboo. One cannot help but notice the parallel appropriateness of wildist concepts of sacredness in an age of even more disastrous decisions than cow-killing.

The social aspect of religion may also aid in disseminating wildist values, especially those that rely on complex concepts or that require careful exposition. For instance, sermons, stories, and poetry may help convey the awe due to the Cosmos and nature, the redeeming pessimism inherent in the wildist critique of progress, cognizance of human folly, and the like.

Finally, we might look to the psychological appeal of other religions and tease out what, precisely, is appealing. For instance, although I was raised a Christian, I spent much of my childhood and youth studying Jewish writings and tradition, and have found the Old Testament, the Pentateuch in particular, and its associated Jewish commentaries, a perpetual source of wisdom even to this day. Something about the myths of Abraham, Noah, Ruth, and David has caused them to be imprinted onto my mind forever.

There is a lot to learn from the Jewish tradition, which has many parallels to the conservationist one. For example, a Jewish friend was the first to explain the concept of the "tactical spectrum" to me, noting the gradation from Orthodox to Reform Judaism, and suggesting that is could be applied to conservation (only later did I learn that David Brower had already done this). Further, the Jewish tradition has, built in, the idea of a chosen people who will preserve the world's spiritual standing before God. Compare this to the idea of the "conscience of conservation."

I was always especially stricken by the concept of *tikkun olam*, "repairing the world." In recent years, left-wing Jewish groups have utilized this concept to push a narrative of progress, but the man who taught me of *tikkun* eviscerated these "hubristic interpretations." Rather, he stressed that *tikkun* came from the *Aleinu* prayer, where the Jewish people collectively pray for God to "remove all idols from the Earth, and to completely cut off all false gods; to repair the world." As I learned it, these idols include man's unending faith in himself. As Maimonides (1904), who wrote much about humility before God, put it, "man's intellect indubitably has a limit at which it stops." Compare this version of *tikkun* to "rewilding," a concept that has similarly been coopted by those with progressivist biases.

Catholicism is another potential source of inspiration, especially because of their success at conveying notions of sacredness. What if we develop just as effective ways to convey the notion of nature's sacredness, or the idea of wilderness as a temple? Perhaps this idea has nasty side-effects that do not properly convey wildist values, but at least the point and direction of our efforts are clear.

There is a lot to learn from the negative aspects of religion as well. For instance, religions incessantly appeal to authority, an unavoidable fact so long as they rely on supernatural doctrines. The Jewish and Catholic religions are particularly nasty in this regard. Here, wildism has a leg up, since its object of adoration is the Cosmos, and its way of knowing science, which all can practice. Furthermore, even though there is psychological appeal in referring back to ancient thinkers, wildism suffers no loss here, since what is more ancient than nature?

Although the proper object of focus in a wildist religious practice should, of course, be nature, there must also be a literary component. By "literary," I mean the broad meaning of the term and include oral tradition, perhaps even especially so. Stories have driven human understanding since at least the late Paleolithic, and religious liturgy and texts have important functions, contributing to a sense of unity and communion, among other things.

There is a final thing to stress about this idea of a religion of the Cosmos. Although the religion should not depend on the revelations of prophets or supernatural deities, it is clear that in the real world, not all men

are equally equipped to establish its foundations. Rather, the initial work should be carefully outlined and articulated by a group of learned individuals intimately familiar with and committed to wildist values, and mechanisms should be established for individuals of a similar caliber to preserve its focus and direction. If the initial crop can manage to incite a spiritual revival of the kind Muir himself wished to muster (Stoll, 1993), such a group would become absolutely necessary. Historical examples of similar revivals support this, such as the Apostle Paul's constant vigilance in sending guidance to his churches through letters (White L. M., 2005, pp. 143-216), and Marx and Engels' arguments with Bakunin about the need for learned guidance in their revolutionary movement (e.g., Engels, 1978; Woods, 2010).

C. The Critique of Progress

The "myth of progress" is the idea that artificial modification of nature can fundamentally improve the world, particularly the human condition. In particular, it addresses the *faith* that artificial blueprints can improve the human condition, often with the explanation that there was not enough tinkering in the case of failure. The environmentalist critique of progress states that this is a delusion. Concerted attempts at artificial improvement of nature have always or nearly always resulted in unintended consequences with runaway effects that progressivists never fail to argue can be fixed with more progress. Yet the unintended (and in many cases intended) consequences keep coming, because the systems that humans are trying to improve are too complex to be fully understood by them. Thinking that these limitations can be transcended without even more unintended consequences is what is meant by "human hubris" (Ehrenfeld, 1981), and the critique applies equally well to agriculture, civilization, social progress, and to the ongoing efforts of "new conservationists" to convince everyone that nature now needs us to make it through the Anthropocene.

1) Why the Critique is Important

The critique of progress is the core of environmentalism's challenge to dominant values, but the power of the critique is obscured by two things. The first is the influx of "watermelon environmentalists," or those who profess to be "greens," but who actually harbor "red," social justice convictions. Sometimes this truly is a concerted effort by socialist and communist cadres to exploit the contemporary popularity of environmentalism. Mostly, though, this is just a result of the predictable unwillingness of people to accept and profess values that are such substantial challenges to the dominant ones; or, more often perhaps, the predictable inability of many individuals to fully comprehend the clash.

The second, more harmful reason is the unwillingness of even its avid defenders to take it seriously when it clashes with the most precious of modern values. Even the wildness-centered conservationists who profess to challenge this great mythology of progress have at times, especially recently, fallen prey to the progressive narrative's power. This is demonstrated, for example, in an otherwise excellent volume entitled *Keeping the Wild: Against the Domestication of Earth*. The book is a collection of responses to the revisionist ideology of the Anthropocene boosters, who hope to make earth into a garden in the name of humanitarianism (Kareiva, Marvier, & Lalasz, 2012). However, in the book one can observe some authors claiming that the fight for wild nature is just one in a long line of progressive causes, like the fight against racism, sexism, and colonialism; that fighting for wilderness can be humanitarian; and that caring for nature is caring for "human well-being," a term borrowed from humanism and that only makes sense in a conservationist context with severe revision. The result is clear: the new conservationists are winning, and they're pulling even the old guard further to their side of the spectrum. It is almost as if the latter are saying, "See, we're progressive," "See, we aren't misanthropes."

This is why the ethical philosophy of wildism is so important. In an age where the wildness-centered ethic is suffering such frequent and relentless attacks, saying frankly and clearly what we are is a necessary step. We should not be disguising our rhetoric; we should be stripping it bare, more explicit than ever. It will inspire backlash, we will be called misanthropes, and we will be unpopular. But that is what it will take to preserve the conservationist critique, which is precisely the role of wildism: to be the conscience of conservation and the keeper of its core message. So do not be surprised if the following sections greatly offend the

modern moral sense. That is, indeed, exactly the thing that should be offended.

2) Limits to Reason

The core reason progress doesn't work is because humans simply don't know what they're doing. But let's be clear what this *doesn't* mean. For one, it doesn't mean that human beings are unable to use reason to get out of tough situations. Clearly that is untrue.

Furthermore, it doesn't mean that humans can't transcend some biological limitations with technology. For example, we might refer back to the list of animal senses that humans don't have, given in section II.C.3, like the ability of some birds to see electromagnetic fields. There is reason to believe that with a little technical innovation, humans might be able to very directly experience the same thing—that is, even more directly than seeing the fields through a screen. This is because brains in most living creatures have similar components, and seem to be very good at picking up patterns from inputs that get instant "yes, good" and "no, bad" feedback, allowing the brain to discern rules and turn the input into *perception*. For example, in one experiment, researchers put participants in a chair that poked images into the participants' backs. When they sat blind individuals into the chair, the individuals eventually gave very accurate reports of what they were "seeing" (Bach-Y-Rita, Collins, Saunders, White, & Scadden, 1969). Somehow the brain had accommodated the new input.

So the point isn't that humans can't do anything cool with their reasoning abilities, or that everything that presents itself as an insurmountable problem now is actually an insurmountable problem. But there *are* hard limits to reason. One famous example is Gödel's incompleteness theorems, which prove that any practically relevant logical system has to rely on axioms that are unprovable by the same system, and that, by extension, these systems cannot demonstrate their own consistency. See also Chaitin (2006). Another example is chaos theory, which studies phenomena that are so highly sensitive to initial conditions that humans can't hope to practically predict their behavior. Even though problems with chaos are strictly speaking practical problems, they are in many cases insurmountable practical problems.

But let us return again to the hard limits in moral reasoning mentioned in section II. To review, we established that much of morality is primarily biological, like incest taboos; that moral first principles are incommensurable; and that humans have almost nothing to work with when it comes to many modern moral problems, like those concerning large populations of people.

The problem, generally stated, is that humans evolved in hunter-gatherer conditions, and their intuitive systems, what Kahneman calls "System 1," are well-suited to those conditions. But when you throw what are essentially Stone Age creatures into modern life, things get a little thorny, and we have to depend much more on our slow, System 2, analytic systems. You might compare this to a DSLR camera, with automatic settings well suited to certain conditions that the manufacturer could foresee, but also equipped with a manual mode for unforeseen conditions.

Some moral philosophers like Peter Singer (1981; 2000) and Joshua Greene (2013) argue that we can distinguish between those moral precepts that are purely biological or intuitive and those that are the result of moral reasoning, and that with this knowledge we can decide how to properly modify human nature to improve the human condition. That is, we can make moral progress. Singer in particular speaks of these ideas in the context of biotechnology and genetic engineering. But there are real problems with this idea.

The most obvious is defining "better." Both Singer and Greene, as well as many other moral thinkers, argue that this is actually a non-issue. *Of course* humans would all want to improve their "well-being." Clearly, wildists think that wildness is more important than well-being, however, so the universality of well-being as a first principle is not at all obvious. But here we need not get into an argument about first principles, lest our critique of progress be merely a restating of the wildist ideology. We can simply assume that these utilitarian humanists are correct, because even then there is serious doubt as to whether human beings can achieve the goal.

A major and insurmountable hurdle is the fact that humans "improving" human biology is a self-referential exercise. Thus, no human can fully understand the implications of this "improvement" until the change

has already been made, making it an open question as to whether or not it is actually an improvement. For example, consider a human brain that is modified with computing technologies to be more intelligent than any previous being could ever have hoped to be. No one knows what all the implications of this would be, but we do know that the end result would essentially be a human who is to us what we now are to dogs or monkeys, as far as intelligence goes. Indeed, the founder of information science, Claude Shannon, said, "I can visualize a time in the future when we will be to robots as dogs are to humans…[and] I'm rooting for the machines" (Liversidge, 1987). This is an example of a hard limit on reason's ability to ensure that moral "progress" is actually a good thing.

A similar kind of problem applies to the development of societies, which are very important to human well-being. We cannot ever hope to rationally control the development of a society because if, for example, we come up with a technical system that can predict all the consequences for a society at a given level of complexity, predicting the consequences of that technical system would necessarily require an even more complex society.

Practical problems are even more insurmountable than these hard limits. I've already mentioned chaos theory, for example, and it applies to many aspects of social systems and the human body. But there are also limitations in how reason can be applied in the context of a society, because cultural development is an evolutionary process that takes place above the level of human intention. Thus, while human intention provides the "motor" for much of the evolutionary process (although not all of it), selection pressures that include more than and are more powerful than human intention decide the outcome of a particular cultural meme. The same applies for technical development.

Consider this analogy. In a version of UNO I often play with my family on holidays, individuals keep a tally of how many points are in their hand after each round has ended. When someone surpasses 500 points, the game ends, and the winner is the person with the least number of points. However, if someone hits 500 exactly, they go back to zero. Sometimes individuals end up with a number of points very close to 500, and they begin to think they can manage to keep just the right amount of points in their hand so that when someone else goes out, they will have 500 points exactly, go back to zero, and have a shot at winning again. The problem is that no matter how much skill and reason someone puts into trying to reach 500 exactly, there are still an enormous amount of factors that the person could never control, and that ultimately determine whether he will actually achieve his goal. Reason isn't enough. Cultural evolution works similarly. See Nia *et al.* (2015) for an example of this idea as applied to violin acoustics.

Just as in biological evolution, this all occurs without a rational creator, and is in some part due to chance happenings. The x-ray and penicillin, for example, were discovered by accident, and we still use the Gregorian calendar mostly because it happened to be invented in the right place at the right time by the right people, not because it is it the most rational or economic choice, or because it contributes most to human well-being, all of which are arguably or demonstrably false (99% Invisible, 2015). Ideas expounding on this idea of cultural evolution are now widespread (Basalla, 1988; Boyd & Richerson, 1988; Cziko, 1997; Ridley, 2015), but there is unfortunately no comprehensive synthesis just yet. Nevertheless, it is clear that human intention and attempts at control do not have the final say in how a society turns out, and in many cases are very weak contributing factors.

Here's another practical limitation: Many people have pointed out, like I have, that humans are Stone Age creatures in a modern world, and that this calls for greater use of our evolutionarily-endowed ability to reason. And even though this whole section is an exercise in defining a more modest place for reason, no one can deny that reason has done remarkably well. The problem is that in a modern world, even one mistake can be absolutely devastating. We are creating a world where we have to think very, very hard to make the right decision sometimes, but circumstances are not quite as accommodating as might be required for a good enough track record. Decisions made in war, for example, must be swift and ideally the most moral decisions possible, but such devastating and complex modern weaponry means both an increased chance of error and greater consequences as a result of those er-

rors. One fix to this would be machine decision-making, of course, but that will be addressed more fully later on.

One might respond to all this by arguing that the bar for understanding has been set too high, and that humans do not need to know so much about a system to have a reasonable expectation that it will be improved with modification. In some cases this is true, especially when it comes to systems with which humans should have evolutionarily-endowed mechanisms to properly navigate, like small groups. But it is clear that at least some of the problems we are facing do indeed require an extremely high level of understanding.

For example, I've already mentioned Singer's suggestion that we modify our human nature with genetic engineering when this becomes feasible, and other thinkers have done the same. Richard Dawkins has said we should be "deliberately cultivating and nurturing pure, disinterested altruism—something that has no place in nature, something that has never existed before in the whole history of the world" (Singer, 2000, p. 63).

But, in addition to the above-stated problems, we've been wrong about morality before. Slavery is the most glaring example. And once we've engineered enough people to defend the moral blindspot that is the modern-day equivalent of slavery, the damage will have already been done, and there may then be no way to reverse it. I'm oversimplifying, but recall the editor of the *Journal of Medical Ethics* insisting that we have a moral duty to engineer "ethically better" babies. It just takes one wrong decision.

We might also consider the problem of artificial intelligence, mentioned briefly above. If we engineer a computer to know as much as a human, then it will almost instantaneously become smarter than a human. The moment we reach singularity will be the moment we move beyond it. But if these superintelligent computing beings are or become malicious (again, oversimplifying), there isn't much we would be able to do about it. Proposing that we simply turn them off would be like proposing the monkeys turn us off because we keep destroying their habitats.

And in any case, even without such a high bar for understanding, real-world examples show that human reason is nonetheless inadequate for dealing with modern problems, both because of hard and practical limits. A pressing contemporary example is the change being wrought by self-driving cars. In an article entitled "Why aren't urban planners ready for driverless cars?" one planner was quoted as saying, "We don't know what the hell to do about it. It's like pondering the imponderable."

So far I have only addressed human nature and culture, but when it comes to ecology and non-human nature, human reason has failed tremendously *and we still keep making the same hubristic decisions*. For example, climate is one of the stock examples of a chaotic system, but in response to climate change some scientists are seriously contemplating geo-engineering. That is, they hope to use technology to artificially offset some of the damage that has been done already so that certain regions of the world may be more fit for the "well-being of conscious creatures." Some scientists are even actively lobbying in support of geo-engineering, despite us knowing almost nothing about it and its potential effects.

Finally, a major limitation of human reason is that it is done by humans, who are not wholly rational creatures, and who will sometimes make unreasonable decisions even when reasonable decisions are possible. This is a simple critique, but perhaps one of the most powerful and devastating of them.

The conclusion of all this is that human attempts at rational control are extremely limited in their effectiveness, even when it comes to non-wildist moralities. All the unintended and negative consequences listed in the next section should demonstrate this point even more thoroughly, and seeing the whole critique in the context of wildist ethics should be enough to deliver a final blow to the myth of progress. But if that's not enough, there is more, which will be explained more fully after exploring the consequences of human folly.

3) Unintended and Negative Consequences

If it is true that there are notable limits to human reason, it should also be true that history is full of unintended and negative consequences as a result of "progress." Indeed, this is the case.

A favorite example of conservationists is the car, which introduced far-reaching social changes and has, as has been mentioned, wreaked havoc on nature.

Some aspects of the technical evolution of cars were a result of human reason. But far more than human reason has decided on the outcome that we are now living with, including infrastructural selection pressures, economics, and so forth. Thus, while human reason is a necessary component of cars existing, it is far from the whole story, and not the most powerful force deciding the direction of the car's technical evolution.

Diamond (1997) applies this same kind of argument to the transition from foraging to agriculture, arguing for the importance of ecological and demographic pressures in explaining the transition, rather than human reason and intelligence. In an article dramatically entitled "The Worst Mistake in the History of the Human Race," he further eviscerates the idea that the transition is in any way a result of calculated reason, and shows that it is not at all a clear improvement over hunter-gatherer ways of life. He points out that individuals living in agricultural societies were on average more malnourished, more susceptible to disease, and more socially stratified compared to their hunter-gatherer counterparts. He specifically calls out the progressivist notion that "we're better off…than people of the Middle Ages, who in turn had it easier than cavemen, who in turn were better off than apes."

Less common than the example of cars and agriculture are the ill effects of industrial medicine. Of course no one would deny that industrial medicine has achieved amazing things. But one cannot separate the good parts of medical technics from the bad parts, not even with further technical innovation, and the bad parts of industrial medicine are turning out to be *very* bad. One example is anti-microbial resistance. Another are the high number of sicknesses that are caused by the very technical infrastructure that permits industrial medicine to exist. One can of course always posit that more technical innovation, efficiency, and training will correct the problem, and hypothetically this is true. But the principles of technical and cultural evolution, combined with the other weaknesses of human reason listed above, and in the context of the not-so-great historical track record, all break that argument down thoroughly. Of course innovation, efficiency, and education can change the problem and even in ways most people would agree are better, but reason alone is only a minor influence in the overall development of industrial medicine, meaning for the most part, if we want the good of medical technics, we have to also take the bad.

By now it should be clear that the wildist critique of progress isn't just that "the process of progress isn't living up to wildist values," and in fact the critique is of all kinds of progress. Nevertheless, the process of progress doesn't line up with wildist values in an important way: progressivism calls for a technical solution to the negative consequences of previous technical solutions, which always results in more negative consequences. Of course, the negative consequences often come with positive ones as well, but it is important to note the negative consequences because constant technical solutionism results in an inexorable degradation of wildness.

This is really quite obvious once you think about it. In the context of wild nature, nature provides the necessary components for survival. But when humans modify nature, they must keep up the process of perpetual modification, because the rest of the natural system has not evolved to function in that state. That is, humans must use their energy and labor to "fill in the gaps." For example, without any human intervention, natural processes will deal with animal feces. But a toilet requires entire technical systems of human labor, waste disposal, state management, and so forth. The plumbing is convenient, this is true, but at the cost of great overhead, necessary policing, and further modification of nature.

A civilization is the same kind of problem magnified a thousandfold. But in the context of a world with finite resources and energy, there is an inevitable end to a process like this, which requires progressively greater resource use and energy expenditure. This was pointed out by Joseph Tainter (1990), who observed that civilizations eventually reach a "point of diminishing returns" and begin a process of collapse. This has happened with almost every civilization, only a few having lasted to form the modern one, and there is no reason to think that the same thing will not occur again. In fact, Tainter posits that industrial civilization has already reached the point of diminishing returns.

