

Darrel Moellendorf

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### **Progress, Destruction, and the Anthropocene**

The hope of reducing human toil is at least as old as the story of the curse of Adam.<sup>1</sup> Enlightenment era optimism that technological and educational developments offer a progressive path to plenty and liberation supports that hope. The Development Thesis defended by G.A. Cohen in the course of his interpretation of historical materialism is a piece of that Enlightenment optimism. The Development Thesis holds that productive forces tend to develop throughout history.<sup>2</sup> By “productive forces” he means something specific. Something is a productive force only if it is “a facility...capable of use by a producing agent in such a way that production occurs (partly) as a result of its use, and it is someone’s purpose that that the facility so contribute to production.”<sup>3</sup> This category includes the premises of production, the means of production, including raw materials and technology generally, and labor power, including strength, training, education, and science. Development of the productive forces increases the ratio of the size of the product of labor over the amount of labor required to produce it.<sup>4</sup> The idea that such an increase occurs as a result of the increase in productive forces and that it occurs according to human purpose entails that, as a general rule, an increase in productive forces promotes what we have reason to value, either more valuable goods and services or less effort spent working without satisfaction to get the goods. The tendency for such an increase in productive forces to occur is, according to the argument, due to persistent facts about human nature, comprising a need and capacity to increase productive forces—although the need could in principal be satiated. According to this view, human nature and our circumstances conspire to produce the tendency to fulfill human needs and desires. That sounds like a diagnosis and prognosis of social progress.

Now, of course, it is a major part of Cohen's purpose, and of the purpose of historical materialism generally, to give an account of the social barriers, to the general rule that increasing productive forces results in an improved human condition. I am not interested in assessing the merits of historical materialism however defended. My interest in Cohen's thesis is different. The mere fact of an increase in productive forces does not verify a tendency inherent in human nature. The increase could be due to happenstance. If, however, Cohen is right about the existence of such a tendency, we are in one important way a naturally a progressive species. But an increase in productive activity also results in the steady transformation of nature by humanity. That might be thought of as unambiguously good, as de-alienating from the vantage point of certain theoretical orientations inspired by Hegel or Marx, but surely it necessarily results in some loss of what we have reason to value.<sup>5</sup>

How do we reckon with natural destruction in a calculation of progress and of our progressive nature? The steady increase in productive forces has yielded the intended effect of satisfying human needs and wants; that is of enormous instrumental value. But the increase of productive forces has also had vast unintended effects. The mark left on the planet has been sufficiently pervasive and long-enduring (on a geological time scale) to suggest a new geological epoch, the Anthropocene. This is an era marked by the permanent destruction of non-human natural value. Is this progress or destruction, or both? And how shall we understand and appraise ourselves and our capacities that have brought this all about?

### **1. The Development Thesis**

The Development Thesis states that productive forces tend to develop throughout history. This might look like a straightforward empirical generalization, but it is not. The claim is not that productive forces have developed throughout history, but that there is a tendency for them to develop. A tendency to develop must be constituted by some kind of reliable mechanism. Hence, the defense of the claim needs to plausibly identify the

mechanism. The claim also is not that productive forces necessarily develop throughout history. So, although the mechanism producing development must be reliable, it need be neither the effective mechanism advancing productive forces in every instance nor invincible in its power. A tendency can be ineffectual or defeated. There is a tendency for the better team to prevail in football, but not always. So, the reliability of the mechanism that produces the development depends on the assistance of circumstances that are usually propitious. In that regard, if the Development Thesis is true, the tendency of productive forces to grow bears a resemblance to the tendency of tulip bulbs to bloom. Once a tendency has been identified, its realization is the norm, and cases of failure require special explanation. This suggests that the plausibility of the tendency will depend not just on identifying a possible reliable mechanism, but on the existence of a sufficient number of cases that the mechanism is supposed to explain. If the failure of the tendency to be realized is the norm, the existence of the tendency is called into question.

Cohen argues that there are three facts that constitute the tendency for productive forces to develop. He claims the following:

- (1) Humans are rational in the sense that insofar as they know how to satisfy compelling wants, they are “disposed to seize and employ the means” of doing so.<sup>6</sup>
- (2) The historical situation of humans is characterized by scarcity such that unless they spend the better part of their time engaged in labor, which is not experienced as an end in itself, they will not satisfy their wants.
- (3) Humans possess sufficient intelligence to enable them to improve their condition.

According to Cohen, these three facts plausibly constitute the tendency in the following way:

(2) suggests a durable reason to improve our circumstances; (3) states the ability to discern possible strategies for improvement; and (1) states that the strategies for improvement will be employed. Hence, humans are able “to effect cumulative improvements in their habitats, with each generation building on the achievement of its predecessor.”<sup>7</sup>

Each generation could not very well build on the achievements of the preceding one if the effort was to build beach sand castles, which the waves periodically washed away. There would be little evidence to verify a tendency towards more sophisticated design or less alienated labor in these circumstances. That suggests an incompleteness in Cohen's account that could be remedied by appeal to the following:

- (4) Circumstances must be such that when humans labor, improvements can be passed onto to at least some successor generations.<sup>8</sup>

Failing (4) there could be plenty of human intelligence and rationality directed towards production or labor savings in each generation, but not any tendency for the productive forces to grow intergenerationally since each generation would start anew. If the natural environment did not permit the products of our labor to be at least partially handed down to our descendants, there would be no tendency for productive forces to grow.

Cohen's argument that the three putative facts constitute a tendency for forces of production to develop has been criticized for employing a "transhistorical meaning for 'rationality' and 'scarcity', and thus a transhistorical notion of human beings' interests that likely cannot be sustained."<sup>9</sup> Andrew Levine and Erik Olin Wright contend that scarcity is not a transhistorical phenomenon but at least sometimes the product of relations of production. They invoke feudal European society. They doubt whether scarcity would have existed if there had been redistribution from the parasitic classes to the peasantry. And they contend that the incentive to improve production in feudal Europe came not from a rational desire to improve productive power under conditions of scarcity, but from military competition among feudal lords.