To illustrate in a more intuitive way what this means, consider the following: My father recently said

that he didn't think New Orleans should have been redeveloped after Hurricane Katrina. He found it beyond reason that someone would build a city below sea level—"Why did we even do that in the first place?"—and then gave this piece of wisdom: "Besides, if you think about it, the levees are bound to break again." I couldn't help but say it: "Dad, that's a perfect metaphor for what I've been saying about civilization."

4) The Human Condition

But let's return to the topic of progress assuming that the utilitarian humanists are right that "well-being" is the highest moral value. If it is true that humans cannot expect their blueprints to turn out as planned, nor can they expect the blueprints to always be adequate, nor can they expect humans to even pursue implementing the blueprints (no matter how rational), then it seems remarkable that modern societies so thoroughly exemplify left humanist moral values. Despite claims to the contrary, violence is decreasing and has been for a long time (Pinker, 2011); women, gays, and other minorities are, so far as we can tell from the available data, doing much better than they were just several decades ago (ibid.); digital technologies are uniting humans across the globe and possibly expanding the circle of moral consideration (Singer, 1981); and so on.

The reasons for this are not, however, because the left humanists have somehow succeeded at transcending the limits of reason and pushing the world in a more enlightened direction. Rather, industrial civilized conditions select for left humanist morality. In other words, left humanism is an argument for civilized conditions *after the fact*. This is the same idea espoused by Marx when he wrote, "It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness" (Marx, 1904, p. 11).

This takes us to perhaps the most devastating strike against the left humanist narrative of progress, which I've singled out several times because of its dominance: leftist progressivism is dominant because it is helpful for the functioning of industrial civilization, not because it improves the human condition.

At one point this was less clear. The doctrine of the blank slate, or the idea that human nature was a blank tablet waiting for environment and conditioning to fill in the white space, gave people the illusion that with just the right environmental changes, the human condition could be improved. If this doctrine was true, the idea of constant tinkering and technical solutionism would sound a lot saner. But the new sciences of human nature have shown the blank slate doctrine to be false (Pinker, 2011), which has lead people like Steven Pinker, Peter Singer, Richard Dawkins, E.O. Wilson, and others to advocate modification of human nature itself (they call it "improvement"). In other words, it turns out that left humanism is not about *humans* at all.

D. Conserving Human Nature

1) The Meaning of Human Nature

"Human nature" is the part of human beings that is not controlled or made by them or their technical systems; that is, it is the part of humans that is the product of non-artificial evolution and is biologically innate. Like all of nature, human nature can possess a high degree of autonomy (wildness) or a low degree. The autonomy of human nature is what we call "freedom."

There are extremely prevalent misunderstandings attached to the contemporary scientific notion of human nature. Most of these have been adequately addressed by Wilson (1978), Cosmides and Tooby (Barkow, Cosmides, & Tooby, 1995), Pinker (2002), and others, but I'll briefly address one major problem here: the "nature versus nurture" argument.

The argument is a stale outgrowth of what Cosmides and Tooby (see above) refer to as the "Standard Social Science Model," which entails a belief that culture is autonomous from material processes and that cultural phenomena can be best known in terms of other cultural phenomena, like power. Once we ditch this model for materialist reductionism, argued for most aptly by Wilson (1998), we are left with the conclusion that human behavior is shaped by a combination of innate biological drives and environmental factors. The result is still a deterministic outlook, but it is not only biologically deterministic.

Nevertheless, when we recognize that biology determines certain aspects of human behavior, we also have to recognize that biology limits the *range* of possible human behavior and modes of social organization, insofar as the biological limits cannot be transcended with technics. Wilson (1978) explains this by asking his readers to imagine that a range of behaviors

A-Z is present in all of nature. Zebras, he writes, may be biologically endowed with the capacity for D-Z, but unless under extreme environmental pressure usually express the letters between D-M. This would be "zebra nature." Human nature functions the same way.

2) Linking the Two Natures

Man is linked to nature by virtue of their joint material condition. This is not an obvious fact to many, and the fight for acceptance and recognition of it has a long history. Darwin, for instance, in a world gripped by Christianity, initially avoided applying evolution to humans, and it took Thomas Huxley's bellicose manner for the issue to be brought forward publicly in the man's famous debate with a bishop (of course). Later, Huxley's *Evidence as to Man's Place in Nature* (see Figure 1 for differing uses of "nature") and Darwin's *The Descent of Man* further established that human beings are animals and subject to evolutionary processes as much as any other living creature.

Much of the continuing effort to link man and nature continued in the field of anthropology with the work of individuals such as Ernst Haeckel, Eugène Dubois, and Franz Weidenreich. Primatologists have also been influential. When Jane Goodall reported on apes using tools in a time when tool use was considered unique to humans, the anthropologist Louis Leakey said, "Now we must redefine 'tool,' redefine 'man,' or accept chimpanzees as humans" (Goodall, 1998).

In other words, the scientific evidence suggests that the biggest thing humans have to learn about their condition is not what makes them separate from the rest of the material world, but what tethers them to it. Of course, this is easy to say, but history shows us that the endeavor is littered with many battles, some terrifying.

E.O. Wilson, when he suggested that humans are indeed subject to the processes of evolution, had water poured on his head by an upset activist and suffered profound backlash from many academics (Alcock, 2003). This was more than 100 years after *Descent of Man*. Similarly, Paul Ekman, when presenting his findings that a core set of facial expressions are universal among humans (and so probably biological in origin) found himself interrupted by a prominent anthropologist in the audience, who stood up and demanded that Ekman not be allowed to continue because his views were fascist (Ekman, 1987). And then, of course, there is the rising popularity of creationism in the US—something formidable enough that Bill Nye thought it appropriate to debate a prominent figure in the movement, the founder of the Creation Museum in Kentucky.

With all this trouble, it is no wonder that conservationists have not stressed applying conservation to human nature. But now more than ever there is a need to extend the conservation imperative, and this is a major aspect of wildism. The logical chain develops easily once we recognize the truths fought for by Darwin and Huxley and Wilson.

For example, if non-human animals display all sorts of negative symptoms when they are caged and domesticated, would not the same apply to caged and domesticated humans? Would humans not be better off wild? Quite a bit of evidence suggests that this is the case (Wu, 2014; Diamond, 1999; Sahlins, 1972; Abramson, Seligman, & Teasdale, 1978).

In extending the conservation imperative, there is the threat of making conservation all about humans, given the dominant tendency to forget about the bears, elephants, insects, turtles, and other non-human entities that are suffering as a result of civilized man's actions. Indeed, even if man could not be saved, the intrinsic worth of non-human nature is reason enough to challenge ongoing industrial devastation.

Nevertheless, the conservation imperative must be extended. Although it is true that the intrinsic worth of non-human nature is reason enough to challenge industry, the fate of human nature is linked to the fate of non-human nature. Industry requires that man modify his humanness just as much as it requires the modification of non-human nature. Furthermore, conservation flirts with failure by not challenging the narratives that legitimize the modification of human nature, like social progressivism, because they are the primary justification for civilization's existence. Most recognize by now that civilization has been a net negative for the animals and plants. But even in the case where people believe that we can continue to "improve" the human condition without adversely affecting non-human nature, the very pursuit of human "improvement" is what justifies civilization's development.

But in extending the conservation, wildists do not insist that human nature is "good." As with nature generally, it includes beautiful and ugly, comforting and terrifying, attractive and heinous components alike. Thus, the logic is not that we should conserve nature because it is good, but because "progress," or human attempts to improve it, is a lie. Indeed, someone could easily be a wildist and maintain an ambivalence toward both natures. In this way, the wildist understanding of nature and our duties toward it is as complex as the Jewish idea of Yahweh, a simultaneously wrathful and graceful God, whose grandeur inspires fear as much as wonder, as anyone who has read the Pentateuch is keenly aware.

The rest of this section will further explain the threat to human nature, but will speak little about what conserving it will or ought to look like. Some examples include resisting propaganda and surveillance technologies and especially biotechnology, but I leave it an open question as to what is strategically the best focus, as well as what shape this resistance might take. This is primarily because we must take extra care not betray a key assertion of our ethic, namely, that all of nature matters, not just humans. So far, wildlands conservation offers the best balance of these considerations, so at least for now, we should remain focused on it (see section III.F).

3) Humans Need Not Apply

I've mentioned already that modern man must use his analytic mind (System 2) more and his intuitive mind (System 1) less. There is nothing necessarily wrong with this. Indeed, wildism is an exercise in analytical thinking since reason, morality, and science truly are some of the best tools we have to deal with the conditions created by our newly evolved capacity for cultural evolution "unlinked" from biology. The problem with the progressivists is that they are arguing for a world where the analytic mind is favored at the permanent expense of the intuitive mind. It is not mistake that Greene (2013), who argues that we can improve our moral sense, demonstrated his claims with brain-damaged individuals.

Sometimes this is clear in the case of specific technologies or technical systems. One example comes from an article in *Aeon*, "Is Technology Making the World Indecipherable?" (Arbeson):

> *Despite the vastness of the sky, airplanes occasionally crash into each other. To avoid these catastrophes, the Traffic Alert and Collision Avoidance System (TCAS) was developed. TCAS alerts pilots to potential hazards, and tells them how to respond by using a series of complicated rules. In fact, this set of rules — developed over decades — is so complex, perhaps only a handful of individuals alive even understand it anymore.*

But the larger point is that this is becoming true of society as a whole. For example, developer Kevin Slavin (2011) has pointed out that 70% of the stock market operates by algorithms that do the trading for brokers, but that no one truly understands (this is called "black box trading"). In fact, some people's sole duty is to examine the automated systems and pick out individual algorithms that run it. As a result, when something like the Flash Crash of 2:45 happens, that is, when 9% of the stock market simply disappears in seconds, no one can give an explanation. A 2013 article from *Nature* echoed this, the authors explaining that finance functions because of a "machine ecology beyond human response time" (Johnson, et al., 2013).

This "machine ecology" is driven largely by artificial intelligence, the merger of biological and computing systems, and things like "evolutionary programming" (where programs "evolve" instead of being created directly—see Arbeson), and in the economic realm this new wave of automation is likely to have far-reaching repercussions. To be clear, these repercussions will not be apocalypse, as some doomers might have it, but they will probably underpin more unrest than other economic crises, such as the Great Depression or the first wave of automation at the start of the Industrial Revolution.

To illustrate: one study recently predicted that 47% percent of the workforce is slated for unemployment due to technical advances (Frey & Osborne, 2013). Unemployment during the Great Depression reached only 25%. And while a common argument is that technical innovation has always provided more jobs, this has been true only in the long term. In the short term, rapid economic changes have led to quite a bit of instability, and this second wave of automation is occurring at a rapid enough rate for something comparable

to happen (CGPGrey, 2014; Thompson, 2015). Self-driving cars, for instance, will cause immediate turmoil for one of the world's largest industries, transportation. And already some innovations spurred on by computing technologies, like Uber, have incited riots by Taxi drivers (Clifford, 2015), echoing the Luddite revolts early in the Industrial Revolution.

Three possible outcomes for human nature, or a combination of them, could result from this second wave. The first two assume human nature will not be significantly modified, which will either lead to human irrelevance or human leisure. That is, if we imagine something similar to the techno-utopian's "post-scarcity" economy, either all humans or a large amount of them will become useless and a drag for the technical system, leading to their extermination or exploitation (since their labor will be cheaper); or humans will benefit fully from post-scarcity and not have to worry about much but their chosen "self-actualizing" endeavors. The reality is likely to be a combination of both, as it is now and has been since the advent of civilization, where some people in more materially developed nations live leisurely lives and those in underdeveloped nations are exploited and regarded as expendable, if only implicitly.

Still, the major threat according to most humanitarians, scientists, and others from the technician class, is a widening gap between the rich and poor (Brian, 2014; Gates, 2015; Agger, et al., 1964). Steven Hawking (2015), for example, wrote:

> *If machines produce everything we need, the outcome will depend on how things are distributed. Everyone can enjoy a life of luxurious leisure if the machine-produced wealth is shared, or most people can end up miserably poor if the machine-owners successfully lobby against wealth redistribution. So far, the trend seems to be toward the second option, with technology driving ever-increasing inequality.*

Note, then, that the economic changes in late industrial society are the selection pressures for social progressivist ideologies, as was argued previously. For instance, if inequality is poised to be a great economic destabilizer, the social system will require efforts to mitigate inequality if it is to survive. Thus, the major institutions and figures of industrial society, from international organizations to college campuses to transnational organizations, espouse this ideology of social progress.

One other possible future for human nature is worth mentioning, and is likely to combine with the other two. Instead of remaining "mere" biological creatures, it may soon become economically important to more extensively modify our own natures, such as through genetic engineering, so that we will merge with the already-existing "machine ecology." Thus, human biologies will become cultivated much in the way land is cultivated for economic productivity. And although these changes may begin as optional, so did cell phones and cars.

Already there are some emerging narratives to prepare the way for these new technical and economic conditions. The philosophical underpinnings are a thoroughly postmodern attempt to break apart and weaken the concept of "human nature" (Haraway, 1991), much in the same way postmodernists have attempted to attack the concept of wilderness primarily on the basis of social justice concerns. On a higher, less philosophical level, the new narratives are becoming united by a vision has been described as "transhumanism," espoused by men as prominent as Google's director of engineering, Ray Kurzweil.

A final note: without dismissing the severity of the current predicament, it is important to recognize that even as many aspects of human naturalness are severely threatened in this late industrial age, the *autonomy* of human nature has long been violated, and civilization depends on this violation. Pinker (2011, pp. 31-58), for example, refers to the advent of the state as "the pacification process," and Elias (Elias, 1982) writes of "the civilizing process," which describes the creation of the European "second nature," or internalized norms imposed by the new social conditions. Furthermore, every major civilization has been built on the backs of slaves, and industry, a much more intensive mode of production than agriculture, was only made possible with an equally more intensive kind of slavery, namely, the Atlantic Slave Trade (Williams, 1944).

More examples abound: the whole history of colonialism, nearly any instance of civilized peoples coming into contact with primitive ones, and the popular revolts that chronically afflicted feudal societies all illustrate the same story of human domination and resistance to that domination. (Wildist historians would do well to provide an account of these histories to the public.) But it would be a mistake to name the enemies here as "the colonists," "the Westerners," "the whites" or "the landlords." Instead, these actions are impossible or near-impossible to separate from the overall development of civilization (i.e., progress), and they can only properly be understood in the context of the larger wildist and conservationist critique. Further on, this concept will be differentiated from the idea of "social progress."

4) Man and His Relations

Of course, human nature is not just about individuals; it also has a social component. There is some controversy as to the evolutionary mechanisms behind human social behavior (i.e., whether group selection theory or kin selection theory is correct), but it is generally agreed that the natural social domain of human beings is rather small. In fact, the anthropologist Robin Dunbar (1992) took steps to discover those limits, and he found that, generally, humans only have the capacity to sustain about 150 or so relations (usually much lower), after which stable and cohesive groups require more restrictive rules and regulations or some other kind of artificial intervention. This is predictable, given our evolutionary history as nomadic hunter-gatherers whose social domain was restricted to bands of 40-100 humans.

This is in stark contrast with the modern condition, where we are encouraged to care about all of humanity, and even animals, equally. Such behavior is of course necessary in an age of increasing interconnectedness, where favoring our relations could diminish productivity and economic stability. Thus, industrial society continues to exist not only because of its modification and degradation of human nature, but because it requires an individual's loyalty to his relations be kept at a non-threatening level or be broken down completely. For example, nepotism is the scourge of many areas attempting to industrialize, and in-group loyalty with "no snitching" codes often get in the way of effective law enforcement. Consider again the limitations to human moral reasoning discovered by Paul Slovic (section II.C.3).

This does not necessarily mean that we should resist modification of human nature by doubling down on in-group loyalty, especially since many modern people lack an in-group. To the contrary, just as we may use reason while preaching against a world where reason dominates against all else, we will undoubtedly have to cooperate at larger-than-natural scales in order to most effectively achieve our political goals. Sometimes attacking a problem directly is simply not the most effective way of dealing with it.

5) The Case of Social Progressivism

With all this technical and economic change has also come a set of justifying narratives that I've referred to collectively as "social progressivism." The dominant narrative of social progressivism today is the left humanist one (as opposed to, for instance, colonial progress narratives).

Its first major wave after the Industrial Revolution came in the form of various reform movements and individual thinkers like the utopian socialists, Adam Smith, Jeremy Bentham and John Mills, and Karl Marx. Its second major wave is known as the Progressive Era, which included muckrakers, anti-corruption activists, and proponents of "scientific management." Finally, its contemporary incarnation is preached most forcefully by the activists who are involved in what Pinker (2011) calls "the rights revolutions." Note, once again, that all of these are attempts to "correct" the ills caused by the Industrial Revolution or to use new technologies for social innovation, and they were not and are not the driving force of technical change.

I've singled out social progressivism instead of colonial progressivism or scientific progressivism because it is not widely challenged, even though the critique of progress applies as much to it as all the other narratives. This is primarily because left progressivism is the dominant ideology of late industrial societies. Thus, in an effort to have broad appeal, or simply by virtue of the fact that left progressivist values are normalized by institutions like the UN, mass media organizations, or college campuses, conservationists attempt to frame their work in the context of social progress. But wildness-centered conservation often contradicts

the goals of these activists and are emphatically not a part of their grand history.

Many examples are simple. For instance, a vast majority of anti-racist activists wish to eliminate not just power differences among blacks and whites or national citizens and immigrants (etc.), but also prejudice in general. But prejudice against out-group members, including people with different skin-colors, is part of human nature, to the point that even wholly artificial and inane categories can incite in-group/out-group mentalities (Kubota, Banaji, & Phelps, 2012; Gottfriend & Katz, 1997; Reynolds, Falger, & Vine, 1987; McEvoy, 1995/2013; Pinker, 2011, pp. 320-343, esp. 331, 336, 338, 343). This prejudicial human nature is a major reason racist power differences arose in modern conditions, with their extremely radical changes in demography (McEvoy, 1995/2013) and new technical environments, like cities. Other infrastructural factors, like geography, help explain why Europeans specifically came to dominate the globe.

As another example, a significant population of feminists and queer theorists say that gender is a "social construct" and that it is "fluid," so that a single individual may move back and forth on the "gender spectrum" throughout their life. This is a delusion (Halpbern, 2013; Pinker, 2002, pp. 337-351). Gender and sex, and there is no meaningful difference between the two, are rooted in complex biological organs, mechanisms, and hormones, and they are in no way simply "social constructs" or much of a choice. Furthermore, there are clear and measurable differences between men and women, which could explain or partially explain differences in employment, the pay gap, and other gender issues (ibid.).

These untrue social progressivist ideas arose in order to justify pursuit of equality, as did the blank slate doctrine generally (Pinker, 2002, pp. 16-17, 141-158). But they are comparable to the spiritual and religious narratives that played ecological functions for some primitive humans: they work, but are untrue, and very often scientific explanations work even better (see, for example, the work of Marvin Harris). Thus, some thinkers are calling for a scientific left that recognizes human nature and is not afraid to cultivate it in pursuit of left humanist aims. I've already mentioned the a few of the most visible advocates of this idea, like Peter Singer (2000; 1981) or Noam Chomsky (Chomsky & Foucault, 2006, pp. 38-39).

I must restate that being in opposition to this effort and advocating the conservation of human nature is not the same as espousing prejudice (for instance) as a good thing. The wildist argument is not that nature is good, but that the belief that we can mold it to our preestablished blueprint is delusional, will have major negative repercussions, and will come at great cost to wildness. As will be more extensively argued later, progress itself has caused many of the problems the left progressivists are now trying to fix, but any attempts to challenge a society on the basis of its own values are doomed to fail, because even the society will agree that violation of those values is bad, and will give the inevitable response: "Let's fix it."

Wildists also do not exactly argue that because something is "natural," there is nothing we can do about it. This is an emotionally complex issue, but not particularly difficult to understand intellectually. For instance, Dave Foreman was widely criticized by social ecologists and other leftists for his comment that the US should not give aid to Ethiopia. I will not deny that the form of the statement was tasteless and insensitive, but I stand behind Foreman's opinion and the reasoning behind it, especially after he better articulated it, some time later, in a written debate with the leader of the social ecology movement, Murray Bookchin (Bookchin & Foreman, 1999).

Essentially, Foreman argued that a huge part of the problem in Ethiopia was rooted in demographic pressure, that is, too many people and too few resources, and ecosystem restraints, like climate change. This is true (Brown, Gardner, & Halweil, 1998; Ehrlich & Ehrlich, 2009). Furthermore, even if the social ecologists are correct that with enough technical infrastructure managed the right way, resources from other parts of the Earth can be redistributed for the well-being of Ethiopians (the progress narrative), they fail to note that this technical infrastructure will consist of roads, fuel extraction, and so on, betraying the "ecology" part of their name.

But the rest of the argument is better communicated by way of analogy. I once had a friend who suffered from mental illness, the kind where not taking his medication was itself a part of the mental illness, and he

consistently attempted suicide over the time period that I knew him. At first I tried to fix the problem, pressuring him to take his medication, and so on. But not only was it exhausting, it was impossibly exhausting, especially because he frequently managed to get out of taking his medication anyway, and because the medication didn't always work as intended. Even though it was not wrong or unnatural for me to worry about him, I eventually had to accept that there were forces more powerful than me that would decide his fate. It turned out that the fate was death by suicide. Of course, understanding all this intellectually does not do anything about my hurt, but at least as I have figured out how to manage that hurt, I've done it in the context of moral wisdom.

This roughly parallels many social issues like the problem of poverty in Ethiopia. Of course, the problem isn't that Ethiopians have a mental illness, nor are the sexual practices of individual Ethiopians even close to the whole story. But there are many forces outside of human control deciding on the country's fate, and further human attempts to tinker "just enough" to improve well-being, ignoring these more powerful forces, are, as all attempts to implement social blueprints, going to go differently than planned and at great cost, often to human well-being itself.

In addition, there are much clearer and less sensitive issues with the left progressive notion of "poverty." In many cases it is a code word for "not industrialized," the goal, of course, being to develop the nations, which is clearly opposite of conservationist values. In other cases, it is referring to actual poverty, which is largely a result of industry itself. As mentioned earlier, Diamond (1999) notes that the advent of agriculture brought social stratification that lead to decreased health and well-being for nearly everyone but the elites. Industry has not fundamentally changed this state of affairs. While the Industrial Revolution did indeed bring *materially* better conditions for individuals in first-world nations, the majority of humans in the third-world, and those living in extreme poverty, would have been better off as hunter-gatherers.

With all this in mind, it is hard to conclude that wildness-centered conservation is the next step in the ladder of progress. Social progressivism seeks not to increase the wildness of the world but to manufacture social relations that are conducive to the functioning of industrial society, even by actively modifying human nature and its associated social behavior.

6) The Social Progressivist's Trick

Interestingly, the grievances associated with social progressivism are not all illegitimate; but in recognizing them, the progressivists play a trick (see Kaczynski, 2010, pp. 190-205 for more on this trick). That is, some issues associated with left progressivism are repugnant even on wildist grounds, such as slavery and colonialism. However, in order to properly understand the wildist perspective, we must distinguish between human domination of humans and human domination of nature.

Human domination of humans is sometimes an aspect of nature (e.g., Somit & Peterson, 2001). Some associated with left-wing radical environmentalism insist otherwise, like green anarchists, anarcho-primitivists, or social ecologists. Consequently, they preach a noble savage narrative and see "domination" of humans and nature as one and the same. However, even apart from relying on an incoherent use of "domination," this idea contradicts our entire understanding of evolutionary theory and associated concepts, like game theory, and it is a rather odd perspective in the first place, as is evidenced by any actual time in nature or, according to some, time spent with hunter-gatherers (Chagnon, 2013; Chagnon, 1997; Diamond, 2012; Everett, 2009, p. 89; Holmberg, 1950). It is no mistake that a synonym for wildness is savagery.

But our distinction between human-human and human-nature domination complicates the simple definitions of "naturalness" and "wildness" given earlier. Earlier I wrote that "naturalness" means "not controlled or made by humans or their technical systems," and I wrote that "wildness" or the "autonomy of nature" is that "not controlled" part. Also recall Figure 1, the spectrum of naturalness in the context of the material Cosmos. Finally, recall that "control" or "domination" of nature is not synonymous with "influence" (Hettinger, 2002), and often being on more equal footing with nature contextualizes the boundary between the two, just as a husband and wife might influence each other more profoundly than two strangers without their influence crossing over into the territory of domination. As Fox (1993) puts it, to say something has

intrinsic value is not to say it is "inviolable," even if relentless and far-reaching violation might make moral defense more sensitive to such a threat.

That bit about influence versus domination is important. The root of our problems lies in our evolved capacity to outpace biological evolution with cultural evolution, something that probably happened in the late Paleolithic era. This is not necessarily a bad thing. At least, that's not the claim of wildists, even if it is arguable that the ability has made our species non-viable—often the argument of misanthropists but suggested even by men like Chomsky (1998). Rather, this ability has created the phenomenon mentioned earlier, where humans must "fill in the gaps" that aren't naturally filled when our cultural innovations mismatch with the biological landscape. This was exacerbated with our transition to agriculture at the beginning of the Neolithic, when Wilson suggests cultural and biological evolution truly became "unlinked" (Lumsden & Wilson, 2005), and it was made even worse with the Industrial Revolution.

The conservationist asserts that the results of this unlinking, like species extinctions or alienation from nature, are troubling. Luckily, we find that the same evolved capacity for complex, creative reasoning and morality, which allow us environmentalists to identify a moral problem in the first place, could contribute to a positive response. In order to speak about these issues efficiently, wildist ethical discourse establishes a split between "naturalness" and "artificialness" and speaks of artificial domination of nature, a mostly adequate linguistic convention. But since human domination over other humans is sometimes a result of natural conditions, such as male hierarchies, it cannot be called domination of nature, just as it would be absurd to say that the domination of alpha wolves over others in the pack is wolf domination of "wolf nature."

Nevertheless, when these conditions become sufficiently "mismatched" from our hunter-gatherer conditions, they start to require artificial restrictions and development to "fill in the gaps," resulting in a loss of wildness and consequences for us humans. We are not particularly happy when we are perpetually subject to artificial management. But the key is that the tension is between artificial domination and our biologies, our human natures, rather than being between two groups of humans. This is the state of things because cultural evolution has outpaced our natures as much as it has outpaced nature as a whole. As evolutionary psychologists Cosmides and Tooby (1997) put it, "our modern skulls house a stone age mind," a cause of many modern problems, and also the reason we find ourselves unable to properly deal with the massively-scaled crises of late industry like climate change.

This is the key to understanding much human unrest over the course of civilization. Humans were not made to be slaves, so humans put in the trying conditions of slavery will revolt. Humans did not evolve to be happy with toil under the direction of another, so of course there was popular unrest under feudalism. Humans evolved to toil with purpose and autonomy, so of course there is widespread disdain for modern work and its purposelessness.

Of course, not all of these problems can be fully explained by a mismatch between human nature and civilization, and usually noting the mismatch alone does not adequately deal with the nuance of the problems. For example, black revolt in the US is more effectively spoken of in a "higher-level" language, such as by noting the heavy-handedness of police forces. There is usually no need to speak of these things in terms of "mismatch," just like there is usually no need to explain World War II in terms of biology and, to an even lesser extent, chemical reactions. Still, the higher-level language suited to these issues must operate in the context of ecology, so claims like "prejudice and xenophobia are purely a result of hierarchical social structures," which contradict the base ecological understanding, would not be viable. Imagine a history of WWII that contradicted basic ideas in physics.

Furthermore, the base ecological understanding of human nature and nature generally sheds light on historical events that would otherwise be obscured by the progressives. Consider again the conditions of black people in the US. Much, though not all, of the contemporary conditions are residual effects of slavery. And although all major civilizations have been built on slavery, it is clear that the Transatlantic Slave Trade was slavery of a much higher magnitude and rather different quality than any previous form. It was precisely this new intensity that permitted and some say spurred on the Industrial Revolution, since it was the

mechanism by which the resources and capital necessary for industry were accumulated, and since the capital it generated financed much of the revolution itself (Williams, 1944).

The trade required use of black bodies for labor and economic production, and its justifying narrative was that blacks were as savage as the nature they were pulled from, and just as nature was there to have productivity squeezed from it, so too were those people whose faces were veiled in black. Though there are many instances of this narrative, consider the *Pro-Slavery Argument*, a pamphlet published in 1853, which contended that "slavery has elevated the Negro from savagery. The black man's finer traits of fidelity and docility were encouraged in his servile position."

Of course, human nature being what it is, a rather vast infrastructure had to be developed to "fill in the gaps" and keep these individuals productive, such as slave-catching forces. Furthermore, contrary to popular narratives, this infrastructure wasn't always the extremely brutal and bloody narrative modern individuals learn of and wonder, "How could that have lasted so long?" Rather, it was a mix of the brutal and bloody, the pleasant (for incentives), and the mundane (Fogel & Engerman, 1974)—that is, it is just what one would expect from an infrastructure designed to extract resources and capital from human bodies with a human nature. These economic conditions merged with human nature's propensity for in-group/out-group divisions, and the results were white supremacist ideologies and racial progress narratives.

This association between blacks and savagery has carried on into contemporary times. For example, a major component of the Central Park Five case, where five black boys were falsely convicted of gang rape, was hysteria over "wilding," a term that referred to rowdy boys roaming city-streets to terrorize residents (Mock, 2014; see Figure 2). See also the examples given in section III.D.9, "Race, Eugenics, and Social Darwinism." This kind of rhetoric isn't entirely surprising, since it truly was not that long ago since slavery ended in the US. The primary way these residual effects show, however, is not through overt prejudice or ideology; to the contrary, most of the ideological and institutional centers of industrialized nations preach a left progressive narrative. Nevertheless,


TERROR IN CENTRAL PARK: *VICTIM HAS 50-50 CHANCE*

'WILDING' TEENS HELD IN RAPE

7 are called part of wolf pack

Seven teenagers were charged yesterday with brutally raping and nearly killing a jogger during a crime spree in which nearly three dozen youths roamed Central Park "wilding" — randomly attacking anyone they found.

Figure 2. Headline from the Central Park Five case.

many structural biases against blacks still exist, and many, though not all, black communities, which remain largely separate from white ones, still do not have adequate institutional forces to fully ingrate them into industrial societies.

DuBois argued repeatedly in his writings that slavery and other aspects of European domination kept blacks from developing their own contributions to global civilization, and that a great moral failure of Emancipation was its aftermath: "I insist it was the duty of some one to see that these workingmen were not left alone and unguided, without capital, without land, without skill, without economic organization, without even the bald protection of law, order, and decency" (DuBois, 1909). And although he saw the appeal in believing that harmony between whites and blacks could happen quickly, he argued that first the black race would have to develop its own capacities, "its particular message, its particular ideal, which shall help to guide the world nearer and nearer that perfection of human life for which we all long…" (DuBois, 1897) With these politics in mind, he started the NAACP, along with many other projects, and has truly had an unsung but profound influence on black politics. However, DuBois was a humanist, and strove for the ideal of universal solidarity. As such, he never challenged the idea that the black person had to be improved, and instead strove for this kind of progress.

Much data supports his conclusions about the failure of Reconstruction. For example, Pinker (2011) notes that homicide is much higher among blacks than whites and higher among southerners than northerners, suggesting that a huge reason is these populations' "culture of honor." This is an indisputable fact among

those who study homicide. However, Pinker is a humanist as well, so implicit in his overall argument is that effort should be made to improve these communities, since honor cultures are dangerous for the development of industrial civilization, and lead to more violence. These things are both true, of course.

To be clear, this is not an argument that these higher rates of violence are rooted in biological racial differences. Human nature is astoundingly unified, and rates of violence are much higher in some white populations as well, although usually not by virtue of their being white, mostly because their history did not include anything akin to the Transatlantic Slave Trade.

The problem, then, is that not all black people have been sufficiently integrated into industrial civilization, and because of these lack of institutions and overall integration, the "second nature" (which is cultural, not biological) that Elias argued had been developed in Europeans has not fully reached all black populations. The "second nature" that African slaves did have was of a foreign, non-European kind, and at the time existed only in the context of the agricultural civilizations that many Africans came from. Then, rather than being sufficiently socialized according to European standards, slavery stunted the "development" of further generations, as did the inadequate response after Emancipation. The latter is also why the South in general still has a "culture of honor."

Thus, poorer blacks are revolting today in places like Ferguson, Missouri. They, like most in industrial society, experience an underlying unease with modernity, and they experience all the same psychological problems it causes in human beings living in it. But unlike many other humans in these conditions, they are not "plugged in" quite well enough for the media, schools, and so forth to quell their revolt. And again, this is not racial in a biological sense. Black people who have gone through the socialization process, like university students, revolt in a manner one would expect from the highly educated and privileged, because, again, all humans are united by a common human nature, and only because of history have a large portion of blacks been excluded from industry.

Of course, from these conditions there are two options forward. On the one hand, the left's demands will "develop" poor blacks by giving them avenues into industrial society, such as through a toothless and artificial "black culture," with any elements dangerous to industry removed. On the other hand, those who wish not to be subject to socialization and development might revolt against industry and its ideology. Similar kinds of explanations apply to the industrial underclass, the third world, natives, and others who have not been sufficiently integrated into industry.

The role of left humanist movements is to coopt the unrest of the many excluded classes and declare it an expression of dominant humanist values. This is the progressivist's trick. An important characteristic of the oversocialized element that does this is an almost neurotic empathy for victims or perceived victims, which helps justify solidarity beyond relations and which functions as a sort of "detection and response system" for identifying non-integrated populations (see, e.g., Singer, 2000, p. 9). But for a wildist to give historical explanations is not or should not be an exercise in this neuroticism; rather, it is and should be an expression of intellectual nuance, or the ability to note that some more than others have been integrated into industrial society. To recognize this is intellectually honest, strategic, and to the benefit of those of the excluded who value wildness and seek freedom rather than a pathway for "development."

A related note of caution: many have noted the prevalence of "cause-junkies" among the left. In truth, this is a tendency present in many mass movements, a side-effect of industrial alienation. In all of these mass movements, however, the cause-junkies are directed by an ideological force. In the case of, for example, the Islamic State, this force consists of religious theologians. In the case of the left humanist movements in industrial nations, this consists of an oversocialized population from the technician class, university professors being an especially notable example. Hoffer (2011) writes extensively of this phenomenon of the alienated masses and their ideological directors. Many of these alienated individuals are head-strong and young, and they are helpful only if their unrest can be directed to a single cause. Otherwise, they are loose cannons and ought to be avoided, especially because their lack of discernment dilutes movements. Keniston's (1974;

1968) work on the New Left demonstrates this problem well. Also see Lee's (1995) account of the schism in Earth First! after it was overrun with left-wing activists.

So even if the conditions of blacks, natives, and others are partially or largely explicable in terms of domination over nature, by bringing this up we cannot succumb to the temptation to forget about our core concern, namely, nature's wildness. This temptation is especially strong in a society that values indiscriminate empathy for victims or perceived victims (Último Reducto, 2009). That is, when the goal is integration into industry and development of these populations, it makes sense to have separate political causes, because each can progress more or less separately. But industry's scale has made it such that no person can be free until its stronghold has been weakened and, ideally, terminated. The role of the above is exclusively to challenge the left humanists' assertion that they are on the side of the oppressed. As we have seen, they are only trying to "develop" the excluded into properly functioning elements of civilization, glossing over the sources of their unrest by "plugging them in" to universities, the media, and the larger culture, but not freeing them from the fundamental source of that unrest, namely, the technical domination of their nature.

7) Does Artifice Have Value?

The primary concern of wildists is the autonomy of nature. Thus, the value of artifice is of secondary importance. Nevertheless, while wildism by itself does not fully answer the question of the value of artifice, it does place clear limits on said value.

Recall that the primary issue is that cultural evolution has outpaced biological evolution. The focus, then, is on reappraising the value of the non-artificial in order to potentially end our immoral domination of nature, which has meant the extinction of thousands of species, the loss of most of the world's wildlands, climate change, and many other grave consequences. Still, discourse that divides "artificial" and "natural," with an emphasis on shifting back toward "naturalness," is most relevant in big-picture social contexts. When it comes to personal or extremely small-scale contexts, the distinction becomes, perhaps, less morally relevant, especially because a large part of the issue with the dominance of artifice is its scale and perpetuity.

Furthermore, specific cultural artifacts clearly have some kind of value, if only aesthetic. Music and art that could only be produced by complex civilizations are the most obvious examples. Certain kinds of access to knowledge, such as through library systems, are particularly strong arguments for me. Some friends have noted the aesthetic beauty of city skylines. But always the question is whether these things are worth their price. Certainly slavery produced some things of some kind of value, such as the pyramids or various aspects of Roman civilization. This does not, however, justify slavery.

Ultimately, this question easily turns into the same endless argumentation that we avoided earlier, when it was established that the onset of civilization was a significant benchmark in relation to the question, "How much wildness?" That was decided because discussions such as this could become similar to problem of when cells become a person in the abortion debate. Thankfully, at least our problem is simplified by several orders because, unlike the development of the zygote into a baby, the benchmarks from primitive humans to now are rather clear expressions of changed human-nature relationships. So to avoid endless debate, wildists simply state that wildness has value such that civilized agriculture and industry are morally condemnable (along with their intermediate productive stages). Thus, to make things simple, we might say that artifice never matters so much as to excuse the damage done after that cut-off point of civilized agriculture.

All that said, my deepest desire is to see the conversation on the value of artifice abandoned. Given that the whole machinery of industrial society expends perpetual effort on reaffirming the value of human endeavors, the small number of wildists, with their limited influence, would do well to spend their energy reaffirming the value of nature regardless of what this means to human artifice. Although such an attitude may not be appropriate at all times and in all places, it certainly is in this age of crisis. No doubt, the sheer depth and breadth of the power pushing the opposite

view of progress will ensure that some valuation of artifice will survive no matter how much of a purist position wildists take in defense of nature. For more on this line of reasoning, see Hunter (1996), and for related but potentially more fruitful questions, see Hettinger (2002; 2012).

8) The Bad Parts of Human Nature

What about the bad (or "bad") parts of human nature? Isn't it true that, just as you can't have the good parts of technology without the bad, you can't have the good parts of human nature without the bad either? Indeed, this is true.

Earlier I mentioned that evolutionary game theory predicts that a consistent portion of the human population will be psychopathic. One might wonder how this is worth conserving. Remember, however, that wildists do not claim that nature is good, only that progress is a myth. In fact, it would be absurd to call many aspects of nature "good," but a big-picture perspective clearly does establish that nature has value.

To leave the case of human nature for a moment, consider the mosquito. Many individuals, seriously and as a joke, insist that the mosquito should be eradicated. Quammen (1981), however, challenges the wisdom of this view, noting that the insects "make tropical rainforests, for humans, virtually uninhabitable." If you're not sure why this could be a good thing, perhaps you don't know that rainforests hold nearly *half* of Earth's terrestrial species, yet are in deep trouble because of industry and agriculture. Writing in 1981, Quammen explains:

> *The current rate of loss amounts to eight acres of rainforest gone poof since you began reading this sentence; within a generation, at that pace, the Amazon will look like New Jersey. Conservation groups are raising a clamor, a few of the equatorial governments are adopting plans for marginal preservation. But no one and no thing has done more to delay the catastrophe, over the past 10,000 years, than the mosquito.*

Essentially, the problem is that when humans clear the vegetation, mosquitoes come down from the canopy and attack, bringing disease with them. The rainforests, writes Quammen, "are elaborately booby-trapped against disruption." He then notes that native forest peoples eventually became immune to some diseases and developed hunting-and-gatherering technics that minimized any run-ins they might have otherwise had with the canopy-dwelling insects. But colonists, out of place technically and biologically, were still vulnerable, and in West Africa, rainforests came to be known as "the white man's grave." Thus, while humanity has colonized most places on Earth, rainforests remained, until recently, relatively untrammeled.