To glean a possible response available to Cohen, his argument for the Development Thesis must be further elaborated. He does not rest the case for the Development Thesis solely on the three assumed facts cited above but also on the following historical claim: Productive forces not only are rarely replaced by inferior ones but are frequently replaced by

better ones.<sup>10</sup> He then considers two possible explanans for that. One is based on social inertia: People adapt themselves to what they are used to. The second comprises the three alleged facts that constitute the Development Thesis. Social inertia could explain the lack of regression, but only the second explanans can explain why change in productive forces is typically in the direction of their development. So, the idea is that the three putative facts support the existence of a tendency of productive forces to develop. Such a tendency is further supported by the fact that productive forces rarely contract and normally expand.

This suggests two responses to Levine and Wright. First, the Development Thesis is consistent with historically local factors and explanations. Feudal military rivalries might result in the development of productive forces. But that need not be the only impetus for development. And scarcity under feudalism might have the features it does because of the way in which entitlements were distributed. Indeed, Cohen offers a response of that sort when he claims that, “while the tendency to productive improvement is realized if and only if there are recurrent particular instances of improvement, it does not follow that the explanation of each instance must be the tendency to improvement.”<sup>11</sup> Second, the Development Thesis’s primary explanatory power is not with respect to the expansion of productive forces at any given point in a society, but the long term trend in human history toward progress. Particular epochs and particular societies might facilitate or hinder the tendency, but the claim is that the tendency is at work in the long arc of human history.<sup>12</sup> In order, to explain that arc, an account that eschews transhistorical factors would have to patch together various accounts of tendencies towards development in various epochs. That would seem to leave only the fortunate conjunction of different historical tendencies, which have brought about the long term trend of rare regression and more common progression. A fortunate conjunction of events is not impossible. But unless there is independent reason to doubt the Development Thesis, it seems credible in light of its superior explanatory power.

Perhaps we don't have reason to count the kind of development characterized by the Development Thesis as progress. To consider that, we must understand better the concept of progress. I turn to that in the next section.

## **2. Progress**

The Development Thesis defended in the fashion of Cohen is not merely a claim about history. The claim that humans have a tendency "to effect cumulative improvements in their habitats, with each generation building on the achievement of its predecessor" takes us to be a progressive species. It is part of our nature, a consequence of our rationality and intelligence, given our circumstances, that we tend to improve our productive capacity. But since our nature itself is an evolutionary response to our environment, we could simply claim that it is part of our nature to improve our productive capacity. Unlike other earthly animals, progress is, as it were, written into our nature.

Such a bold claim cannot be fully assessed without greater clarity regarding the concept of progress. Let me begin by distinguishing the concept of progress and justice. The concept of progress applies to change for the better. Judgments of progress necessarily refer to conditions at two different times. Not so with justice. A judgment of justice might consider the claims of people at a particular moment. A finding of injustice involves comparing the circumstances of people with what they are owed, but not necessarily the circumstances of people at two different times. Still, it might be thought that social progress and justice are conceptually closer than the preceding comments suggest because justice is the metric of any plausible conception of social progress. Social progress then occurs when and only when the change produces an improvement for justice. But that seems too narrow a view of what progress might be. When a society is no more or less just than it was before, but people are healthier, better educated, and wealthier, in short when they have a higher level of human

development, that seems to be progress. So, plausible conceptions of social progress are not limited to justice.

I favor an ecumenical approach to conceptions of progress. A conception of progress picks out a change that we have reason to value. Conceptions might vary in several ways, by, for example, the change that is picked out or the time period over which they range. But change that we have reason to value is perhaps too broad a category. When the spring warmth brings crocuses that bloom, that's hardly progress, despite our reasons to value the lovely blooms and all that they portend. Plausible conceptions of progress must be more limited than that. There does not seem to be progress absent human causation. Should I slip and fall and thereby rattle my cell phone in a way that causes it to work more reliably, is the unintended benefit of my fall a mark of progress? It seems a stretch to consider accidental benefits to be instances of progress. When I luckily draw the right cards and thereby defeat my opponent, I have not improved my card game. But if I use my winnings to take lessons and thereby play consistently better, I have made progress in the game. The progress would not have occurred without the good fortune, but the accidental positive result, itself is not progress. Progress, then, may result in part from accidental causation, but not entirely from it.

What must the arc of progress be? Imagine a map with a curve moving from the lower left corner up to the right. The y axis represents the metric of progress, the x axis units of time. We do not need to specify the units since it is the concept of progress that is under discussion, not a conception applicable at some point in time. Now consider two questions:

1. Must each point on the curve be higher along the y axis than all previous points (as in Figure 1) in order for the curve to represent progress? Or does it suffice that the point on farthest to the right is highest of all (as in Figure 2)?
2. For any two curves representing progress, over the same period of time and from same starting point on the y axis, to same ending point, does the curve with the greatest area under it represent more progress?

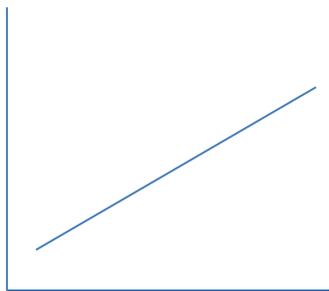


Figure 1

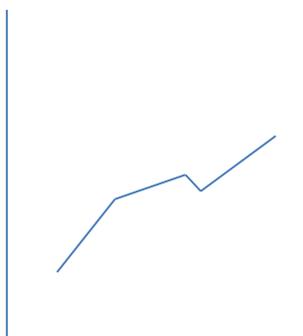


Figure 2

Answering the first question requires consideration of trade-offs and the point in time at which progress is judged. The second question raises issues of aggregation and maximization. The answer to question one may constrain the cases that can be considered in question two. For example, if a curve (see Figure 2) in which at least one point is lower than at least one point to its left (even if the farthest point on the right is highest) does not represent progress because of the dip, then consideration of question two will not allow the comparison of a curve that contains such a dip but then proceeds upward again, even if the area under it is greater than other curves to which it is compared.

William Nordhaus offers an example that can shed light on some aspects of both questions. His climate wrinkle example is a case in which one generation's well-being is sacrificed (let's assume that it falls below the well-being of at least one previous generation) but the well-being of subsequent generations improves: "Suppose that scientists discover a

wrinkle in the climate system that will cause damages equal to 0.1 percent of net consumption starting in 2200 and continuing at that rate forever after. How large a one-time investment would be justified today to remove the wrinkle that starts only after two centuries?"<sup>13</sup> The dip in the curve in Figure 2 could represent such a one-time investment to prevent a climate wrinkle.

To the first question. Let's refer to the time at which the generation takes the hit as " $t$ ," represented by the dip point on Figure 2. Let " $t-1$ " and " $t+1$ " refer to the immediately preceding and succeeding times. Moreover, let " $G_n$ " represent the generation at  $t$ , which takes the hit, and " $G_{n-1}$ " and " $G_{n+1}$ " refer to the immediately preceding and succeeding generations at  $t-1$  and  $t+1$  respectively. Finally, let the y axis represent the well-being of each generation.  $W_G$  refers to the well-being of a particular generation. In filling out the example, we assume, as in Figure 2, that right end point of the curve is higher than the left beginning point. At  $t$  one might have no confidence in an upward trend; especially if  $W_G$  is very far below  $W_{G-1}$ . At that point then it would seem implausible to predict that additional progress would ensue. Did progress end at  $t-1$  just before the dip? If so, from the perspective of a generation at the end of the curve, one could speak of two separate periods of progress, one ending at  $t-1$  and the other beginning at  $t+1$ . Alternatively, in light of the whole curve, perhaps we might claim that progress did not end at  $t-1$ ; rather, there is a single progressive curve.

Two questions must be distinguished. The first is what is the correct judgment at  $t$ ? The second is what is the correct judgement about the whole curve, from the point of view, as it were, of a person at the end point? Regarding the first question: Since  $t$  is the point furthest to right, and since it is not highest of all, it would be wrong to describe the curve segment up to  $t$  as representative of progress. The curve segment from  $t-1$  to  $t$  represents a regressive period. Progress stopped at  $t-1$ . But in similar cases assuming that at  $t$  one is not at the end of the process of change, hope for renewed progress is often not false. Assuming, as we do, that the whole curve ends with the end point being higher than all other points, it seems reasonable

to claim that the curve represents progress on the whole. Progress on the whole would end when the curve begins to decline and fails to regain a position on the y axis that is higher than all previous points. In a period of regression, after the curve has reached its high point, there could be segments of regress and progress.

According to the forgoing conception of progress, a judgment of progress for circumstances represented by a curve segment (including the whole curve) requires that the point of reference be higher on the y axis than all other points. That is a more permissive conception of progress than the following strict conception: A judgment of progress for a period change represented by a curve segment requires that every point of the curve segment be higher than all preceding points. The strict conception takes progress to come in fits and starts but does not allow a “grand narrative” of progress if there are dips. In any period of dip, one can say definitively that progress has come to an end. There may be a new period of progress but is it discontinuous with earlier periods. The problem with the strict conception, however, is that it fails to answer plausibly the following question: Why doesn't the curve, with an end point that is higher than all preceding points, represent progress over all? The answer according the strict conception is that periods of setback end progress. But that seems inadequate if the question is about the trend overall. With respect to the overall trend the existence of setbacks seems irrelevant.

Similar to Aristotle's claim that a person's life cannot be judged happy till it comes to an end, so according to the more permissive conception of progress, a path of change cannot be confidently judged as progressive until it has finally run its course.<sup>14</sup> Definitive retrospective judgments of the arc of history would be possible only at the end, if anyone were around to give them. Epistemically that's the bad news. The good news is that there may grounds to hope for progress where belief cannot be adequately justified.

The second question above was about how to make comparative judgments of progress. Suppose a society could choose between two development paths, from the same

starting point, over the same time period, and with the same ending point (and, of course, that the right end point of the curve is higher than the left beginning point). So, both paths are progressive. See Figure 3.

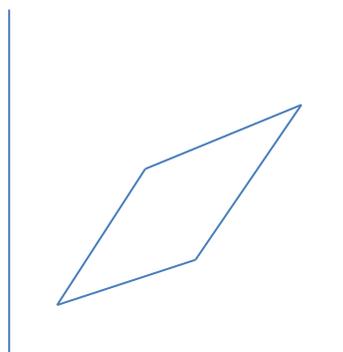


Figure 3

If progress is measured by the amount of increase in what we have reason to value, then neither curve represents greater progress. For they both start and end at the same point on the y axis. But there are reasons to value some paths of progress more than others that are independent of how much progress occurs. In other words, progress can be better even if not necessarily greater. A course of change that provides more of what is valued sooner (as represented by the top curve in Figure 3), will provide more of what is valuable over all. It could be represented by a curve with greater area under it as in Figure 3. All else being equal, there is greater reason to pursue such a path since it provides more of what is valued. And, although the curves represented above do not represent how what is valued is distributed at any given time point, egalitarians and prioritarians will have reason to value more a path of progress that distributes more of what is valued to those who have less.

Whether the development of productive forces constitutes progress according to the more permissive conception of progress seems to require a judgment about whether it results in more of what we have reason to value. And because we have reason to value not only productive forces, the judgment must be an all-things-considered one. Making it requires

considering also the value destroyed by the growth of productive forces. I discuss that issue in the next two sections.