Yet progress marches on, and in recent years, Oxitec, a biotech company, has genetically engineered mosquitoes with an "assassin gene" that eventually kills off mosquito populations. Already they've run successful tests in Brazilian cities and are set to be released in the Florida Keys. Brazil has also considered releasing populations of GM mosquitoes in preparation for the 2016 Olympics (Kitamura & Khan, 2014). As this kind of technology develops, it's not difficult to see a future where mosquitoes truly have been eradicated.

Note that this is all being done in the name of "fighting disease," and remember the earlier mention of medical science as a humanist ethical science. But even fighting disease is an example where the "bad" parts of nature might actually end up having some big-picture value. For although our efforts to eradicate disease have been fairly successful, they and the technical infrastructure they are built on have most likely traded small, inconsequential outbreaks for one or more extremely large ones (Quammen, 2012; Garrett, 1995; World Health Organization, 2014). Not to mention disease's role in checking population growth. In other words, even though one can hardly call malaria or smallpox "good," it might not be wise to call eradicating them "good" either. See Ehrenfeld (1981, p. 209) on this point.

The same logic should be applied to human nature, so long as it is understood that humans are, as Darwin, Wilson, and others have established, apes, albeit apes with pants. As stated earlier, if the problem is "unlinked" cultural evolution, and if this applies to our Stone Age biologies as much as it does to non-human nature, and if it is clear that cages and domestication leave animals worse off, and if there is evidence that the same applies to humans, then what, other than the

old story of human exceptionalism, is keeping us from coming to the obvious conclusion?

Nevertheless, this is likely a necessary but not sufficient argument for conserving human nature with its "bad" parts, because some elements so thoroughly offend modern sensibilities. If we are serious about equating human nature with non-human nature in the significant sense that we do, we ought to face up to these negative elements, which include the following: **violence**, and I meant *violence* (e.g., Chagnon, 1997; Pinker, 2011; Daly & Wilson, 1988), **cannibalism** (Roach, 2003; Stoneking, 2003; Sugg, 2013; but see Routley, 1982), **various non-PC sexual dynamics** (Buss & Schmitt, 2011; Barkow, Cosmides, & Tooby, 1995, pp. 249-326), **natural propensities toward criminal behavior** (Rice, 2013; Wilson & Herrnstein, 1985), **psychopathy**, **rape** (Thornhill & Palmer, 2001), **prejudice and xenophobia** (Reynolds, Falger, & Vine, 1987), **infanticide** (Daly & Wilson, 1988, pp. 37-89), and probably some others I'm neglecting to mention.

I'll address a few here. Consider again psychopathy and anti-social personality disorder. For now let's ignore some of the potential reasons to be suspicious of the role of "personality disorders" in medical science (see Bradshaw, 2006). I wish only to stress that the implications are rather clear for individuals who wish to challenge dominant values, including and especially those normative postulates that drive medical science—which isn't to say the empirical findings are incorrect, since they are often irrefutable.

But, at least right now, progressives cannot argue that industry better guards against psychopathy. Psychopathy may, in fact, be rather well-suited to it. According to one industrial psychologist and an expert on the illness, upwards of 1 in 25 business leaders could be psychopathic (Babiak & Hare, 2006). Similar kinds of arguments apply to crime. Often the behavior that is called criminal is that which is not conducive to the technical system, which isn't to say that it is excusable or good, but that other kinds of crimes committed by the upper class are ignored, especially difficult to detect, or especially difficult to prosecute (Sutherland, 1983).

Also consider the various arguments stating that violence declines as civilizations develop. Pinker's (2011) is the most famous, but much of his book simply consolidated the work of others, like Daly and Wilson (1988), Mueller (1990), Keeley (1997), and the Human Security Report Project (2013). The empirical argument is convincing, but the normative argument should at least be questioned. By no means can I argue that the magnitude of violence present throughout human history and prehistory is desirable, but I do question the value of eradicating violence completely. Even the present levels are of questionable benefit, especially in universities, which are the keepers of society's dominant values, but also home to professors and students pathologically averse to violence, calling even "microagressions" a form of it and truly perceiving them that way (Campbell & Manning, 2014). Lorenz (1963) writes that the result of this pathology is a society in which there is "no legitimate outlet for aggressive behavior" (p. 244) arguing that "innocuous outlets" must be constructed. But do we truly desire such a constructed environment meant to develop, direct, and hone our desires? At what point does this become unacceptable? And where, in any of these options, can we find freedom?

Furthermore, Pinker often notes side-effects of the very technologies and institutions that are the probable cause of various declines in violence. A pertinent example is digital communications technology, the likely source of the new wave of "rights revolutions," as he calls them, but also a primary reason no person intuitively believes they are living in less violent times. Basically, the "if it bleeds, it leads" mantra that runs the media means we humans are constantly inundated with news of violence. This combines with our mind's "availability heuristic," mentioned earlier (section II.C.3), and we become convinced, unconsciously or not, that because we can easily recall instances of violence, there must be a lot of it. Islamist terrorists are effectively exploiting this tactic now, and the result is constant anxiety, despite the trend toward peacefulness. Of course, there are possible solutions, but I can't think of any that sound appealing. Is the media going to become regulated so that just the right amount of good news enters our brains to improve our "well-being"? Huxleys and Orwells of the world, take note.

All that said, there is one item on the list that is truly unsettling: rape. And there's good reason for the feeling. Rape *could* be what in evolution is called a "reproductive strategy." This theory is not conclusive, but it is a fairly well-supported one (Thornhill & Palmer, 2001; McKibbin, Shackelford, Goetz, & Starratt, 2008; Shields & Shields, 1983; Thornhill & Thornhill, 1983). Once again, recall that "natural" does not mean "good." It also does not mean "inevitable." In fact, where rape is present, so is retaliation against it, and societies universally have norms or laws against rape (Shields & Shields, 1983; Palmer, 1989). The only exception is the rape of wives, which until recently was not prosecuted even in industrial nations (McKibbin, Shackelford, Goetz, & Starratt, 2008). It seems that, since rape would be most likely in circumstances where the potential price is not too great for the male, such as in times of war, and since both Paleolithic women and their families would have been effected by the outcome of a rape, certain psychological propensities, like revenge, and possibly social norms, evolved in order to combat it, decreasing the possible reproductive advantages for males (see the above sources).

Still, it is possible that rape declines with industrial and economic development. Pinker offers some weak data that is unconvincing on its own, but in the context of declining violence in almost every other area, it is worth considering. In contrast to Pinker, activists contend that levels of rape are profound and that current infrastructure is woefully inadequate, which would indicate that reducing the stronghold of industry would not make much of a difference, since even primitive methods of dealing with rape would be a step up. Probably, though, Pinker is more correct, and there are some indicators of this. For example, consider Zentner and Mintura's (2012) paper, entitled "Stepping Out of the Caveman's Shadow," in which they noted that the more developed a country is, the more divergent its men and women's mate preferences are from those predicted by evolutionary psychologists. Instead, men and women become more similar in their mate preferences.

In other words, the likely status of women in a less developed economic world will probably be at least as powerful an argument against decreasing industry's stronghold as eradicating disease is. I can't pretend that this isn't an issue, and it is a point that ought to be addressed more fully in the future.

I'll leave the other elements on the list for now. I wish only to point out that in nearly all of these cases, the bad (or "bad") parts of human nature are sideshows, and as a critique against wildism they cannot stand alone. For could I not name many ills associated with industry's domination of nature, most of them several orders more impactful than any problems humans could have merely among themselves? I cannot help but note the ills of climate change, rapidly increasing population growth, the threats of genetic engineering, the impacts of roads, the massively increased rates of extinction, and the fundamental unrest of all human beings, and then I cannot help but challenge any individual to come up with an approach to these problems that does not in some ways have unsettling implications. Clearly, this is impossible, and in a reasoned assessment of what we can do from where we stand, we would do well to admit that we are, unfortunately, in a time where the best we can hope for is the least damage done—and this is no fault of the wildists.

9) Race, Eugenics, and Social Darwinism

This talk of "conserving human nature" should be a red flag for readers familiar with conservation history, since within the "resourcist" faction of the conservation movement, similar ideas equated to or were closely tied to "race conservation." Before I review the history, however, let's establish what the science is concerning race and biological human variation.

a) The Science of Human Variation

There is biological variation within the human species, including at the population level (see, e.g., the Human Genome Diversity Project). The most obvious examples of this are skin color, eyes, lips, and so forth, the differences in all of which are mostly due to climactic adaptations. But many people do not know that genetic data alone can reveal a person's geographical origin, "often to within a few hundred kilometres" (Novembre, et al., 2008), and the probable racial category the person identifies with. One can also usually determine the latter from bones alone (Brace & Gill, 2000). Furthermore, some populations genetically tied to a geographical area are more prone to diseases than other human populations, such as Tay-Sachs disease

in Ashkenazi Jews, sickle-cell anemia in African Americans, and cystic fibrosis in Caucasians.

Whether variation such as this amounts to *racial* differences is a matter of controversy, although the debate is bogged down by semantics. Suffice it to say that there are good and scientific arguments for the usefulness of race in biology, even if the counter-arguments are also reasonable (Risch, Burchard, Ziv, & Tang, 2002; Witherspoon, et al., 2007; Edwards A. , 2003; Brace & Gill, 2000; Hellenthal, et al., 2014; Wade, 2015, but see below; and several others).

Note "usefulness" rather than validity. Although "race" at one point was a taxonomic level lower than "subspecies," now the two are considered equivalent. However, "subspecies" is an amorphous concept, and in animals the definition is usually something like, "a population within a species that occupies a distinct geographical region and shares one or more distinct features." For example, Yellow-rumped Warblers, with yellow throats, and Myrtle Warblers, with white throats, were once considered distinct species because of differences in appearance. However, when it was discovered that the two "species" mated, they instead became considered two subspecies. Genetics and evolutionary theory have since complicated these schemes, but the concept of subspecies, in general and in relation to humans, still conveys useful information in conservation, forensics, medicine, evolutionary history, and so on. In recent years, a genetic concept of race has gained legitimacy especially in the medical field, where the humanistic concern of eradicating diseases is slowly winning out over other ethical issues (e.g., Risch, Burchard, Ziv, & Tang, 2002).

This should shed some light on research dynamics in the era of "scientific racism." Consider, for example, the recent case of Nicholas Wade's *A Troublesome Inheritance*. Wade's book argues that race exists biologically (the first part) and then that race was an important component of major events in history, such as the dominance of the Western world or the transition to industry (the second part). Several reviews noted that the science of the first part of Wade's book was largely correct. After that, however, Wade begins arguing for racist ideas that are almost entirely speculative and that go way beyond the facts.

Here's the thing, though: Wade repeatedly said that his ideas were speculative, and normally in science, this kind of hypothesizing is quite acceptable, a necessary step that is then countered with experiments and more data, and then revised. Strictly speaking, Wade's ideas aren't *necessarily* wrong. However, we can't forget that Wade operates in the context of a nasty history, and his arguments could have social implications that would be hard to undo if that step after the hypothesis phase—experimentation and data collection—refutes his initial ideas. So goes the argument of people against Wade's book, and I am fairly sure I support some soft version of it. Wade, a science journalist and popularizer, was being irresponsible. Furthermore, it is undeniable that some, though not all, of Wade's "hypotheses" were influenced by racist notions, unconscious or not, rather than being reasonable extrapolations from available data.

Even though there were a great many preposterous tracts of pseudo-science, many of the ideas that come from the era of "scientific racism" were like Wade's, and in that light it's hardly difficult to understand how that era occurred. As the theory of evolution gradually started being applied to the human animal, it mixed with prevailing values and produced rather horrendous results, especially where scientists' ideas spread into the area of policy and politics, where they were not bound as tightly to data. But the problem is not the science; the problem is the prevailing values.

b) Conservation and Eugenics

No one embodies the nasty aspect of conservation history more than Madison Grant. One of the most influential figures of the conservation movement, Grant was also a major proponent of eugenics. In fact, he is well-known among those on the racist far right as the author of a book entitled *The Passing of the Great Race*, in which he argued for the conservation of the "Nordic race" responsible for civilization. Hitler sent him a letter of admiration for it, calling it "my bible."

Gifford Pinchot is perhaps more unsettling simply because he was even more connected to power than Grant. Pinchot was the founder of the "resourcist" faction of the conservation movement and a great friend of Teddy Roosevelt. He and the president were leaders of the Progressive Era, and Pinchot often attended international events as a representative of the US. One

Figure 3. Ota Benga at the Bronx Zoo in 1906.

such event was the Paris International Exposition of 1889, which included a "negro village" as an exhibit. This was quite common with world fairs, meant to encourage and put on display the new world that technical innovation had created, such as communities united by national symbols instead of symbols of small communities. In fact, "human zoos," as they were called, were especially popular from the 1870s up until World War II. Keeping with this rich tradition, at one point, Grant had the director of the Bronx Zoo (which he had founded) put the Congolese Pygmy Ota Benga on display with the chimpanzees, labelling him "The Missing Link" (see Figure 3).

Wohlforth (2010) and Rydell (1987) explain all this and more, and I encourage readers to investigate their works for greater detail. Suffice it to say, there is a reason Darwinism has a bad name.

c) The Anti-Industrial Left

Darwinism, however, was not to blame. Rather, the conservation ethic espoused by Grant, Pinchot, and Roosevelt was an intrinsic part of Progressive Era policies, with their great faith in human reason and technical development. No document better expresses this than a report put out by the National Conservation Commission entitled "National Vitality, Its Waste and Conservation." It covers all the basic causes of the progressive movement, from improved worker conditions to restaurant inspections. It also advocates eugenics and a national program for "race hygiene." In other words, eugenics was an element of the progressive left that now decries it. In fact, many of today's family-planning organizations, like Planned Parenthood, were started as eugenics projects.

To really rub this point in, consider that the names who have supported eugenics over the years include Theodore Roosevelt, Hellen Keller, Winston Churchill, Woodrow Wilson, Henry Ford, John Rockefeller, Andrew Carnegie, Herbert Hoover, George Bernard Shaw, H.G. Wells, Francis Crick, Margaret Sanger, and Alexander Graham Bell, among many, many others.

This is not because the science suddenly made everyone terrible, or because the science was wrong. To the contrary, the science of eugenics is basically correct. But its correctness is precisely the issue, as it enabled the prevailing values of progress and faith in human artifice to be enacted with devastating precision.

But technical progress moved too fast, and there was a backlash from the left itself. It had been forming for several years, but by the 60s it burst onto the scene in full force as the "New Left," primarily a result of disillusionment after two world wars, catalyzed by the Vietnam war, and reinforced by the anxiety of the Cold War. The "New Left" saw itself in opposition to the "Old Left," and in reaction to what they saw as class reductionism, they stressed gender and race issues, emphasized non-hierarchical organization, and focused on "lived experience" rather than scientific analysis.

Their revolt, rather than being against dominant values, became instead a revolt against science, reason, and technology, which they saw as the root of the evils that were just reviewed, as well as new issues like the massive weaponry utilized in World War II. Out of this revolt against science and reason were borne cultural phenomena like Woodstock, postmodernism, and a resurgence of non-classical forms of anarchism, specifically with a focus on the "primitive" and a new myth of noble savagery that presumes humans originally lived in left-wing paradises that became despoiled by institutions. Thus, left-wing movements became hypersensitive to institutional failures and developed the highly responsive "detection and response" element mentioned earlier. The left became a reaction to itself.

As a result, today we have individuals who espouse left humanist values but who profess to be against progress and "leftism" (the Old Left). Rand (1971) called these individuals part of the "anti-industrial left." These are the same individuals who exhaust everyday folk with their perpetual allegations of racism and sexism, and who no doubt will see this entire text as anti-woman, a polemic for race realism, a tirade against uncivilized blacks, and driven by a desire to see starving, savage Ethiopians die cruel deaths.

These individuals may fall into three categories. First, they may be the oversocialized, who have internalized dominant values so thoroughly that they rebel as a psychological release, but only in terms of the values they cannot let go of. Second, they may be the alienated, a large portion of normal individuals who are simply uneasy with modernity and need an outlet that the oversocialized provide for them. Third and finally, they may be individuals with an ethic similar to or the same as wildism, perhaps also alienated, shocked and angered by the history of technical domination, but driven to the left because it seems the only option. But it is not the only option.

d) Biodiversity versus Wildness

In fact, Pinchot's conservation has nothing to do with wildism. Always in the movement there have been two ethics, completely at odds with each other, one accenting the conservation of nature for efficient resource use, the other conservation of nature for its own sake. At the time of Pinchot, the latter was expressed by John Muir, who worked diligently to establish Yosemite, founded the Sierra Club, and saw himself as a sort of John the Baptist who was to submerge into the wilderness those who wanted renewal. Although at one point Roosevelt established a pact with Muir to set up the national parks system, at the end of Roosevelt's presidency Muir was betrayed. A dam, which Pinchot campaigned for, was set to violate the autonomy of the waters of Hetch Hetchy Valley, and despite Muir's pleading to Roosevelt, Pinchot's views won. The plans for the dam were signed into law, and Muir died a year later.

But while Muir is an inspirational figure, more important is the idea he preached and represented: *wildness*. As he put it, "Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home; that wildness is a necessity" (1901). Contrast this with Grant (1909), who argued that man now has "complete mastery of the globe… On this generation then rests the responsibility of saying what forms of life shall be preserved, in what localities, and on what terms."

Thus, when we speak of human zoos and eugenics and feel that gut-wrenching disgust, we have a perfect illustration of the ongoing moral crisis that wildist conservation is concerned with. We are repulsed by eugenics, the management of human nature, because it is a violation of due autonomy. This same disgust is warranted for any proposal that will have biodiversity at the expense of wildness, that speaks of management without respect for nature's autonomy.

The New Left, then, has made a grave mistake. In choosing to eschew humanity's best method of understanding the world so far, they have made themselves impotent as an anti-industrial force, and, worse, by revolting in the name of their society's own values, they've become a vital self-correcting force for that same society. Yet, they may be fading away. Slowly, the left is transforming into a pro-progressive force again, a change spearheaded by thinkers like Singer and Pinker. Along with this change comes with an emphasis on harnessing human nature with advances in biotechnology, which Wilson (1978) has damningly envisioned as a "democratically contrived eugenics." One can clearly see efforts to conserve the biodiversity of human nature, perhaps after a first attempt at genetic engineering goes wrong and leaves us rather homogenous. (In fact, Wilson asserts that we ought to preserve the biodiversity of human nature until we have greater knowledge for his eugenicist vision.)

That said, these thinkers—Singer, Pinker, Wilson, and the others—do not deserve the charges of racism and sexism that activists have thrown at them. And Wilson in particular has contributed much to conservation, sometimes inconsistently jumping between a resource-use ethic and something akin to a deep ecology ethic. But even so, the man and the others are playing with fire that might quite literally consume the whole world.

Interestingly, Wilson's combined contribution of sociobiology with his ideas on genetic engineering

echo the character of B.F. Skinner, who in the 1970s contributed his theory of behaviorism and later wrote, in a book aptly entitled *Beyond Freedom and Dignity*, "A scientific view of man offers exciting possibilities. We have not yet seen what man can make of man."

Skinner's theories are now either discredited or humbled more than he would have liked, but Wilson's will likely persist. Biology truly is the science of the 21st century, and now is unavoidably an age of biopolitics. Thus, rather than rejecting science, we must recognize the capabilities of this great way of knowing and challenge the values that justify its technical nastiness. This is a much stronger and more lasting approach than that of the anti-industrial left, and it has the advantage of being true in its ideas. Ultimately, however, the conflict will only be resolved in the hard, material world, with a change in technical and economic conditions that will either mean a permanent reduction in the extent of man's violation of wildness, or, hopefully not, but perhaps, a permanent end to human nature.

E. Anti-Industrial Reaction

With these foundations set, there is that most pressing question, "What is to be done?" It cannot yet be fully answered, but figuring out the answer is a primary purpose behind The Wildist Institute. Among them, one of the most viable is the idea that it is a moral obligation to disrupt industry beyond repair, to the extent possible. This would essentially be an anti-industrial reaction to the Industrial Revolution.