### **3. Development and Destruction**

Our concern is not only with kind of progress that the development of productive forces is, but also with an all-things-considered judgment about a tendency towards progress resulting from our nature in light of the destruction of non-human natural value that occurs as a result of the increase in productive forces. The kind of destruction that is especially relevant to our discussion of the development of the forces of production is the human caused elimination of what we have reason to value. Destruction of this sort, unlike progress, need not be intentional. Loss of value, regardless of intention, is destruction. When I slip, fall, land on my cell phone, and it no longer works as a consequence, there has been as much destruction as when the malfunction had occurred because someone had smashed it with a hammer.

One manner in which destruction occurs as a result of the development of productive forces is through the consumption of greater quantities of raw materials for increased production. The extinction of species, the elimination of natural habitats, and the depletion of natural resources are instances of such destruction. Another manner in which destruction occurs is through the despoliation done to natural systems by the introduction to them of the waste that results from production and consumption.

Although at the time of the writing of this paper final scientific determination is still pending, the scientific case for the Anthropocene as a distinct geological era is mounting.<sup>15</sup> The evidence of human alteration includes a stratigraphic human signature on sediments and ice, including abundant “technofossils” composed of concrete and plastic elements, the waste arising from the use of new materials, and the worldwide dissemination of black carbon, inorganic ash spheres, and spherical carbonaceous particles, which are remainders from the

burning of fossil fuels. Geochemical signatures from the use of fertilizers include soil nitrogen and phosphorus levels in lake strata and Greenland ice that are higher than at any time in the last 100,000 years. Atmospheric concentrations CO<sub>2</sub> and CH<sub>4</sub>, due the burning of fossil fuels, exceed those of those Holocene era, and average temperature increase and sea-level rise since 1850 exceed Holocene fluctuations. Extinctions rates are now far above background rates since 1500 and “invasions and changes associated with farming and fishing, [are] permanently reconfiguring Earth’s biological trajectory.”<sup>16</sup>

Can it be reasonably claimed that the changes that are constitutive of the permanent alteration of the planet amount to destruction? After all, in nature all is in flux; in the long view of things atmospheric chemistry alters, ecosystems change, and species come and go in a Heraclitean flux. πάντα χωρεῖ. Equilibrium points are only pauses in a very long process of change. And a measure of harm requires a baseline of comparison. If there is no fixed baseline, how is the harm to be measured? When species go extinct due to human development, it might seem reasonable to claim that the ecosystem has been adversely affected, but the system itself is changing in any case.

Harm need not be measured only against a fixed baseline. It can also be measured against a vector of change. When a boot crushes a budding plant, the effect can be compared to the direction of change the plant might have taken but for the force of the boot. The example is compelling in part, however, because the vector of change is known. Unlike the bloom-producing process of a particular species of plant, the direction in which ecosystems and other natural systems are changing is often unpredictable. How can harm to such a dynamic system be identified? *Via negativa* seems a plausible approach. We need not know the exact direction of change to be sufficiently confident that it would not have been as it is after anthropogenic forcing. It is implausible that natural forces would have produced exactly the same outcome. Destruction can in that way be appreciated, even if not exactly measured. When a habitat is destroyed and a species that once lived in the habitat goes extinct, it is

normally not epistemically heroic to attribute the extinction to the habitat loss, even if over a longer period the eco-system in the region might have registered changes.

Even if the *via negativa* approach makes sense in particular instances, perhaps it is inadequate on a global scale. The skeptic might claim that, like the effects of climate change, attribution of destruction to the Anthropocene is often not possible; there are simply too many variables to fix attribution with a sufficient degree of probability to the Anthropocene. There are two problems with that skeptical challenge. First, attributing destruction to the Anthropocene is simply shorthand for attributing it to the various anthropogenic processes that constitute the Anthropocene. So, for example destruction might be attributed to climate change, rather than the Anthropocene writ large. Second, whether we can attribute the destruction with a high degree of probability to an anthropogenic process will vary and our powers of attribution may increase as the science becomes better. It might be difficult to attribute a particular drought to climate change, but there is little doubt that ocean acidification, which causes coral reef bleaching is caused by CO<sub>2</sub> in the atmosphere. And increasingly it is possible to attribute to climate change the additional risks of severe weather events.<sup>17</sup> As a general criticism the skeptical challenge is implausible. In any particular case of perturbations to a natural systems, the ability to attribute it to anthropogenic processes will vary. But at least sometimes, there is sufficient reason to believe that the outcome is due to the various processes that constitute the Anthropocene.

#### **4. Natural Value**

Various parts of non-human nature—not necessarily reducible to individual organisms—are intrinsically valuable. They are valuable not merely insofar as they contribute to other values.<sup>18</sup> Standing at the edge of the Grand Canyon one is overcome by awe before its immensity and one experiences delight in the beauty of the color of the rocks. The riot of birdsong while walking through woods is enjoyable. The relative equilibrium of an ecosystem

maintained by relations of predation and mutuality presents a complexity and unity that is wondrous. Coming to understand an individual organism as a store of genetic information passed on through billions of years of evolution is amazing. The awe, delight, enjoyment, wonder, and amazement are not merely, or even mainly, expressions of the value of a non-human natural items or systems because of their contribution to something else that is valuable. Rather, these are all experiences of appreciating the intrinsic value of that which is experienced. Some writers lay stress on the importance of the attitude of respect in appreciating the intrinsic value of nature.<sup>19</sup> Such stress, I believe, is either too narrow or imprecise.<sup>20</sup> As the examples of above suggest, there are a variety of attitudes appropriate to the recognition of intrinsic value generally, and to the intrinsic value of non-human natural items and systems in particular.

An element—although certainly not all—of what is valuable in each of the items or systems mentioned above is that it is a product of non-human natural forces.<sup>21</sup> An immense ditch of approximately the same size as the Grand Canyon dug in the desert surface would not elicit the same response; equilibrium may be an interesting feature of certain social systems, but that it can come about in eco-systems by impersonal forces merits a different kind of appreciation; biotechnology can produce compounds that are worthy of study and learning, but not without a rich understanding of natural compounds. It is not a question of the *amount* of value in items that come to be through non-human natural forces in comparison to the amount value in artefacts. I am not asserting that nature is more valuable than culture. Nor am I supposing that there is a common currency of value by which all of these valuable items can be priced. My claim is rather, and only, that the items that are the objects of the experiences in the previous two paragraphs are valued in part because they do not derive wholly from human intention or accident.

I claim that these non-human natural items and systems have intrinsic value. Some writers supplement this with the claim that the appreciation of such value is partially

constitutive of human well-being or flourishing. This makes the argument for the importance of non-human natural value more robustly anthropocentric. And it ensures that preservation is a matter of moral concern. Building up from an argument about the value of natural processes, Robert Goodin goes on to claim that “natural processes, and our relation to them, serve to fix our place in the external world” and to locate ourselves “in a deep psychological sense that matters enormously to people.”<sup>22</sup> In contrast, I stop at affirming the intrinsic value of certain non-human natural items and systems. The anthropocentric addition is controversial since the role of natural value varies a great deal among reasonable conceptions of human flourishing. Moreover, my argument does not rely on the claim that the preservation of non-human natural value is a moral duty. It is enough to establish that non-human natural value is valuable independent of any contribution it makes to other valuable items. In this case less (anthropocentrism) is more (plausible).

If it is the case that part of the value of the items under discussion is that they do not derive wholly from human intention or accident, then a certain kind of humility seems to be to some extent an appropriate response to their value. In valuing them we are appreciating that they are not wholly human artefacts. We could not produce the same kind of valuable item, if we tried. The kind of humility that I am speaking of is not the recognition of a defect in our nature, sometimes appealed to as a Christian virtue.<sup>23</sup> Nor does it involve taking a point of view in which humans do not matter.<sup>24</sup> It is rather the appreciation of a limitation. Some of what we value, we value in part because we could not produce it. No sane person doubts that some of what we value is not created by us. If there is controversy about this sort of humility, it must be due to the reason why we value what is not created by us. Could it be that one reason is *because* it is not produced by us? A survey of items of the kind listed above, I think, supports that conclusion. Consider a ditch dug in the desert, a series of computer generated tones varying in pitch and meter, a piece of nano-technology. None of these is valuable in the

way that the Grand Canyon, birdsong, or a micro-organism is. And that seems to be because the former are artefacts, and the latter are not, or at least not wholly.

Non-human natural items or systems might be thought of as elements that comprise states of affairs of the world. Some theories of value affirm the view that the appropriate action regarding all intrinsically valuable states of affairs is to promote them.<sup>25</sup> If what I have been arguing is right, that view must be false. The appropriate response to intrinsically valuable non-human natural items and systems cannot be for us to promote them since it is a constitutive element of their value that they come to be not by human intention or accident. Care, protection, preservation, limited use, and restoration all seem to be better candidates for the kinds of actions appropriate to the intrinsically valuable non-human natural items and systems.

Are such experiences of awe, delight, enjoyment, wonder, amazement, and humility veridical? Perhaps such experiences deceive us because nothing of intrinsic value is really experienced. I would like to avoid as much as possible meta-ethical questions about the objective or mind-dependent nature of that which is valued intrinsically. Regardless of whether the intrinsic values are “out there” supervening on natural facts or whether they are expressive responses to natural facts, the experiences can be veridical enough for their relation to natural facts to be so fixed that anyone would have reason to have such a response. In other words, the experiences are veridical if it is the case that there are norms that require them regardless of whether the force of the norms is due to objective circumstance or human constitution. The relevant question then to ask is whether, for example, one has a reason to respond with awe and delight when facing the Grand Canyon. And there is, I think, no way to establish that one should so respond other than to point to the natural properties of the Canyon that seem worthy of awe and delight.<sup>26</sup> The art historian cum naturalist, John C. Van Dyke, once described the Canyon this way:

The rock forms are florid, fantastic, flamboyant, and yet planned on so vast a scale that they are impressive and commanding through sheer mass. The colors are hectic, sky-flushed, fire-fused, perhaps leached and bleached by rain or flung off in vivid tones by blazing sunlight. Sometime a vermilion-red glows beside a fire – green, while at other times, so subtle is the blend that you cannot draw line between gold and orange or purple and mauve.<sup>27</sup>

Van Dyke captures the experience well, and his description highlights the many properties of the Canyon that gives us reason to experience awe and delight.

Are all of the products of non-human natural forces intrinsically valuable to some extent? Cohen claims that, “If an existing thing has intrinsic value, then we have reason to regret its destruction *as such*, a reason that we would not have if we cared only about the value that thing carries or instantiates.”<sup>28</sup> But if universal vaccination led to the elimination of poliovirus in the wild, that would be a most welcome outcome and a reason for rejoicing. In light of that example, we might want to take back the claim that all products of non-human natural forces are intrinsically valuable. Is that the only plausible conclusion to draw? There are two other possibilities. Perhaps all products of non-human natural forces are intrinsically valuable, but either, contra Cohen, not all destruction of things that are intrinsically valuable is a reason for regret, or even when we have reason for regret, we have might have overwhelming reason for rejoicing. Now, there is nothing incoherent about claiming that although we have reason to value something intrinsically that reason is so much outweighed by its instrumental disvalue that we have reason to destroy it. For example, when we euthanize a rabid dog it is not because it is not intrinsically valuable. In the case of the dog it seems clear that we also have reason to regret our destructive action, even though we have sufficient reason to do it. But there is no reason for rejoicing in that example. When fascism was militarily defeated in Europe there was reason for rejoicing and for regretting the moral costs incurred. There is nothing incoherent about thinking that even when we have greater

reason to rejoice, we may still have reason to regret. To think otherwise would be to think that we live in world in which the good gained never comes at a price that we would like not to have had to pay. That does not seem to be our world.