Although many upon hearing this idea find the most pressing question to be whether or not such a goal is possible, this is one of the least important considerations. Civilizations are rather fragile things, and focused groups can, in the right circumstances, be rather powerful ones. Furthermore, like they always do, the levees will eventually break. The histories of various revolutions and collapses support these points.

Another common response to the proposal is questioning whether collapse is the only way out of our ecological troubles. Indeed, upon initial consideration it makes sense to consider other hypotheses, and one new hypothesis, that late industrial technology can decrease human impact, is worth at least considering for the sake of thoroughness, even if it is probably untrue, and would entail forsaking the conservation of human nature. Investigating this idea's veracity and viability is one short-term task of the institute.

However, collapse is almost undoubtedly a necessary aspect of ecological conservation and restoration. Consider, for example, the environmentalist assertion that we must decrease consumption and production. Historically, this has happened no other way than collapse (or depopulation, such as with the Black Plague). Or consider the idea that we must decrease carbon emissions. What civilized solution has worked? Many eminent scientists have noted how woefully inadequate the solutions so far have been (Milman, 2015; Edwards L. , 2010; McKibben, 2012), and according to one study, one of the only places that has decreased carbon emissions at an adequate speed, Syria, has done so because of large-scale infrastructural turmoil and associated demographic changes (Lelieveld, Beirle, Hormann, Stenchikov, & Wagner, 2015). Another study points to the decline in emissions during the 2008 financial crisis, but then a rapid increase that "more than offset…the decrease" as economies started to recover and developing economies grew (Peters, et al., 2012).

Since collapse is almost certainly our way out, those at the institute will be spending more time exploring things like whether there is a difference between waiting for collapse and aiding it, or whether rapid and aided collapse would do more damage to nature than unaided collapse, or whether it is even wise to engage in a revolutionary-like politics in the first place, especially given the wildist awareness of human folly. There are numerous other considerations, but it is sufficient to say that, given the consequences of such an idea in practice, real and effortful thought must be put into it.

Nevertheless, more modest but still radical anti-industrial action is undoubtedly necessary and a moral obligation. Given the above ethic, something akin to the early years of Earth First! would be beneficial at this historical juncture. In particular, and at the least, ongoing efforts to expand and connect wildlands ought to be made reasonable with a radical non-institutional force. This would of course involve defense of existing wildlands, but perhaps the most effective efforts would include taking advantage of industrial or natural disasters that rapidly undevelop areas where wildlife

corridors would otherwise never be built. The fight for now would primarily be against redevelopment.

Such an effort would also establish an audience of people most receptive to the idea of an anti-industrial reaction, should one become obviously necessary over the course of our investigation. Otherwise, the effort would at least help jump-start the slow, ongoing transition to more proactive conservation work, which is strongly supported even by moderates.

F. Wildlands Conservation

The literature on wildlands conservation is vast, and most of what this synthesis would add to the discussion is strategic rather than ethical, discussions best suited for a later time. However, I do wish to make an ethical point about the so-called "wilderness debate."

The "wilderness debate" is a political fiction, and its name is a woefully inadequate descriptor of what has really occurred over the past few years. Given the value of nature, the importance of wildness, and the critique of progress, the necessity of wildlands conservation with an eye toward wilderness is uncontroversial. No one but the densest of individuals could fail to see how it unites all the threads of ethical concern noted here. Therefore, rather than a being a debate, it is much more an attack, albeit a skillfully maneuvered one. It deserves the charge of revisionism as much as Kareiva's recent polemics for the Anthropocene.

Other than that, the imperative of wildlands conservation is straightforward. As Abbey put it, "The idea of wilderness needs no defense. It only needs more defenders." This is the true resolution of the wilderness debate.

IV. SUMMARY

Let us briefly review the core ideas of wildism.

Sometime during his evolution, probably around the Late Paleolithic, man evolved the capability for creative, symbolic, reasoned thought. Thus, when the Neolithic arrived with agriculture and civilization, cultural evolution became "unlinked" from biological evolution and began to outpace it. Because of this, human and technical (i.e., artificial) objects or modifications of nature were not mostly supported by interacting natural systems, as before, and even began to destroy surrounding natural systems. For example, unlike making a spear, which requires little and only temporary input of artificial energy, animal husbandry is out of pace with nature to such a degree that it requires a great and perpetual amount of artificial energy input to "fill in the gaps" that nature can no longer fill.

As a result of this unlinking, there have been many consequences of great moral concern: anthropogenic climate change, increased rates of extinction, overpopulation, etc. And the Industrial Revolution, which unleashed cultural evolution to a profoundly greater degree than the agricultural one, worsened the problem with its roads, dams, carbon emissions, pollution, and intensified agricultural practices. Furthermore, just as cultural evolution has outpaced non-human nature, it has also outpaced human nature, the primary cause of our modern ills and a contributing factor for why we are unable to solve them. It seems that the only way to escape or delay this, short of the collapse of civilization, is to modify nature so that it can keep up. Those in support of this imperative, either in non-human or human nature, or both, advocate enacting it through new technologies such as genetic engineering, artificial intelligence, and the like. However, apart from being most likely impossible, this results in a profound loss of what *wild*ists value most: wildness.

It could be that the unlinking has made humans a non-viable species, meaning we will at some point die out, hopefully without taking too much of nature with us. However, the same capacity for creative moral and reasoned thinking *could* lead to positive responses to our problems. With this possibility in mind, we at The Wildist Institute have sketched a moral discourse and set of moral axioms to be applied to conservation science.

Central to this discourse is a divide between the artificial and the natural, that which is made or controlled by humans and their technical systems, and that which is not. Both are placed on either ends of a spectrum, and our normative obligation is to move the world closer to naturalness. We note that wildness, or the relinquishment of human control and the decrease of artificial energy input, is a defining and necessary step toward increasing naturalness. This is why collapses of civilizations have historically been beneficial to nature; it is why a freed population of domestic animals becomes feral and then wild; and it is why a river

ecosystem begins to be restored with the removal of a dam.

The best known way to measure artificial control on a social level is through modes of production, which function as mostly clear benchmarks for transitions in the artifice-nature dynamic. We argue that as a moral matter, and not necessarily as a practical matter, social systems at the civilized agricultural and industrial modes of production are morally condemnable.

In order to properly convey the moral importance of these ideas, wildists note the usefulness of borrowing traditionally religious concepts like sacredness, ritual, and the Sublime, and intend to take up the call for a religion of the Cosmos advocated or suggested by men such as E.O. Wilson, Christopher Hitchens, Carl Sagan, Einstein, and others. This will perhaps increase the effectiveness and preciseness of our moral discourse.

Many solutions have been posed for these moral quandaries, but wildism discerns between viable and non-viable solutions with its critique of progress. Mythologies of progress are civilized narratives united by a belief that human reason and ingenuity can improve the world, particularly the human condition, by artificially modifying nature. While wildists of course question the normative assumptions of progressivism, noting that technical solutionism justifies decreases in wildness, the most important challenge they make is to the "blueprint mentality."

The "blueprint mentality" is wrong on several grounds. It is wrong in that it assumes that (1) rational blueprints will be sufficient to solve the problem; (2) they will be enacted properly or at all; (3) that, when enacted, they will go as planned; (4) that, when they go as planned, they will not have unintended consequences. Chaos theory, various logical and mathematical limitations, and various practical problems suggest that 1 is mistaken and an insurmountable problem. Humans will simply never know enough to subject nature or their societies to rational human control. Furthermore, since it is humans enacting them, we can expect even good blueprints to be ignored, enacted improperly, or to suffer from various other problems that stem from the reality that man is not primarily a rational creature.

3 suggests that even if human do everything right on their part to enact the blueprint, this is rarely any guarantee that it will go as planned. The primary evidence in this regard is the concept of cultural evolution, a theory that states, among other things, that while man provides a "motor" for much, though not all, of technical evolution, the selection for various technical "memes" occurs on a level higher than human intention. Selection factors that prove more relevant and powerful than human intention include geography, demography, technology itself, economic factors, and so forth. To further illustrate this point, consider an UNO game where players count the points in their hand at the end of each round and add it to their point total. This game ends once one player surpasses 500 points, and the player with the least amount of points at that time wins the game. However, if a player has exactly 500 points, his point total returns to zero. Given this set of rules, players who have point totals very close to 500 may try to play the game so that their hand ends with just the right point value to return them to zero. But because of so many other factors—chance distribution of cards, decisions by others players, etc.—no amount of reason will ever be sufficient for the player to achieve his goal. Cultural evolution works similarly.

Finally, even if a blueprint goes as planned, which, given above, would be due to more than just human reason, and even if it considers all the knowledge that humans could have reasonably been expected to know while devising it, the blueprint is still bound to have unintended side-effects that, in the context of the narrative of progress, are always responded to with more technical solutions, which themselves have unintended side-effects. This results in a major loss of wildness, and some evidence suggests that, short of mythological technologies like cold fusion, this will always lead civilizations to collapse. Eventually, artificial energy input will simply not be sufficient to withstand changing natural circumstances, or it will not be enough to encompass all the problems that require ever-more energy input, bringing a civilization to the "point of diminishing returns" where it begins the process of collapse. This has occurred with every previous civilization and there is no reason to think it will not happen again with industrial civilization.

The critique of progress puts major limitations on what human beings can do in response to the current predicament. Large-scale technical solutions that propose new green energies, new industrial or post-industrial infrastructure, and other such ideas cannot be a viable solution for those who value wildness, and are unlikely to be a solution even for humanists who wish to mitigate environmental degradation for the sake of "human well-being."

Wildists also question the idea that humanists are concerned with *human* well-being. They note that humanism, rather than propelling technical progress, is produced by and justifies technical and economic conditions. Thus, the "human" of concern to humanists includes only those aspects of human nature that are conducive to the functioning of industrial civilization. This is why the emerging "scientific left" (or the "Darwinian left") advocates modifying human nature through genetic engineering, in order to make it accord with left humanist values.

Furthermore, this means that when left humanist movements profess to be on the side of populations excluded from industry, such a narrative, regardless of what individual members of the movement believe, functions only to justify "developing" and civilizing that excluded class, which often for historical reasons has been kept from the fruits of industry (although usually not agriculture). Historical examples include various victims of colonialism, the slaves and descendants of slaves of the Trans-Atlantic Slave Trade, the third world, and the industrial underclass or the "rabble."

When bringing this up, wildists note that it is only to delegitimize the claims of left humanism, and insist that several reactions to this critique ought to be guarded against. Notably, a core element of the character of left humanist movements is a hypersensitivity toward victimhood or perceived victimhood, which functions as a sort of "recognition and response" system to identify excluded classes, and which helps justify solidarity beyond "relations," a term for an individual's natural social group. Furthermore, because industrial society diminishes individual and small-group power, many individuals see psychological appeal in mass movements, and some of them become "cause-junkies" dedicated primarily to the thrill of causes rather than to the causes themselves, and especially undiscerning in the contradictions between various movements and ideologies. Thus, wildists insist that these individuals be guarded against, lest the critique of left humanism itself turn into a means by which left humanists can coopt wildism. The best way to avoid this is to maintain focus on a single, root cause of all the problems, which, wildists point out, is the tension between nature and industry.

Thus, it is clear that a major component of wildism ought to be wildlands conservation, which rather elegantly unites all the ethical threads mentioned into a single framework. Not only does it directly protect that which wildists are most concerned about, much of it can be successful within the context of industry, which means that even if the most radical implications of wildism fail to be enacted, positive work will come out of wildist efforts. Examples include the work of The Wildlands Project, which has come up with a system of megalinkages and reserves that, if properly enacted, could mitigate the extinction crisis, depending on how soon industry stops pounding away at wild nature, perhaps through collapse.

In fact, because of our critique of progress, and because of the myriad of evidence indicating the positive effects economic downturn has on nature, wildlands advocacy is likely only the subsidiary political desire to a much larger, defining one, namely, the collapse of industry. The primary work of The Wildist Institute is investigating the veracity of this idea. Are there alternatives to collapse, as the Anthropocene boosters suggest? What about nuclear weapons? Is there a morally significant difference between collapse happening and helping it along? All these questions and more will be the subject of intense scrutiny, and will undoubtedly have far-reaching implications.

V. CONCLUSION

The ideas outlined here are a result of only two years of study and discussions, so they are necessarily foundational rather than comprehensive. In fact, even a whole lifetime may not be able to produce a sufficiently comprehensive review. However, for a set of ideas that boasts such consequential conclusions, some

elaboration beyond foundations is necessary, with priorities so as to get to the most important questions first. With this in mind, a small group of wildists have established what is soon to be a nonprofit, The Wildist Institute. As it stands, we see research priorities in the following manner.

The overwhelmingly dominant concern of existing wildists is addressing the issues briefly covered in section III.E, "Anti-Industrial Reaction." Should it become obvious that aiding collapse is in some significant way a moral obligation, as I and a small group of wildists believe is probable, the focus of wildism would on the one hand become clearer, but on the other hand become more dangerous. Furthermore, the question itself is a burden when its repercussions are so great, and one of the main points of this piece, that human folly defines history more than human achievement, should add a certain flavor of skepticism and restraint to the ruminations. In this light, I personally recommend the American revolutionaries as a group for inspiration, given their open contemplation of human nature and its limitations, as well as the general wisdom with which men like Jefferson, Paine, and Adams approached their obligations.

The next major concern is solidifying and simplifying our critique of progress. It appears that this is almost entirely an empirical question, well suited to academic and scientific work, and should focus on synthesizing the knowledge of the sociobiologists with the cultural ecologists. Provisionally we at the institute refer to this synthesis as "biocultural materialism."

After that, the task becomes largely strategic, finding ways to insert wildist philosophy into academia, pamphleteering and doing journalistic work to convey the ideas to the general public, and dealing with major strategic concerns, such as the tension between the human and non-human in relation to industry, or the relationship between the possible anti-industrial reaction and wildlands conservation.

Finally, of course, is the result. The possible outcomes in the battle between nature and industry are astoundingly divergent, a great, epic story waiting to unfold. It is impossible to predict how it will go in more than a general way, but at least one thing is clear: the attacks from revisionists will only continue to increase. As I've written, for those concerned with nature's autonomy, the collapse of industry is almost certainly the only way out of our current predicament. Almost. But that "almost" is a big threat, especially when technology is moving so fast that the technician class can hardly convince the rest of us of the necessary change in values, leaving people like the editor of the *Journal of Medical Ethics* putting out statements like, "people have a moral obligation to select ethically better children" through genetic engineering—something that sounds like lunacy to large portions of the world.

Combined with the inevitably small and potentially large economic turmoil of the coming years, which could amplify the power of a focused group to enact change, the industrial elite has great reason to fear a popularly appealing and true ideology that poses a threat to the basis of their power and values. And revisionism is their most effective tool. Nothing destroys a movement more thoroughly than a band of individuals who pose as members and begin to divert the focus away from the original values.

Thus, I return again to the role of wildists in this time: to incite that revival so passionately preached by Muir, and to maintain the resulting fervor as the conscience of the conservation movement. This is how we guard the chances for a hopeful and wild future.

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The Fable of Managed Earth

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> *We must judge with more reverence the infinite power of nature, and with more consciousness of our own ignorance and weakness.... Why do we not remember how much contradiction we sense even in our own judgment, how many things were articles of faith to us yesterday, which are fables to us today?*
>
> — *Michel de Montaigne,* Essays, *1580*

Human civilization can thrive only in a healthy natural world. For at least two centuries, environmentalists, conservationists, and ecologists—greens—have, to their everlasting credit, made this point, showing that technology, for all its genius, will not last if it stands alone, damaging the natural world and disregarding the essential place of nature in our lives. Techno-optimism is a deeply flawed worldview—not only morally and ethically but also technologically. Yet in the midst of planetary-scale destruction, technology remains seductive; even some greens now proclaim the coming of a gardened planet,in which all nature is tamed, preserved, and managed for its own good by enlightened, sophisticated humans.[1] But these "neo-greens," or "ecological modernists" as some call them, are doomed to disappointment: The gardened planet is only a virtual image; it will never happen in the real world.

We do not need to be prophets to know that we do not have the technological ability to produce and sustain a smoothly running, completely managed Earth. Of the existing technologies that are supposed to service a managed Earth, it is easy to show that many don't work well now, and they will be even more prone to failure in a future without extensive natural systems to serve as emergency backup.

From a human perspective, planetary gardening can be divided into a number of critical management areas. These include: food production; energy production; global climate control by geoengineering; accident prediction/control/repair; restoration of damaged ecosystems; assuring water supplies; regulation of human population size; and the maintenance of cooperative working relationships among nations. I will concentrate on the first four, but the others are also critically important. All of these processes must interact smoothly; positive adjustment of one set of variables should not negatively affect others.

I. SUSTAINABLE FOOD PRODUCTION

Beginning in the 1940s, a technology that came to be known as "the Green Revolution" created enormous increases in crop production, primarily the grains—rice, wheat, corn, etc.—which comprise the bulk of our food supply. These increases were achieved by breeding dwarf plants that could respond to the application of synthetic nitrogen fertilizer by increasing their production of edible grain rather than growing longer stems and more leaves. The dramatic increase in food production brought about by the Green Revolution saved many millions of people from starvation. Yields of rice, the first crop to benefit from Green Revolution technology, increased as much as tenfold, and prices fell accordingly. Norman Borlaug, the geneticist who was the father of the Green Revolution, was awarded the Nobel Peace Prize for his achievement.

An essential feature of the new agricultural technology was the growing of grains in fertilized, irrigated monocultures—only one crop at a time in supersized fields. In these very large fields, the plants were more accessible to the machinery that applied not only the

[1] F. Pearce, "New Green Vision: Technology as Our Planet's Last Best Hope," *Yale Environment* 360 (15 July 2013).

necessary chemical fertilizer but also the newly developed insecticides, herbicides, and fungicides needed to protect the vulnerable crops from the insect pests, weeds, and fungi that thrive in monocultures. The big fields also allowed more convenient use of the irrigation apparatus that provides water to wash the fertilizer into the soil, and to water the dwarf crops, whose small root systems are less able than roots of traditional varieties to extract water from dry soils. The dramatic yield increases brought about by the Green Revolution peaked in the 1960s, 1970s, and 1980s. By the 1990s, it was becoming clear that yields, especially of wheat and rice, had started to plateau. Farmers around the world had achieved the maximum benefit that the technology had to offer. Lester R. Brown, then president of the Worldwatch Institute, wrote in 1997:

> *In every farming environment, where yields are increased substantially, there comes a time when the increase slows and either levels off or shows signs of doing so.... During the four decades from 1950 to 1990, the world's grain farmers raised the productivity of their land by an unprecedented 2.1 percent per year, but since 1990, there has been a dramatic loss of momentum in this rise.*[2]

According to *Vital Signs 2006–2007*, world grain production per person peaked around 1985.[3] A growing world population (a growth propelled, ironically, by the Green Revolution) needs more food, but supply is no longer increasing proportionally.

Nevertheless, people had become accustomed to the idea that technology would solve their food problems, and technology appeared to be about to respond. Genetic engineering of food crops rose to the fore in the 1990s and in the early twenty-first century. People hoped that genetically modified (GM) crops would end world hunger.

But the great increases in crop yields that were supposed to be the result of genetic engineering have not materialized, and they seem unlikely to do so in the foreseeable future. In fact, compared with conventional crops, GM yields have often decreased, and sometimes the quality of the GM seeds is poor.[4] Yet despite this mixed performance, by the beginning of the second decade of this century, the acreage planted to GM crops in the United States, Brazil, China, and other countries had increased substantially. This increase happened for a variety of reasons, some related to transient agricultural advantages of the new crops but another significant factor being the link between economic subsidies and the political power of the multinational corporations that produce the GM seeds. By contrast, the nations of the European Union and India have largely rejected GM crops out of fear of their biological and socioeconomic side effects.

At the time of this writing, the proponents and opponents of genetic engineering are waging a fierce battle, with victories and defeats on both sides. Genetic engineering is not likely to disappear, but its claims of potentially ending world hunger have no basis in reality; GM crops are not another Green Revolution.