I have claimed that surveying various things that are intrinsically valuable gives us reason to believe that part of their value is that they are not human artefacts. If that conclusion is true, then the case of the poliovirus forces us to conclude either that Cohen is wrong about the reasons for regret whenever something intrinsically valuable is destroyed or that there may be cases in which the reasons that we have to regret the destruction of a valuable item are so weak (although extant) in proportion to the instrumental disvalue of the item as to be in practice inconsequential. In these cases, it would be odd to criticize a person who did not have the feelings of regret appropriate to the destruction of intrinsic value. It seems implausible to claim that someone feeling no regret at the destruction of the poliovirus should be for that reason criticized. We need not decide between these two possibilities here since we are mainly interested in cases in which the intrinsic value of the natural item is not accompanied by massive instrumental disvalue. In that case the reason for regretting the destruction of the item will be strong and important in practice. In such cases agreement about whether progress has occurred may seem particularly difficult to obtain. I discuss that problem in the following two sections.

## **5. Progress, Destruction, and Commensurability**

The development of productive forces would be a kind of progress if we had reason to value their development. I believe we do have such reason. The development of productive forces allows us to have more or better goods and services that we value or to have them with less labor, which historically has for most people not been an activity of intrinsic value. Rather, it has been labor done usually out of a need to survive and with little to no control over its conditions. The development of productive forces is then instrumentally valuable

insofar as we value that which is produced or disvalue the wearisome or alienated labor typically required to produce it.

If the development of productive forces is an instance of progress, is the all-things-considered judgment of progress falsified by the destruction of non-human natural value which is caused directly or indirectly by the development? Recalling the maps in Section 2, would the slope of the curves flatten or become negative if the destruction of natural value were factored in? If the progress and destruction could be compared on a common metric a commonly accepted answer to the question could be given. One approach to valuing natural systems, the ecosystem services approach, could allow for such a comparison. Let's suppose that the growth in productive force can be measured in terms of the economic value of the products generated plus the value, measured, say, in the willingness-to-pay in foregone production, for any reductions in labor afforded by that growth. Now if the natural value destroyed could be adequately captured in the monetary value lost due to the loss of ecosystem services, then the extent to which the development of productive forces were progressive could be measured. Imagine a map in which the y axis would be the net economic value of the added value due to the growth of development forces minus the loss of value due to the destruction of ecosystem services. Progress would exist as long as the value of the growth in productive forces minus the disvalue of the loss of ecosystem services yielded a curve with a left most point higher than every point to the right.

There is, however, a fundamental problem with asserting that natural systems are valuable simply as services that can be priced. For that is to take these systems as merely instrumentally valuable; it is to ignore their intrinsic value. Marx is making a more sweeping claim (perhaps too sweeping) than I am, but one that also rejects the mere monetarization of nature, when he claims that "The view of nature that has obtained under the domination of private property and money is the actual despising of and degrading of nature."<sup>29</sup> To assume that the value non-human natural items and systems can be fully captured in terms of

monetary value is to fail to appreciate their intrinsic value. It is to misvalue them, or to incompletely value them.

Another means by which progress in the form of the development of productive forces and the destruction of non-human natural value might be compared on a common metric is if the latter causally counteracted the former. In this regard, recall the claim that I defended in Section 1. The tendency of the forces of production to develop requires the following:

- (4) Circumstances must be such that when humans labor, improvements can be passed onto to at least some successor generations.

One of the effects of the destruction of non-human nature that constitutes the Anthropocene is to weaken to some extent the capacity of the natural environment to preserve improvements for subsequent generations. Think of the potential of climate change to turn back advances in the development of productive forces through the destruction of infrastructure wrought by more intense tropical storms, or the destruction of agricultural yields due the salinization of soil from sea level rise and more frequent and longer periods of drought.

In cases such as those mentioned in the previous paragraph, the destruction of natural value may to some greater or lesser extent counteract the tendency of productive forces to develop over time. Insofar as those counteracting forces are themselves the unintended consequences of a certain path of development of the forces of production, any tendency toward progress might be weakened. Lack of sufficient foresight could ultimately undermine the plausibility of the Development Thesis. If rationality and intelligence are not brought to bear in sufficient time to avoid the worst effects of anthropogenic climate change, productive capacity could be substantially undermined. It could be far too early for us to tell whether we are a species progressive by nature.

The two comparisons of the development of productive forces and the destruction of non-human natural value just surveyed differ in one important regard. The first calculates a disvalue for the destruction of non-human natural value in monetary terms and subtracts it

from the monetary value of the development of productive forces. The second comparison, in contrast, does not calculate any disvalue of the destruction of non-human natural value. Rather, it calculates the disvalue of the effects of that destruction on the monetary value of the growth of productive forces. The second comparison does not misvalue non-human natural value; it simply does not assign any value to it. There is then no disvalue to natural destruction in the absence of effects on the forces of production. The two approaches are instructive for efforts to develop an accounting method that takes into consideration the destruction of natural value when assessing progress in the development of productive forces. In order to render the value of the growth of productive forces comparable with the value of non-human natural items and systems, one either assigns a value to the latter that fails to capture its intrinsic value or assigns no value to the latter and measure its destruction solely in terms of the effects it has on the growth of productive forces. If these two approaches exhaust the possibilities, then an adequate accounting method is not available.