What went wrong after forty years of the Green Revolution, and then, more quickly, with genetic engineering?

The Green Revolution has fallen victim to a host of intractable problems. It entirely depends on cheap energy to produce the synthetic nitrogen fertilizer; to

[2] L. Brown, "Can We Raise Grain Yields Fast Enough?," *World Watch*, Worldwatch Institute (July-August 1997): 8-17; see also F. Magdoff and B. Tokar, "Agriculture and Food in Crisis: An Overview," in *Agriculture and Food in Crisis: Conflict, Resistance, and Renewal*, ed. F. Magdoff and B. Tokar (New York: Monthly Review Press, 2010), pp. 10-17; D. Ehrenfeld, "Agriculture in Transition," in *Beginning Again: People and Nature in the New Millennium* (New York: Oxford University Press, 1993/1995), 164-74.

[3] B. Halweil, "Grain Harvests Flat," in *Vital Signs 2006-2007: The Trends That Are Shaping Our Future* (New York: Norton, 2006), 22-24.

[4] M. A. Altieri, *Genetic Engineering in Agriculture: The Myths, Environmental Risks, and Alternatives*, 2nd ed. (Oakland, CA: Food First Books, 2004); D. Ehrenfeld, *Becoming Good Ancestors: How We Balance Nature, Community, and Technology* (New York: Oxford University Press, 2009), 4-13; C. M. Benbrook, "Who Controls and Who Will Benefit from Plant Genomics?" Presented at the 2000 Genomic Seminar *Genomic Revolution in the Fields: Facing the Needs of the New Millennium* (Washington, D.C.: American Association for the Advancement of Science Annual Meetings, 19 Feb. 2000). http://www.biotech-info.net/AAASgn.html.

make and run the machinery that is needed on the monoculture farms; and to package and transport the crop surpluses to distant markets. By the 1970s well into the 1990s, cheap energy was starting to become a thing of the past.

The monoculture fields that were so much a part of the green revolution were also causing serious problems. The heavy equipment used on the fields was compacting and breaking down the soils, increasing erosion, and decreasing soil fertility. The chemicals used to combat the pests, weeds, and diseases that are a hallmark of monoculture were affecting the integrity of ecosystems as well as the health of humans and other species. Irrigation required large amounts of energy, and it was drawing down scarce groundwater reserves. And the shift from many small farms to a smaller number of large ones, combined with the displacement of farmworkers by machine labor, caused a mass migration of people from rural areas to cities all over the world, from Sao Paolo to Manila, creating huge urban slums.

Genetic engineering has had less time than the Green Revolution to reveal its problems, but so far they seem just as numerous and intractable. Some are specific to this technology; others are shared with the Green Revolution.

One problem specific to genetic engineering is that its exaggerated claims are based on a genetic fallacy. It is common knowledge that most genes have more than one function, often many more, and that expression of these functions can be influenced by the changing environment of the cell, of the entire organism, and of the external world. But the hype surrounding genetic engineering is grounded in the false belief that one gene does one thing—even when the gene is moved from one species to another—and that its expression remains constant over time. Sometimes this is true; frequently it is not. The public sees only the illusion of one gene, one function; the high failure rate of genetic engineering is proof that this hype cannot be trusted. For example, in March of 2012, Reuters reported that a group of plant scientists were warning that Monsanto's GM corn, which had been engineered to resist corn rootworm, was "losing its effectiveness," potentially leading to "significant production losses."

Similarly, in November of 2011, the U.S. Department of Agriculture, in an extensive study of Monsanto's "drought-tolerant" corn (MON87460), concluded that "equally drought resistant varieties produced through conventional breeding techniques are readily available."[5]

Contrary to the claims of agribusiness, genetically engineered crops have caused an increase in the use of pesticides. This is hardly surprising, because the companies that develop and sell the genetically engineered seeds are the same companies that produce the agricultural chemicals. For example, seeds genetically engineered to contain a bacterial pesticide, *Bt* (*Bacillus thuringiensis*) toxin, a naturally occurring bacterial toxin, kill some pests, but its use results in enabling other pests, previously viewed as minor disturbances, to rush in and fill the ecological void, with unexpected consequences. In a May 2010 *Nature* article, Jane Qiu gives an example:

> *More than 4 million hectares of Bt [GM] cotton are now grown in China. Since the crop was approved, a team led by Kongming Wu, an entomologist at the Chinese Academy of Agricultural Sciences in Beijing, has monitored pest populations at 38 locations in northern China, covering 3 million hectares of cotton.... Numbers of mirid bugs,...previously only minor pests in northern China, have increased 12-fold since 1997, they found.... [and according to Kongming Wu] 'Mirids are not susceptible to the Bt toxin, so they started to thrive when the farmers used less pesticide [for the bollworms].' [The mirids also eat] green beans, cereals, vegetables and various fruits.... The rise of mirids has driven Chinese farmers back to pesticides.*[6]

[5] APHIS (Animal and Plant Health Inspection Services), U.S. Department of Agriculture, "Monsanto Company Petition (07-CR-191U) for Determination of Non-regulated Status of Event MON 87460, OECD Unique Identifier: MON 87460-4, Final Environmental Assessment" (Washington, D.C.: U.S.D.A/APHIS, Nov. 2011).

[6] J. Qiu, "GM Crop Use Makes Minor Pests Major Problems," *Nature* (13 May 2010). doi:10.1038/news.2010.242.

A perhaps more serious problem caused by agricultural technology—both Green Revolution and genetic engineering—is the erosion of the genetic base upon which all of agriculture depends. For more than ten thousand years, farmers have been cultivating and saving the seeds of the plants they have found most productive; most resistant to pests, diseases, droughts, and floods; and most delicious. Tens of thousands of local varieties of hardy crop plants that yield high-quality food even under adverse conditions are the heritage of these millennia of farming. The best seeds have always been saved and passed on to the next generation by the farmers who grew them, and, since the nineteenth century, they have also been produced and sold by many seed companies. However, starting with the Green Revolution, and accelerating with the rise of genetic engineering, restrictive patent laws and the growing power of the agricultural chemical companies (which now own the major seed companies) have caused the loss of thousands of preexisting crop varieties. Many corporate owners of these varieties have deliberately discontinued them in order to make way for their own, patented seeds. Restrictive laws in some countries now punish farmers who save their seeds. Loss of agricultural varieties is a worldwide phenomenon. For example, according to Dr. H. Sudarshan, in India, where in the first half of the twentieth century there were an estimated 30,000 indigenous varieties of rice, it is now predicted that soon just 50 varieties will remain, with the top ten accounting for more than threefourths of the subcontinent's rice acreage.[7]

The spread of genetically engineered crops is causing a threat to traditional varieties and wild relatives of our crops. Corporate claims to the contrary, genetically engineered genes are escaping from the planted fields and contaminating the gene pools of traditional crops and their wild relatives. It is a paradox that the success of the Green Revolution, GM crops, and conventional agriculture largely depends on the preservation of the gene pools that are now being deliberately discarded by industrial agriculture, wiped out by herbicides, or accidentally contaminated with engineered genes. The genetic engineers are sawing off the very branch on which they sit.

Another effect of the genetic contamination is the transfer of the genes conferring the genetically engineered traits from the crops to the weeds. In another, more recent *Nature* news article, in August 2013, Jane Qiu reports that transgenes from rice crops genetically engineered to resist the herbicide glyphosate have crossed over into weedy relatives of the rice. Not only have the weeds become resistant to the weed killer, but they now have higher rates of photosynthesis, grow more shoots and flowers, and produce 48–125 percent more seeds per plant than their non-transgenic relatives. An ecologist at Shanghai's Fudan University stated that "making weedy rice more competitive could exacerbate the problems it causes for farmers around the world."[8]

Monocultures have been praised for their high yields, but even these appear to be an illusion. The physicist and agricultural scientist Vandana Shiva has exposed what she calls "the myth of productivity."[9] Traditional polyculture systems, where many different crops are grown close together on the same farms, actually produce more food per acre than do modern monocultures. A mixture of corn, cassava, and peanuts yields less corn per acre than a GM corn monoculture, but it produces two and a half times as much total *food* per acre. As Shiva points out, "The Mayan peasants in the Mexican state of Chiapas are characterized as unproductive because they produce only two tonnes of corn per acre. However, the overall food output is twenty tonnes." Shiva concludes that "industrial breeding has actually reduced food security by destroying small farms and the small farmers' capacity to produce diverse outputs of nutritious crops."

[7] H. Sudarshan, "Forward" in V. Ramprasad, *Hidden Harvests: Community Based Biodiversity Conservation* (Bangalore, India: Green Foundation, 2002), 4-6.

[8] J. Qiu, "Genetically Modified Crops Pass Benefits to Weeds," *Nature* (16 Aug. 2013). doi:10.1038/nature.2013.13517; H. Thompson, "War on Weeds Loses Ground: The Rise of Herbicide-resistant Varieties Drives a Search for Fresh Methods of Control," *Nature* 485 (24 May 2012): 430.

[9] V. Shiva, "Globalization and the War Against Farmers and the Land," in *The Essential Agrarian Reader*, ed. N. Wirzba (Lexington, KY: University Press of Kentucky, 2003), 121-39.

II. SUSTAINABLE ENERGY PRODUCTION

It was cheap energy that powered the Green Revolution and the entire industrial revolution of the twentieth century. Chief among the sources of energy was oil, a concentrated energy source that was easy to extract from the ground. Coal and natural gas completed the trio of "fossil fuels," carbon-rich substances that were the end result of millions of years of decay of plants buried deep underground. Although vast, the underground reserves of fossil fuels are finite, and the easily extracted parts of these reserves have been largely depleted.

As the physicist Albert Bartlett pointed out,[10] with an increase in fuel consumption of 7 percent per year, a typical twentieth-century growth rate, the amount of a fuel consumed in ten years is equal to the grand total of oil consumed in the recorded history prior to that decade. In other words, simple arithmetic shows that if oil consumption grows at a rate of 7 percent per year between 2010 and 2020, we will have used during that same decade an amount of oil equal to all the oil consumed in all the years before 2010. Clearly, these extraction rates cannot continue, and they haven't. The economist Herbert Stein put it succinctly in what has become known as Stein's Law: "If something cannot go on forever, it will stop."

The cheap energy that helped produce industrial civilization is nearly gone, as anyone who buys gasoline knows. This author remembers once, in the midst of a "gas war" during the 1950s, buying gas at 11 cents a gallon to fill the tank of his gas guzzler; now gasoline is more than thirty times as expensive. Some of the difference is due to a drop in the value of the dollar; most is because of dwindling supplies of cheap oil. Modern technologies of prospecting for new oil reserves are very sophisticated, yet new oil discoveries peaked in the 1960s. And oil consumption continues to grow, propelled by consumer demand and industrial expansion in China and India. However, according to World Energy Outlook 2010, global oil production peaked in 2006, and it is expected to decline from 70 million barrels per day in 2006 to less than 16 million in 2035. The International Energy Agency, the U.S. Joint Forces Command, and the oil companies themselves all know that cheap oil is a thing of the past.

The loss of cheap oil (and cheap oil = cheap energy) is an incontrovertible fact, so the technophiles have turned to the idea that technology will invent oil substitutes to power our technological civilization, and they keep alive their hopes that cheap energy will continue to be available to run a managed planet. Coal-to-liquid conversion; nuclear fission or fusion; hydrogen; tar sands and oil shale; fracking for natural gas; offshore and deep-sea oil and gas drilling; and the "renewables," including solar power, wind power, and biofuels, are expected to rescue us.

But the cold facts tear this dream to pieces. True, nearly all of the celebrated energy substitutes are technically feasible and have been shown to work, but all suffer from one or more major problems. They require largescale investment and have long lead-in periods. They frequently need expensive government subsidies. Some routinely cause serious environmental damage and have high greenhouse gas emissions. Some are subject to major accidents. Their processing may place great demands on scarce freshwater supplies and can require high energy inputs for production. They may not be capable of producing enough energy to replace what we now use. And all the new energy substitutes are guaranteed of being more expensive, often much more expensive, than conventional oil.

The University of Manitoba's Vaclav Smil, one of the world's leading energy experts, writing in the May–June 2011 issue of *American Scientist*, looked at the substitutes for conventional oil and dubbed them "the latest infatuations."[11] They reminded him of the scientist at the grand academy of Lagado, in *Gulliver's Travels*, who had spent eight years on a project for extracting sunbeams out of cucumbers. (Actually, as mentioned below, cucumbers probably could be used for biofuel, but nobody in their right mind would think that the world's energy needs could be met by cucumbers.)

Enthusiasm for the new energy sources waxes and wanes, as it does for any new fad. A few years ago the

[10] A. A. Bartlett, "Forgotten Fundamentals of the Energy Crisis," *Am J. of Physics* 46 (1978): 876-88.

[11] V. Smil, "Global Energy: The Latest Infatuations," *American Scientist* 99, no. 3 (2011): 212-19.

fad was hydrogen: Hydrogen-powered cars and distributed energy systems were the rage. But when people stopped to think, they realized that hydrogen is not a primary energy source (there are no hydrogen wells)—it takes money and energy to extract it from natural gas or water. Also, hydrogen is highly explosive (remember the Hindenburg disaster); is corrosive; and, in liquid form, even contains much less energy per gallon than does oil. Not surprisingly, we hear less about hydrogen cars now than we did in 2000.

Before hydrogen, nuclear fusion was going to save us. It was thought that ordinary seawater, believed to be in endless supply, could have acted as the fuel for a fusion reactor. The first patents for fusion reactors were registered in 1946. In 2012, sixty-six years and millions of research and development dollars later, I heard a lecture from a prominent fusion scientist who was equally enthusiastic about the limitless potential of fusion. When asked how long it would take to get a working reactor, she replied about thirty to forty more years.

Nuclear fission power plants have existed for decades in many countries. The oldest operating commercial nuclear power plant in the United States, New Jersey's Oyster Creek plant, has been producing power since 1969, and it is not scheduled to shut down until 2019. Until the Fukushima Daiichi disaster caused by the Tohoku earthquake and tsunami in March of 2011, many assumed (despite the earlier accidents at the Three Mile Island and Chernobyl plants) that nuclear power would ease the transition to a new, renewable energy world. Since Fukushima, fission has become an increasing cause for concern: Few new reactors are being built; Germany has announced that it will abandon nuclear power completely by 2022; and, after Fukushima, Japan closed or suspended its 50 nuclear reactors.

Moreover, as noted by Mark Bittman in *The New York Times*, on August 24, 2013:

> *The dangers of uranium mining, which uses vast amounts of water...[are] barely regulated or even studied. Thousands of uranium mines have been abandoned, and no one seems to know how many remain to be cleaned up. The cost of that cleanup...will be borne by taxpayers.... Then there's disposal of spent fuel.... Decades into the nuclear age there remains, incredibly, no real plan for this.... The economic viability of nuclear power is no more encouraging. Plants continue to close and generation rates continue to drop.... Subsidies for nuclear power have been more than double the expense of power generation itself.*[12]

U.S. oil shales and the Canadian tar sands contain large reserves, but the environmental damage associated with the extraction of the oil is enormous; a great deal of freshwater is used in the process; the energy ratio, Energy Returned Over Energy Invested (EROEI), is terrible—only about three barrels of oil out for every two barrels put in; and the need to construct new pipelines to transport the heavy, toxic crude oil from remote production sites many miles to distant refineries generates grave political and environmental problems. Offshore oil, another heralded energy source, is extremely expensive, and it was dealt a serious blow by the *Deepwater Horizon* explosion. The *Deepwater Horizon* drilling rig cost a billion dollars to build and a half-million dollars a day to operate—while it lasted.[13]

Improvements in the efficiency of energy generation and use can save us a great deal of energy. These improvements are both desirable and possible. Again, however, they are unlikely to meet the energy needs of a highly managed planet. Modern agriculture has a much lower energy efficiency than that of traditional farming systems, which take advantage of the free energy subsidies offered by nature. And even when efficiencies materialize, there is the Jevons Paradox, first described by the English economist W. Stanley Jevons in 1866: Increased efficiency of energy production leads to increased consumption. Using the coal industry as his model, Jevons showed that improvements in efficiency led to lower cost of the product, which in turn caused a rebound increase in consumption of the

[12] M. Bittman, "The New Nuclear Craze," *The New York Times*, 24 Aug. 2013, p. A21.

[13] For the cost of the *Deepwater Horizon* drilling platform, see J. Tainter and T. Patzek, *Drilling Down: The Gulf Oil Debacle and Our Energy Dilemma* (New York: Springer, 2012), 5.

coal. This paradox applies to other sources of energy besides coal.

Renewable energy. Let us take a closer look at renewable energy—solar, wind, and biofuels, the great hope of the neo-greens. According to Smil, the renaissance of renewable energy "has led to exaggerated expectations rather than to realistic appraisals." In 2011, he wrote:

> *Promoters of new renewable energy conversions that now appear to have the best prospects to make significant near-term contributions—modern biofuels (ethanol and biodiesel) and wind and solar electricity generation—do not give sufficient weight to important physical realities concerning the global shift away from fossil fuels: to the scale of the required transformation, to its likely duration, to the unit capacities of new converters, and to enormous infrastructural requirements resulting from the inherently low power densities with which we can harvest renewal energy flows and to their [irregularity].*[14]

Solar power. In his well-researched book *Green Illusions*, environmentalist Ozzie Zehner states:

> *If actual installed costs for solar projects in California are any guide, a global solar program [to replace fossil fuels in powering the planet] would cost roughly $1.4 quadrillion, about one hundred times the United States GDP. Mining, smelting, processing, shipping, and fabricating the [solar] panels and their associated hardware would yield about 149,000 megatons of CO_2. And everyone would have to move to the desert, otherwise transmission losses would make the plan unworkable.*[15]

Future costs of solar panels may come down with technological innovations (costs may already have started to plateau), but as Zehner notes:

> *Cheaper photovoltaics won't offset escalating expenditures for insurance, warranty expenses, materials, transportation, labor, and other requirements. Lowtech costs are claiming a larger share of the high-tech solar system price tag.*[16]

Passive solar power, which involves energy savings in heating and cooling achieved by sophisticated architectural design and construction, has been proving its worth for millennia, as the natives of New Mexico demonstrated in the tenth century with their incredibly energy efficient housing complex, which we call Pueblo Bonito. These energy efficiencies were built into Pueblo Bonito from the start of construction. Modern passive solar houses constructed today can be equally energy efficient and are a joy to live in. But many, perhaps most, existing homes have a limited potential for passive solar improvement.

Solar power has an important role to play among the energy sources of the future, but it does not seem to be about to replace cheap oil in maintaining our present industrial civilization.

Wind power. Wind power, like solar, is receiving a great deal of enthusiastic praise, some of it justified. I am among those who find the sight of a row of giant, stately wind turbines with their slowly moving blades thrilling and beautiful, but, admittedly, I don't live near them. Denmark is the pioneer in wind energy: In 2012, Denmark got 25–30 percent of its power from the wind, and now the country hopes to raise this figure to 50 percent or more. Denmark also produces half of the world's wind turbines. Like solar power, wind has a great deal to offer an energy-challenged future. Wind power is not, however, all smooth sailing.

In *The New York Times* on August 15, 2013, Diane Cardwell chronicled the problems experienced by Green Mountain Power, whose wind turbines line the ridge of Lowell Mountain in Vermont.[17] These problems are typical of those experienced by the wind power industry. Some of the difficulties include "curtailments," mandated cutbacks in energy production

[14] Smil, "Global Energy: The Latest Infatuations," *American Scientist* 99, no. 3 (2011): 212-19.

[15] O. Zehner, "Solar Cells and Other Fairy Tales" in *Green Illusions: The Dirty Secrets of Clean Energy and the Future of Environmentalism* (Lincoln, NE: University of Nebraska Press, 2012), 3-30.

[16] Ibid.