There is a further reason to doubt the availability of an adequate accounting method for a broadly acceptable all-things-considered judgment of progress in the present case. Something of instrumental value is valuable to the extent that it contributes to or makes possible something else that is valuable. One constituent feature of the value of non-human natural items and systems is that they do not derive wholly from human intention or accident. No human action, then, can be instrumentally valuable to the production of that part of the value of these items and systems. Hence, the instrumental value of productive forces cannot be in its contribution to the production of that part of the value of valuable non-human natural items and systems. If that part of the value of the intrinsic value of non-human natural items and systems is not captured by valuations of productive capacity, and if productive capacity cannot be instrumentally valuable to the production of natural value, then there is compelling reason to doubt that there can be a common metric against which the intrinsic value of non-

human natural items and systems and the instrumental value of the growth of productive forces can be measured.

A central problem for assessing whether the development of productive forces over time is all-things-considered progressive is that this progress has also wrought the destruction of intrinsically valuable non-human natural items and systems, but there is no prospect of measuring the full disvalue of the latter against the value of the former. That is the source of a basic problem for rational agreement about progress, but it does not necessarily render individual judgment irrational. The absence of a metric against which to measure a loss of one kind valuable thing against a gain of another does not entail that every evaluation is irrational. A thorough evaluation of whether there has been progress will interrogate the evidence and judge it against what we have reason to value. Insofar as the latter include values that cannot be compared on a common metric, evaluations may vary depending on the weight given to the values. These different evaluations may nonetheless be rational if there is no reason that should compel one to reject her evaluation in favor of another. The absence of a common metric of comparison makes it possible that people might hold different evaluations without either having a reason that should compel her to give up her evaluation in favor of the evaluation held by another person.<sup>30</sup> In assessing the full value of the development of productive forces over time, then, people may disagree because there is no metric of valuation.

## **6. The Possibility of a Map of Progress**

The assessment of progress is important for our understanding of the character of our projects and, insofar as the putative progress derives from aspects of our nature, for an understanding of who we are. The arguments above suggest principled limits to agreement about both kinds of understanding when judging the value of the development forces of production against the disvalue of the destruction of non-human natural items and systems.

According to the arguments of Sections 4 and 5, when it comes to assessing progress in the development of productive forces, any map of progress such as those is in Section 2 would be necessarily misleading. A curve that represents the development of the forces of production over time by subtracting the disvalue of the destruction non-human natural items and systems from the value of the development of productive forces does not accurately account for the loss of intrinsically valuable non-human natural items and systems.

Perhaps an alternative map in which both kinds of values are represented does a better job. The map in Figure 4 represents two indifference curves.

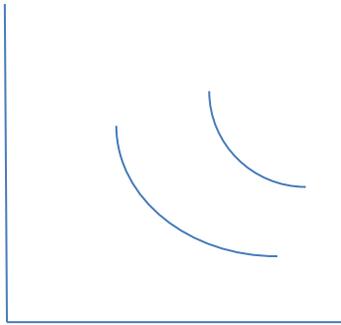


Figure 4.

Suppose that the y axis represents forces of production and the x axis the preservation of non-human natural items and systems. Suppose further that a person has a rational weighting of the values of growth in productive forces and the preservation of natural values that is represented by the indifference curve on the left. That person should judge progressive a social change that makes possible a schedule of trade-offs of the kind represented by the right hand curve. However, by the arguments in Section 5, for multiple people there may be multiple rational schedules of weighing of the values of growth in productive forces and the preservation of non-human natural values. Therefore, there may be multiple curves representing those schedules. There could not be as many curves as the set of all possible indifference curves since absolutism with respect to either the instrumental value of the forces of production or the intrinsic value of non-human natural items and system would be unreasonable. Although a curve could approach either axis asymptotically, it could not

intersect or be tangent to it. For that would be inconsistent with the reasons we have to value instrumentally the growth in productive forces and to value intrinsically non-human natural items and systems. Still, within those constraints perhaps any curve is in principle a possible representation of rational trade-offs.

If we have reason to value the development of productive forces and to disvalue the destruction of non-human natural items and systems, then in policy discussions there would seem to be reason to pursue the kind of policies that both do not slow the development of productive forces and preserve more natural value. When economists argue that climate change mitigation is optimal in comparison to non-mitigation, they are arguing that mitigation policies are of that kind.<sup>31</sup> When policy makers stress the conservation gains from certain kinds of community development programs involving eco-tourism, they are making proposals of that kind.<sup>32</sup> And when Aldo Leopold advocated keeping wild the idle strips bordering farms and highways, he was making a proposal of that kind.<sup>33</sup>

The win-win policies mentioned in the previous paragraph suggest a different possible way to map progress. There may be a range of policies that make improvements to one category of value without destructions in the other. That can be represented as rectangle on the map with y axis representing productive forces and the x axis the preservation of non-human natural items and systems.

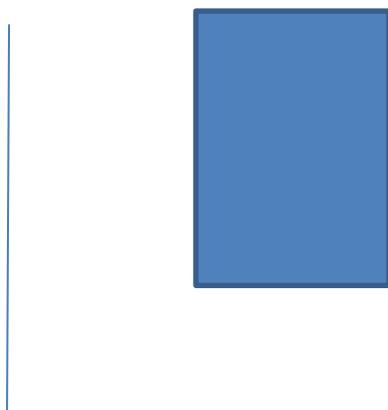


Figure 5

In Figure 5 any change from the point at the lower left hand corner of the rectangle to any other point within or on the perimeter of the rectangle should be judged an improvement. Perhaps progress over time could then be represented by a series of connected maps. The point of improvement within or on the perimeter of the rectangle could become the lower left corner of a new rectangle, and so on.