[17] D. Cardwell, "Grappling with the Grid: Intermittent Nature of Green Power is Challenge for Utilities," *The New York Times*, 15 Aug. 2013, pp. B1, B6; see also O. Zehner, "Wind Power's Flurry of Limitations," in *Green Illusions*, 31-60.

when the grid will not accept the wind power energy, either because the electric company can get energy cheaper elsewhere or for technical reasons involving the interface between fossil fuel generated electricity and wind power. Other difficulties involve the size of the lines carrying the power. When curtailments occur, the wind turbines must operate at a fraction of their potential output. In her article entitled "Intermittent Nature of Green Power Is Challenge for Utilities," Cardwell writes:

> *Because energy produced by wind...is intermittent, its generating capacity is harder to predict than conventional power's. And a lack of widely available, cost-effective ways to store electricity generated by wind only compounds the complex current marketplace.... [One wind power CEO noted that] at full operating capacity he can lose $1,000 an hour if the electricity is not sold. "We have a grid system that's not smart...it's a 100-year-old system—and they run it like fossils and nukes are the only things that matter and the rest of us, they can fiddle with," he said.*[18]

Integrating wind power into an electrical system that receives inputs from fossil fuel and nuclear plants plus, increasingly, solar installations involves daunting economic and technical challenges. Some of these will be fairly straightforward to resolve over time; others, like the difficulty or impossibility of storing excess wind power when the grid cannot accept it, are much harder to fix.

Among the other problems that are an inseparable part of wind power are the fact that wind turbines kill bats and migrating birds, that wind power installations on the roofs of city buildings are noisy and hard to maintain, that turbine installations on ridgetops damage and fragment some of the last undisturbed wildlife habitats, and that many people complain that the huge turbines spoil their view of the countryside or of their neighboring coastal waters.

Bat and bird kills by turbines are easy to document. Numerous counts have been published of dead bats and birds collected under turbines; but there is as yet no evidence that any populations are threatened by wind power, and some radar studies have shown birds flying well above the turbines during migration. Urban wind power production on the tops of tall buildings has been promoted by neo-greens as a renewable source of energy in cities, but noise and maintenance issues are likely to limit the potential of urban wind energy for the foreseeable future. Even outside of cities, some people living in rural areas near wind turbines complain of health problems such as insomnia, anxiety, palpitations, and nausea, allegedly related to the low frequency noise. The existence of this "Wind Turbine Syndrome" is still debated.[19] As for the question of unsightliness of the windmills, there is no right answer; some love them, some don't.

Biofuels. Biofuels are another mixed blessing as a replacement for vanishing cheap fossil fuel energy. The idea of biofuels is straightforward: Use plants to capture the energy of sunlight (like the Lagado cucumbers), and get some of that energy back by extracting energy-rich substances from the plants (sugars and other hydrocarbons) that can be either turned into fuel, such as ethanol, by chemical processing or used directly as a diesel fuel substitute. Corn, sugarcane, soy, rapeseed, palm and other tree oils, grasses, algae, and the desert plant called *Jatropha* are some of the plants used for biofuel.

Like solar and wind power, biofuels have a dark side. Some of the plants grown for biofuel, especially the grasses, can escape from cultivation and become invasive species, particularly harmful in agricultural fields. The EROEI of biofuels is troubling. Corn ethanol from the American Midwest has an EROEI ratio of about 1.0 or even lower, meaning that if we total the energy costs of growing the corn, harvesting it, and then processing it, we find that the amount of energy we get back is only equal to or less than the energy we put in, clearly a losing proposition. Meanwhile, we

[18] Cardwell, "Grappling with the Grid: Intermittent Nature of Green Power is Challenge for Utilities," *The New York Times*, 15 Aug. 2013, pp. B1, B6.

[19] K. French, "'Never Stops, Never Stops. Headache. Help.': Some People Living in the Shadows of Wind Turbines Say They're Making Them Sick. Almost As Upsetting: Their Neighbors Don't Feel a Thing," *New York Magazine*, 23 Sept. 2013, p. 28.

have wasted land that could have been used for growing food and have also driven up the price of corn. The EROEI of other biofuels can be better than that of corn ethanol, but not always enough to offset the other difficulties of the technology.

If the results for corn ethanol are so poor, why does the Midwest in the United States continue to produce so much of it? The answer is political: Midwestern states receive huge federal subsidies for growing corn and producing ethanol, and few politicians are willing to tell the truth about corn ethanol and risk the wrath of midwestern voters.

The land used to grow biofuel plants is unavailable for growing food in a hungry world. True, plants like *Jatropha* grow well in dry, nutrient-depleted soils that are not suited for crops. But the conceivable supply of *Jatropha*-derived biofuel could run only a tiny fraction of the world's vehicles.

Timothy Beardsley summed up the problems with biofuels in an editorial titled "Biofuels Reassessed," in the October 2012 issue of *BioScience*:

> *It takes a lot of land, a lot of water, and a lot of energy to produce biofuel crops and convert them into usable fuels. The displacement of food crops by biofuels has already increased food prices, and many have argued that such effects will put limits on the biofuel enterprise.... The enthusiasts are right that improvements [in biofuel technology] are possible...and the seriousness of the looming energy crisis—only partly ameliorated, at substantial environmental cost, by fracking—argues for the continuation of such efforts. Still...it is important to understand biofuel's limitations.*[20]

Beardsley cites scientific studies showing that the amount of biofuel that globally could be produced is four times lower than previously published estimates:

> *All these numbers exclude losses due to manufacturing the fuel.... Actual current global primary productivity suggests strongly that biofuels have less promise than many had thought.... Some new biofuels may yet alleviate the human predicament, but nobody should be under any illusions about the constraints that nature—ultimately through the laws of thermodynamics—has put in the way.*[21]

In concluding this section on renewable energy, we should heed the words of Vaclav Smil: "None of us can foresee the eventual contours of new energy arrangements—but could the world's richest countries go wrong by striving for moderation of their energy use?"[22] In other words, the best thing we can do to sustainably run the Earth and our own civilization is to depend less on technologies of control and more on regulation of our own self-destructive consumption.

III. GEOENGINEERING TO CONTROL CLIMATE CHANGE

To begin, climate change is a reality. In 1981, NASA physicist James Hansen calculated the extent of global warming he expected in the near future, based on man-made CO_2 emissions. Three decades later, these calculations have proven exceptionally accurate.[23] Temperatures have risen to meet or exceed Hansen's predicted levels; polar ice is melting; and drought-prone areas are receiving less rainfall. In recent years, other consequences of climate change—more frequent and more violent storms, and rising sea levels—have forced themselves on our attention. In a May 9, 2012, article in *The New York Times*, Hansen writes that if we were to continue to burn conventional fossil fuels and to exploit Canada's tar sands:

> *Concentrations of carbon dioxide in the atmosphere eventually would reach levels higher than in the Pliocene era, more than 2.5 million years ago, when sea level was at least 50 feet higher than it is now.... Disintegration of ice sheets would accelerate out of control. Sea levels*

[20] T. Beardsley, "Biofuels Reassessed," *BioScience* 62(2012): 855; see also S. Raghu et al., "Adding Biofuels to the Invasive Species Fire," *Science* 313(2006):293.
[21] Beardsley, "Biofuels Reassessed," *BioScience* 62(2012).
[22] Smil, "Global Energy: The Latest Infatuations," *American Scientist* 99, no. 3 (2011): 212-19.
[23] J. Major, "1981 Climate Change Predictions Were Eerily Accurate," io9 (16 Aug. 2012). http://io9.com/5899907/1981-climate-change-predictions-were-eerily-accurate.

would rise and destroy coastal cities. Global temperatures would become intolerable. Twenty to 50 percent of the planet's species would be driven to extinction. Civilization would be at risk. That is the long-term outlook. But near-term, things will be bad enough. Over the next several decades, the Western United States and the semi-arid region from North Dakota to Texas will develop semi-permanent drought, with rain, when it does come, occurring in extreme events with heavy flooding. Economic losses would be incalculable. More and more of the Midwest would be a dust bowl. California's Central Valley could no longer be irrigated. Food prices would rise to unprecedented levels.[24]

Other parts of the world, including its most populous nations, China and India, are already experiencing the effects of climate change. In China, the Gobi Desert is expanding, moving toward the Yellow River, and is within 100 miles of Beijing. Growth of the Gobi is the result of not only climate change but also careless use of groundwater and indiscriminate logging in the past. Groundwater use and logging can be and are being controlled to some extent by the government, and millions of trees are being planted at the edge of the desert to halt its advance, but global warming is a continuing presence. In India, now the world's sixth-largest emitter of greenhouse gases (carbon dioxide, methane, and nitrous oxide), disastrous floods have been attributed to climate change; melting of the Hindu Kush ice mass is accelerating; and sea-level rise is forcing saltwater into coastal aquifers, contaminating drinking water.

The solution to the problem of climate change is obvious: We must immediately halt the expansion of greenhouse-gas release and quickly start to reduce it below present levels. A number of well-publicized, highlevel meetings of governments have confronted this issue, with some positive results. But international environmental agreements are subject to compromise and delay; meanwhile, greenhouse gas levels continue to rise. Impatient with the political process, some scientists have decided that geoengineering offers the best hope of managing our planet. Geoengineering solutions fall into three categories: dimming the sunlight reaching Earth; using plant photosynthesis to take up and reduce the carbon dioxide already in the atmosphere; and capturing carbon dioxide, turning it into charcoal, and burying it in the Earth.

There are various proposed ways to reduce the sunlight reaching the Earth. One solution, inspired by the observed effects of volcanic eruptions, would be to spray solar-reflective sulfates into the stratosphere, perhaps from a giant balloon. Other schemes include using rockets to send tiny reflectors into space, growing lighter-colored crops genetically engineered to reflect sunlight, painting all roofs white, and covering the Earth's deserts with reflective Mylar.

Some of these ideas, like desert Mylar and lighter-colored crops, are too preposterous to deserve comment. After careful evaluation, most of the schemes, like painting roofs white, would not have enough effect to make a significant difference in global warming. Injecting 5 million tons of sulfates per year into the stratosphere (like other sunshade schemes) could make a difference, especially in the tropics, but could also disrupt monsoons, bringing famine to millions, and, according to Oxford's Tim Palmer,[25] "You might turn the Amazon to desert." Sending enough tiny reflectors into space could require an estimated 20 million rocket launches. And if there were bad side effects, how would we get our little reflectors back? Using plants to pull carbon dioxide out of the atmosphere through photosynthesis has no obvious adverse side effects, and it does have the added benefit of putting oxygen back in place of the carbon dioxide removed. Planting forests of relatively fast-growing trees can tie up a good deal of carbon dioxide. Reforestation is gen-

[24] J. Hansen, "Game Over for the Climate," *The New York Times*, 9 May 2012.

[25] See S. Battersby, "Cool It: From Sunshades to Making the Seas Bloom, There Are Plenty of Ideas About How to Stop the Planet Warming. But Will Any of Them Work?" *New Scientist* 215, no. 2883 (22 Sept. 2012): 31-55; J. Winston, "Geoengineering Could Backfire, Make Climate Change Worse," *Wired UK*, 16 July 2012, http://www.wired.com/wiredscience/2012/07/geoengineering-climate-change/; C. Hamilton, "Geoengineering: Our Last Hope, Or a False Promise?" *The New York Times*, 27 May 2013.

erally a good idea, not just because of carbon sequestration but because of beneficial effects on local climate, water storage, and stream flow.

Reforestation, however, is slow, varies greatly from country to country, and can present ecological and social challenges. Reforestation can be a win-win procedure to slow climate change. But planet managers are an impatient lot—reforestation is too slow for many of them.

Algae in the world's oceans remove a great deal of carbon dioxide by photosynthesis, and some climate engineers might ask, Why not fertilize the oceans, increase the algal numbers, and pull out more carbon dioxide? This would slow climate change, benefit marine food webs that are based on algae, and even, in closed systems, provide algal biomass to be used as animal food or for biofuels. That's the theory, and it works to some extent. Dumping iron fertilizer in the ocean does stimulate algal growth; the algae do remove carbon dioxide; and, when they die, some of them take the carbon out of harm's way by sinking to the bottom of the ocean.

Unfortunately, ocean fertilization with iron can also stimulate toxic algal blooms and cause production of the greenhouse gas nitrous oxide. And when the algae die, as they do in vast numbers during blooms, the decomposition of algal bodies that stay at the surface pulls oxygen from the water while putting carbon dioxide back in the atmosphere. In closed, artificial systems, unlike ocean fertilization, the main difficulties are the costs of building, maintaining, and aerating the containers for the algae and the problem of scale—these systems will have limited impact on global climate change and biofuel energy production.

Carbon capture and storage is a geoengineering method that can reduce climate-changing carbon dioxide. The carbon dioxide is captured and removed at point sources, usually the smokestacks of large fossil fuel power plants, and then moved to sites where it can be deposited underground. This is a good idea, but one whose impact is limited because there are so many nonpoint sources of greenhouse gases. The principal risk of carbon capture and storage is leakage of the gas back into the atmosphere from its underground burial sites (declining oil fields, saline aquifers, un-mineable coal seams, and other suitable geological formations). Deep-well injection of unwanted substances has caused earthquakes. Needless to say, carbon capture and storage is a great deal more expensive than simply letting the gas escape into the atmosphere, and it may require government-sponsored incentives and subsidies.

Geoengineering has a great appeal to those looking for quick and simple solutions to overwhelming, complex problems. Such searches tend to promote tunnel vision, in which the gaze is always on simple models and their associated technical solutions, not on the many, sometimes serious, unpredictable, and unmanageable side effects produced by geoengineering technologies. Vaclav Havel, author and first president of the Czech Republic, wrote in *The New York Times* on September 27, 2007:

> *I'm skeptical that a problem as complex as climate change can be solved by any single branch of science. Technological measures and regulations are important, but equally important is support for education, ecological training and ethics— a consciousness of the commonality of all living beings and an emphasis on shared responsibility.*[26]

IV. ACCIDENT PREDICTION, CONTROL, AND REPAIR

Our global management systems rest on a precarious edifice of predictions. These include predictions about the sustainability of industrial agriculture; the safety of nuclear power plants; the stability of the global political structure; the efficacy of our ecological restorations; the future of globalization—especially global trade; the continuation of economic growth; and, above all, the ability of our technology to solve any problems we face, now or in years to come.

These predictions are often unwarranted and very dangerous. One would think that the first priority of the planet managers would be to look at their past predictions and assumptions and see how well they have worked out. But this might involve admitting failure and, more important, shutting off sources of revenue

[26] V. Havel, "Our Moral Footprint: The Earth Will Survive—But Will We?" *The New York Times*, 27 September 2007, p. A33.

for the failed projects. Consequently, risk assessments made at the start of projects are frequently "cooked," unwarranted justifications for enterprises scheduled to go ahead no matter what.

In their book *Useless Arithmetic: Why Environmental Scientists Can't Predict the Future*,[27] geologists Orrin Pilkey and Linda Pilkey-Jarvis show how a model of future beach erosion and coastal sand movements has been used to justify escape from reality and allow construction of questionable shoreline structures and buildings. The standard model used in beach engineering is the Bruun Rule, which describes how shorelines retreat in response to rising sea levels. This simple model to describe a complex process has some general validity, but, as the authors note:

> *The Bruun Rule resides in a world dominated by engineers rather than scientists. It is a world where it is not possible to admit defeat and walk away or to respond flexibly, one where an answer must be found...and where the answer, to be credible, is best found by the most sophisticated means possible.... Evidence continues to accumulate from all over the world that the basic assumptions behind the Bruun model are very wrong. Yet it continues to be widely applied by coastal scientists, who should know better, and blindly applied by social scientists, planners, and international agencies concerned with how future global trends will affect coastal cities.*[28]

When the Bruun Rule is used to predict the rate of erosion of a parTHE ticular shoreline, one has to know only the rate of sea-level rise and the slope of the shoreface on that particular beach. Two variables; it's easy. But as Pilkey and Pilkey-Jarvis show, there are at least 31 variables that matter, including beach subsurface geology, sand grain size, coastal sediment supply, beach nourishment projects, storm types and frequency, shoreline vegetation, upland bluffs and dunes, dam construction and removal in neighboring rivers, and history of dredging.

> *Even if you know how each of the factors works and interacts with other factors, including sea-level rise, in causing shorelines to retreat, you still can't predict the future because you don't know the order in which the factors will occur.... On different shorelines the various parameters will be of varying importance, over varying time frames. This is ordering complexity. This is why shoreline retreat related to sea-level rise cannot ever be accurately predicted.*[29]

Ordering complexity can make some management predictions absurd. Pilkey and Pilkey-Jarvis give, as the ultimate preposterous example, the Department of Energy's Total System Performance Assessment (TSPA) for the proposed nuclear waste repository at Yucca Mountain, Nevada. The assessment of the chances of radioactive leaks from the underground repository, based on hundreds of models, is that it will be safe for more than a hundred thousand years. Yet, as the authors show, there are at least 15 important factors that will affect the seriousness of future leaks. None of these factors were known when the TSPA was formulated, and many will never be known.

In 2009, the Environmental Protection Agency issued a rule requiring that the Department of Energy (DOE) strictly limit the amount of radiation from the facility to no more than 15 millirems per year for the first ten thousand years after the facility's closure, and requiring the DOE to show that the nuclear waste repository will resist earthquakes, volcanic activity, climate change, and container leakage for 1 million years. The risk assessment charade came largely to a halt when work on Yucca Mountain was ended by Congress in 2011, for political reasons. It remains to be seen whether it will be started again.

Ordering complexity is only one kind of complexity that makes the long-term predictions and assumptions used in planet management unreliable. The other is structural complexity. The pioneer in studying the hazards of structural complexity is Charles Perrow, Professor Emeritus of Sociology at Yale. Using the well-studied 1979 accident at the Three Mile Island

[27] O. H. Pilkey and L. Pilkey-Jarvis, *Useless Arithmetic: Why Environmental Scientists Can't Predict the Future* (New York: Columbia University Press, 2007).

[28] Pilkey and Pilkey-Jarvis, *Useless Arithmetic: Why Environmental Scientists Can't Predict the Future*, 101.

[29] Pilkey and Pilkey-Jarvis, *Useless Arithmetic: Why Environmental Scientists Can't Predict the Future*, 107.

nuclear plant as his model, Perrow showed how the sheer complexity of the nuclear plant made accidents inevitable and unpredictable—"normal."

The operating system of a nuclear power plant has a large number of separate subsystems, many of which interact in ways that cannot be directly observed, and in ways that might not be understood even if they were observed. Moreover, the operating systems interact with safety systems, which are themselves complex and often cannot be directly observed.

In his book *Normal Accidents: Living With High-Risk Technologies*, Perrow describes how the accident at Three Mile Island was caused by failure of a pressure-relief valve, which resulted in radioactive water boiling out and onto the floor of the reactor building.[30] This could have been determined only indirectly by the control room operators from a variety of gauge readings; while three audible alarms were sounding and simultaneously many of the 1600 lights on the control panels were flashing. Only 13 seconds elapsed between the time of the valve's failure and the time when the accident became irrevocable. The scene in the control room was chaos.

Several hours after the start of the accident, control room personnel and supervisors were still arguing about what was happening. The valve stayed open for two hours and twenty minutes until a new shift came on and somebody thought to check it. But the accident was just getting started. Two reactor coolant pumps did not work (possibly because of steam bubbles in the lines), and levels of coolant began to drop alarmingly, the most feared happening in a nuclear plant. The two dials indicating reactor pressure gave diametrically opposite readings.

Then, thirty-three hours into the accident, an ominous bang was heard in the control room. It was a hydrogen explosion inside the reactor building. No one had expected this. Frantic discussions occurred between the plant operators and the commissioners of the Nuclear Regulatory Commission. The emergency pumps, like all electric motors, can produce sparks; when hydrogen accumulates, a spark can cause an explosion that could destroy the reactor building. Should the pumps be turned off or kept running? Opinions varied. That an explosion did not happen was in good measure a matter of luck.

Because of the vast complexities of nuclear plants, paradoxically including their safety systems, the operators did not actually know what was happening while the accident was going on. But they had to do something. In this sort of situation, Perrow notes, you form a mental model of events. You imagine what is happening, based on the inadequate and partially erroneous information that you have. "You are actually creating a world that is congruent with your interpretations, even though it may be the wrong world. It may be too late before you find that out."[31]

In other words, the complex systems that we invent to manage and run our world cannot be made fail-safe. And if we add economic and ecological interactions, our constructed systems become still more complicated and accident-prone.

Here is an example: On April 20, 2010, the *Deepwater Horizon* oil drilling rig in the Gulf of Mexico suddenly exploded in flames. As chronicled by Joseph Tainter and Tadeusz Patzek, in their book *Drilling Down:*

> *The Gulf Oil Debacle and Our Energy Dilemma:*
>
> *Everything seemed to be under control, with the computers in charge and their sensors humming. The people assigned to watch these computers, and act on their advice, were content and getting ready to go to sleep.... Suddenly all hell broke loose, and it became clear that the people watching the computer screens did not understand what the computers were telling them. It took just a few seconds for their false sense of*

[30] C. Perrow, *Normal Accidents: Living With High-Risk Technologies* (Princeton, NJ: Princeton University Press, 1999); see also D. Ehrenfeld, "When Risk Assessment is Risky: Predicting the Effects of Technology" in *The Energy Reader: Overdevelopment and the Delusion of Endless Growth*, ed. T. Butler, D. Lerch, and G. Wuerthner (Sausalito, CA: Foundation for Deep Ecology in collaboration with Watershed Media and Post Carbon Institute, 2012), 77-83.

[31] C. Perrow, *Normal Accidents: Living With High-Risk Technologies* (Princeton, NJ: Princeton University Press, 1999), p. 28.

> *security to go up in the same flames that consumed the* Deepwater Horizon *in two days.*[32]

When the flames were extinguished, the accident was far from over. Several months later, the well was finally capped. By then, an estimated 210 million gallons of oil had leaked into the gulf. Various attempts were made to contain the oil or mitigate its effects. State of the art technologies were used. But several years later, we still do not know the long-term effects of this accident on the thousands of species living in the immensely complicated gulf ecosystem, or on the human communities of the adjacent land areas.

Tainter, a professor in the Department of Environment and Society at Utah State University, and Patzek, Chairman of the Department of Petroleum and Geosystems Engineering at the University of Texas, analyze in detail the causes of the accident. At the end of their book, they conclude:

> *The* Deepwater Horizon *was a normal accident, a system accident. Complex technologies have...ways of failing that humans cannot foresee. The probability of similar accidents may now be reduced, but it can be reduced to zero only when declining [energy returns] makes deep-sea production energetically unprofitable. It is fashionable to think that we will be able to produce renewable energies with gentler technologies, with simpler machines that produce less damage to the earth, the atmosphere, and people. We all hope so, but we must approach such technologies with a dose of realism and a long-term perspective.*[33]

Three Mile Island and *Deepwater Horizon* teach us a simple lesson: We cannot predict all the accidents that will occur in our managed world; and even if we could predict them, we could not prevent many of them from happening. Disasters in our complex systems are bound to take place, and the techno-utopians' models offer no credible ways of fixing them.

V. OTHER GLOBAL MANAGEMENT CONCERNS

Successful global management requires addressing issues of necessity besides the concerns listed above. To describe them briefly, they include:

Ecological restoration and preservation: In some cases, restoration of damaged ecosystems is possible if done with care and ecological knowledge; in others, it can be difficult or impossible. Restorations are often confounded by ignorance of the component species and complexity of the specific ecosystem; by prior species extinctions; by major soil or water changes; and by lack of sufficient funds to do the restoration properly or to monitor it after the restoration is complete.

Preservation can be as hard as restoration. Moving species endangered by climate change to more favorable climate zones ("assisted colonization"), and attempts to reintroduce recovering populations of endangered species to their original habitat are challenged by the limitations of our ecological knowledge. This is not a reason to abandon restoration and preservation efforts, but it should make us think twice before we boast about how green the coming garden planet will be.

Maintenance of adequate supplies of clean freshwater will be essential for sustainable global management; it is not happening now, and there are no affordable technologies on the horizon that will assure water for everyone, especially in the face of climate change. Already, international fights over water management complicate tense politics in the Middle East, South Asia, and parts of Africa. Water will undoubtedly be one of the greatest obstacles to a managed planet.

Growing populations require more space, more food, more water, more mineral resources, and more energy than stable ones; and they produce more waste. The Earth's population is growing: Estimates published by the United Nations (UN) in June of 2013 suggest an increase from today's 7.2 billion to 9.6 billion by 2050.[34] Population growth models are no more reliable than any long-term predictions involving thou-

[32] J. Tainter and T. Patzek, *Drilling Down: The Gulf Oil Debacle and Our Energy Dilemma* (New York: Springer, 2012), pp. 7-8.
[33] Tainter and Patzek, *Drilling Down: The Gulf Oil Debacle and Our Energy Dilemma*.
[34] C. Sullivan and ClimateWire, "Human Population Growth Creeps Back Up," *Scientific American* (June 14, 2013). http://www.scientificamerican.com/article.cfm?id=human-population-growth-creeps-back-up&print=true.

sands of variables (climate and sea level, disease, ethnic conflicts and warfare, economic changes, etc.), and this sort of unreliability will greatly increase the difficulty of managing a gardened Earth. A point to consider is that per capita consumption is increasing more than twice as fast as population in many places around the world.

A managed world assumes *good working coordination between nations*. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) shows that this is occasionally possible.[35] By 2013, 178 nations had ratified the convention, which protects—at least on paper— thousands of endangered animal and plant species from over-exploitation. With exceptions, this protection has been moderately successful. A great weakness of the treaty, however, is that reservations (exceptions) can be taken by member countries for specific species. Iceland, Japan, and Norway have taken reservations that allow them to hunt some baleen whale species, and Saudi Arabia has taken falcons as an exception. CITES is an encouraging model; nevertheless, the proliferation of regional military conflicts, terrorism, religious and ethnic strife, exhaustion of resources, and political instability do not bode well for cooperative management of the planet.

I have considered the various threats to the neogreen vision individually, but of course they interact, usually making the situation worse. For example, scarcity of cheap energy affects modern food production and water availability, while causing us to rely on increasingly dangerous energy technologies, which are prone to accidents that we are unable to predict. Similarly, climate change has a major impact on food, water, international relations, and energy use.

In conclusion, the paragraphs above give only an incomplete sampling of the reasons why many of the dreams of the planet-managing neogreens and ecological modernists are likely to turn into nightmares. In his chilling short story "The Machine Stops," written more than a century ago, E. M. Forster described the chaos and total collapse that descended on a managed world when the "Mending Apparatus," which had always repaired everything that was broken, itself began to fail: "Man, the flower of all flesh, the noblest of all creatures visible, man who had once made god in his image...was dying, strangled in the garments that he had woven."[36]

The dream-to-nightmare scenarios outlined here do not have to become reality. We *can* keep trying to make the world a better place, using any safe technology that is proven or seems promising. For instance, we already know that traditional polycultures can reliably produce far larger amounts of food than can industrial monocultures year after year, with less input of chemical fertilizers and pesticides. The field is wide open to apply careful, modern scientific research to improve this performance still further. And in the case of our energy deficit, reduction of consumption is safer, easier, faster, and more effective than deep-sea oil drilling or nuclear power.

Wendell Berry wrote in *The Unsettling of America* that "what has drawn the Modern World into being is a strange, almost occult yearning for the future. The modern mind longs for the future as the medieval mind longed for Heaven."[37] This yearning, embodied in the blind worship of technology, has led us astray—if we open our eyes and look at who and where we are, we have our best chance of finding out where to go next. I end with a quote from my book *The Arrogance of Humanism,* published in 1981, with words that I believe are as applicable now as the day they were written:

> *Not all problems have acceptable solutions.... There is...no need to feel defeated by the knowledge that there are limits to human power and control.... [We should start] with the honest admission of human fallibility and limitations, and from this realistic base [rise to the] challenge to construct a good life for oneself, one's family, and one's community.... We simply start with realism and then free the human spirit for*

[35] Convention on International Trade in Endangered Species of Wild Fauna and Flora, http://www.cities.org/eng/disc/what.php (accessed Sept. 12, 2013).

[36] E. M. Forster, "The Machine Stops" (1909) in *The Collected Tales of E. M. Forster* (New York: Modern Library, 1968), 144-97.

[37] W. Berry, *The Unsettling of America* (San Francisco: Sierra Club Books, 1977), 56.

high adventure, struggle, and an unknown fate.[38]

[38] D. Ehrenfeld, *The Arrogance of Humanism* (New York: Oxford University Press, 1981): 211, 228-29.

In Memory of Doug Tompkins

Paul Kingsnorth, *Dark Mountain*

Adapted with permission from an essay originally published on dark-mountain.net.

On December 8, 2015, the conservationist and philanthropist Doug Tompkins died at 72 years old in a canoeing accident in Patagonia, Chile, where he lived. I knew Doug a little, having spent some time with him and his wife Kris in Chile a few years back, and I was in communication with him for a long time after that. I admired him and his work hugely. I don't have many heroes, but Doug was one of them. I believe his loss is a tragedy, and not just for those close to him.

Between them, Doug and Kris Tompkins spent the last 25 years working on one of the most ambitious conservation and rewilding projects on Earth, creating protected national parks in vulnerable areas of Chile and Argentina to provide a vital refuge for endangered wildlife at a time when the human demands on the non-human world increase daily. Between them, they protected more land from "development" than any other private individuals in history—over 2 million acres in total, and there were plans for more.

This remarkable display of both philanthropy and ecological ambition was a long-term project not simply to preserve wild nature and give it some chance of recovery, but also to persuade others to contribute to an overarching plan to connect protected areas throughout the continent, and in so doing to provide a wild corridor through which non-human life could move and survive. There is nothing else quite like it anywhere on Earth, and Doug's widow, Kris, who was a partner in the work and who similarly dedicated her life to it, has made clear in the last few days that she will continue, and even accelerate, it.

For me, though, perhaps the most significant thing about Doug and his work was not the amount of money he'd made setting up the clothing companies Esprit and the North Face (which he later came to loathe as the epitome of the corporate culture destroying the planet) nor even the way he spent that money conserving and restoring so much wild land. What struck me most about Doug was the worldview which drove this work, which was rare, honest and uncompromising.

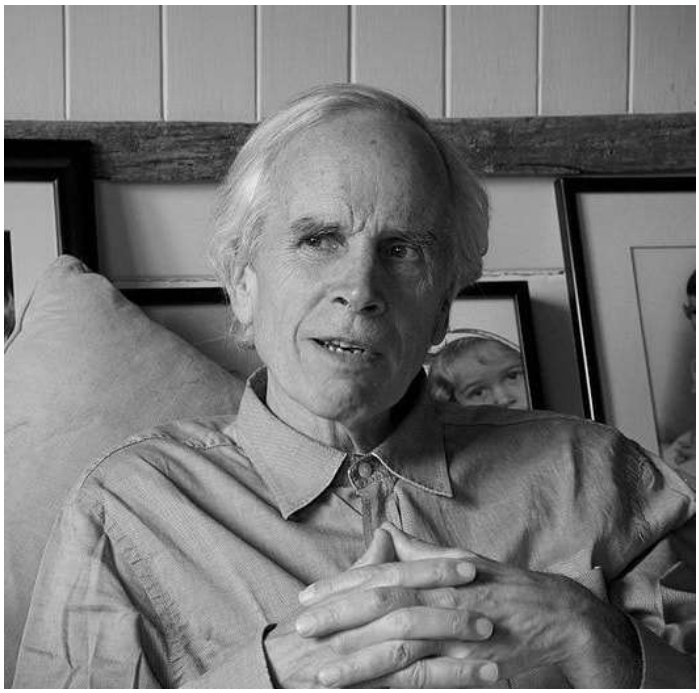

Figure 1. Doug Tomkins. Sam Beebe © CC BY-SA 2.0.

Doug saw the protection of non-human life, in the face of the human onslaught, as the crucial work of our time. He saw much of the green and conservation movements—rightly, in my view—as fatally compromised both by their need to remain broadly popular and by their increasing interest in human-centered social and political concerns. For the mainstream green movement today, human "social justice" often seems as important as protecting non-human nature from human rapacity, despite the fact that the two are often in conflict ("there's no social justice on a dead planet" was one of Doug's favorite aphorisms). The deep denial which runs through our civilization right now, across the political spectrum—a refusal to accept the reality and implications of everything from climate change to human population numbers to the impossibility of limitless growth—is to be found everywhere,

including in the green movement, and in most of our lives, most of the time.

Doug's worldview, in contrast, was so long-term as to be incomprehensible to many people. He was a deep time thinker, aiming to preserve wild places and species in order to get them through the bottleneck of the "great acceleration," as the human economy consumes all around it in a desperate struggle to keep growing. The work he did was not designed to pay out today, tomorrow or next year; it wasn't especially designed to pay out to humans at all. It was a grand project designed with just one aim: to save as much of the wild world as possible from destruction.

This kind of work will always be hard and unpopular, and perhaps only people as determined, bloody-minded and ultimately wealthy as Doug Tompkins can really do it. Doug knew that civilization and nature were on a collision course—indeed, were already colliding, and that the consequences for wild nature were terrible. He didn't finesse that truth, he simply spoke it, whether people liked hearing it or not—and most, including many mainstream conservationists and establishment greens, didn't like it at all. But he spoke it anyway. And then he did something about it.

For his pains, he was often described—when his opponents were feeling polite—as "radical" or "controversial," words that are regularly used about anybody foolhardy enough to undertake work that does not put the interests of "developed" human beings before anything else that lives. To me, what he was doing was neither of these things—it was just blindingly obvious, common sense, necessary work for the age of ecocide. The real controversy is that more people aren't doing it.

I like to compare our culture's treatment of Doug with its treatment of Steve Jobs, another wealthy US entrepreneur of the same generation. The two were friends, though friends with very different worldviews. Jobs, who spent his life creating a global web of oil-based digital technologies which encourage humans to divorce themselves from nature and disappear into virtual worlds, is lionized to such a degree that Hollywood will make a gushing biopic about him. Doug, who walked away from the same culture to dedicate himself to preserving huge swathes of the wild Earth, remained largely unknown until his death. Benedict Cumberbatch is unlikely to be portraying him on the big screen anytime soon, which is at least one crumb of comfort.

Being unknown, in any case, can be a blessing. In the end, the work, and the legacy, are what matters, and Doug's is huge. If humans make it through the bottleneck, and if other life forms do as well, and if future generations come to properly appreciate a worldview that does not see the world as a human plaything, it will be at least partly because of the work done by Doug and his companions. His loss today, though, is a hard blow, and I for one will miss him.

Briefly Noted

***Recognizing the Autonomy of Nature: Theory and Practice* by Thomas Heyd (ed.). Columbia University Press (2005), 232pp. $39. ISBN 9780231136068.** — reviewed by John Jacobi

This collection of essays investigates the ethical concept of "recognizing and respecting the autonomy of nature," and is an important read for any wildist. Some of the essays are interesting only because of how well they represent the usual voices in the debate, so are not strictly necessary to read. However, the essays by Eric Katz, Ned Hettinger, Bill Throop & Beth Vickers, and the introduction by Thomas Heyd are all well worth reading. Katz' addition was by far the most interesting, as he argued for the strict interpretation of "autonomy of nature" that is espoused by wildists.

***Keeping the Wild: Against the Domestication of Earth* by George Wuerthner, Eileen Crist, Tom Butler (eds.). Island Press (2014), 248pp. $24.95. ISBN 9781610915588.** — reviewed by John Jacobi

This collection is the response of the wilderness conservationists to the Anthropocene boosters like Peter Kareiva and Stewart Brand, who advocate turning the earth into a garden, or, in their words, embracing the fact that humans already are gardeners. It is a good book on many counts. The additions by David Ehrenfeld, Ned Hettinger, Dave Foreman, and Howie Wolke are the best, especially Ehrenfeld's, which eviscerates the notion that new technology can live up to the promises of the boosters. Still, the book suffers from some severe weaknesses, especially the motif of conservation being the next step on the ladder of social progress. This no doubt was a response to Kareiva's charge of misanthropy and call for humanitarianism at the expense of wilderness, but such a response is unprincipled. At some point the wilderness conservationists are going to have to admit that restoring wildness is at odds with humanitarianism, social progressivism, and left humanism. Finally, the book is fairly repetitive, so readers shouldn't feel guilty about skimming large portions of the less well-written essays.

***The Science of Morality* by Joseph L. Daleiden. Prometheus Books (1998), 460pp. $39.98. ISBN 1573922250.** — reviewed by John Jacobi

Most people are only familiar with Sam Harris' argument for a science of morality in *The Moral Landscape*. This book is quite a bit better than Harris'. Daleiden writes in a more enjoyable tone, interacts with relevant philosophical literature, and displays a wide range of knowledge that he synthesizes skillfully. The particularly relevant parts of the book for wildists are part one, chapter thirteen, the appendices, and many of the works in the selected bibliography. The chapters on policy are also good, but conservationists with a tight schedule can probably get away with reading his analysis on just one of the issues.

***The Blank Slate: The Modern Denial of Human Nature* by Steven Pinker. Penguin Books (2003), 525pp. $20. ISBN 9780142003343.** — reviewed by John Jacobi

Pinker's book is the best one yet on the new sciences of human nature, even better than E.O. Wilson's *On Human Nature*. Pinker addresses much of the science, but his main goal is to quell the knee-jerk reactions and philosophical conundrums incited by it. He organizes the book into two parts, the first addressing "received dogmas" of the "ghost in the machine," the noble savage, and the blank slate, and the second addressing the ostensible threats of determinism, nihilism, imperfectability, and inequality. Pinker is obviously a humanist and does not argue in favor of wild nature, but his erudition lays the philosophical foundations for dealing with the problems of human nature, whether those problems are being sorted out by humanists, wildists, or others.

***Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* by Joshua Greene. Penguin Books (2014), 432pp. $18. ISBN 9780143126058.** — reviewed by John Jacobi

This book is Dr. Greene's proposal for a universal morality. Like *The Science of Morality* by Joseph Daleiden and *The Moral Landscape* by Sam Harris, two other prominent books on this topic, Greene advocates a version of utilitarianism as a "metamorality" that can unite the world's "moral tribes." Readers already familiar with sociobiological explanations of human nature and morality can mostly skip ahead to part three. (And those who aren't should try reading Steven Pinker's *The Blank Slate* and, again, skipping ahead to part three.) It is there that Greene offers his most interesting and original ideas, and offers a very good explanation of utilitarianism and rebuttals of common objections to it. Arguably the ideas are more thorough than even Daleiden's. Ultimately, Greene fails at his attempt for a universal morality, unable to sufficiently jump over the hurdles noted in the wildist critique of reason and progress, but as a forced universal morality becomes more important for an interconnected world, some version of Greene's proposal is likely to be the chosen and dominant one, so his ideas are well worth reading. Not only that, much of Greene's ideas are highly relevant to wildism. Note especially his "modular myopia hypothesis," and pay attention to his analysis of the different versions of the trolley problem. The latter may be useful in finding a possible moral distinction (or lack of one) between collapse happening and aiding collapse.

***Earth First!: Environmental Apocalypse* by Martha Lee. Syracuse University Press (1995), 298pp. $29.95. ISBN 9780815626770.**

In lieu of our own review, we suggest reading the following one, available online for free: Sessions, G. (1996). Martha Lee, Earth First!. *The Trumpeter 13*(4).

***The Moral Landscape: How Science Can Determine Human Values* by Sam Harris. Free Press (2010), 322pp. $16. ISBN 9781439171226.** — reviewed by John Jacobi

Compared to other books on the topic, this one only deserves a quick skim. It is useful for people being introduced to the arguments, but it largely ignores the problems inherent in any endeavor toward moral universalism, and it doesn't properly interact with even the most relevant philosophical literature. I also recommend Thomas Nagel's review. It doesn't line up with the foundational ideas of wildism, but it is worth chewing on. See Nagel, T. (2010). The facts fetish. *The New Republic*.