Although Figure 5 maps the space of win-win policy proposals from a given status quo—represented as the point of the lower left hand corner of the rectangle—a series of connected maps of that sort would be insufficient as a map of progress. Representing a space of possible win-win policy proposals represents the possible improvement against the status quo. It is open to any critic with rational weightings of the instrumental value of the forces of production and the intrinsic value of non-human natural items and systems to reject that starting point. According to the argument of Section 5, there does not seem to be grounds for criticizing the schedule of trade-offs she makes. We can understand this by imagining that the status quo cannot be represented as point on an indifference curve (like those represented in Figure 4) that she endorses. A rectangle of the sort represented in Figure 5 with the lower left hand corner representing the status quo point will not then cover the identical area as a rectangle whose lower left hand corner is one on a curve of a schedule of rational trade-offs that she endorse. In that case a move made to a point within the rectangle based on the status quo point will not necessarily be a move to a point within a rectangle that has the lower left hand corner as a point along her indifference curve. Since a plurality of curves representing rational trade-offs is possible, a plurality of a series of nested rectangles is possible. In principle there may be multiple maps of progress when the relevant values are the development of productive forces and the preservation non-human natural items and systems.

## **7. Closing Remarks**

We have reason to value prosperity and freedom from toil. But non-human nature also presents us with a magnificent treasure of wonder and beauty. And insofar as a path to wealth and freedom from alienated labor depletes and despoils that treasure we have reason to regret that path. The present destruction of non-human natural value might yet undermine the basis of our prosperity. In that case agreement that we are not on a path of progress would be easy. Failing such a decline in the forces of production, there is room for a plurality of rational evaluations of our path and our progressive nature. The source of this plurality of evaluations is a pluralism of values having no common metric.

The picture, however, need not be one of irreconcilable conflict between two domains of value. Since the development of productive forces can be productive of more or better goods and services with same amount of work but also of the same value of goods and services for less work, there is no reason to think that progress in the development of the forces of production necessarily increases the depletion or despoliation of valuable natural items or systems. Indeed, the ratio of the size of the product to the amount of labor can continue to increase even as the size of the product falls, as long as the amount by which labor is reduced is sufficient. So, a tendency for the productive forces to increase is in principle consistent with less depletion and despoliation. The age of the Anthropocene could perhaps yield a world-historical reconciliation between the forces of production and destruction.

In a world still marked by desperate poverty, however, efforts to increase overall production rather than reduce labor have compelling moral weight. To take just one example, there must be a dramatic increase in the production and distribution of energy and modern cooking fuels in order to eradicate the worst forms of poverty. Even when the expansion of production is necessary to achieve morally mandatory aims, like poverty eradication, appropriate regard for the intrinsic value of non-human natural items and systems requires us to seek means that are not carelessly destructive. Still, it would be incredible to believe that

the achievement of the noble aim of poverty eradication, assuming we achieve it, will not also be an occasion to regret the non-human natural value destroyed along the way.

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<sup>2</sup> G.A. Cohen, *Karl Marx’s Theory of History: A Defence*, expanded ed. (Princeton: Princeton University Press, 2001) 134.

<sup>3</sup> *Ibid.*, 32.

<sup>4</sup> *Ibid.*, 57.

<sup>5</sup> For a version of the de-alienation view see Steven Vogel, *Thinking Like a Mall* (Cambridge, MA: The MIT Press, 2015) 90-94.

<sup>6</sup> Cohen, *Karl Marx’s Theory of History*, 152.

<sup>7</sup> *Ibid.*, 152-53.

<sup>8</sup> I would like to thank Simon Caney for a discussion about how to formulate this idea.

<sup>9</sup> Andrew Levine and Erik Olin Wright, “Rationality and Class Struggle,” in Alex Callincos, ed., *Marxist Theory* (Oxford: Oxford university Press, 1989), 37.

<sup>10</sup> Cohen, *Karl Marx’s Theory of History*, 154.

<sup>11</sup> G.A. Cohen, “Forces and Relations of Production,” in *History Labour and Freedom* (Oxford: Oxford University Press, 1988), 21.

<sup>12</sup> See *Ibid.*, 26.

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<sup>13</sup> William Nordhaus, *A Question of Balance: Weighing the options on global warming policies* (New Haven and London: Yale University Press, 2008), 182.

<sup>14</sup> Aristotle, *Nicomachean Ethics* 1100a5. See *Nicomachean Ethics*, H. Rackham trans. The Loeb Classical Library, Aristotle XIX, (Cambridge: Cambridge University Press, 1982), 47.

<sup>15</sup> See Colin N. Waters, et al., “The Anthropocene is functionally and stratigraphically distinct from the Holocene,” *Nature* 351, no. 6269, (2016): 137-47. DOI: 10.1126/science.aad2622.

<sup>16</sup> *Ibid.*, 137.

<sup>17</sup> Allen Thompson and Frederike E.L. Otto, “Ethical and normative implications of weather event attribution for policy discussions concerning loss and damage,” *Climatic Change* 133. No. 2 (2015) 133: 439-451.

<sup>18</sup> these the first conception of intrinsic explicated by John O’Neill in his “The Varieties of Intrinsic Value,” *The Monist* 75, no. 2 (1992): 119-37.

<sup>19</sup> See Paul Taylor, *Respect for Nature: A Theory of Environmental Ethics* 25<sup>th</sup> Anniversary ed. (Princeton: Princeton University Press, 2011) and Dale Jamieson, “Climate Change, Responsibility, and Justice,” *Science and Engineering Ethics* 16, no. 2 (2010): 431-45.

<sup>20</sup> See also chapter two of my *The Moral Challenge of Dangerous Climate Change: Poverty, Values, and Policy* (Cambridge: Cambridge University Press, 2014).

<sup>21</sup> See also Robert Elliott, *Faking Nature* (New York Routledge, 1997). Unlike Elliot I do not claim that non-human natural value is a source of moral obligation to nature.

<sup>22</sup> Robert E. Goodin, *Green Political Theory*, (Cambridge: Polity Press, 1992), 39.

<sup>23</sup> See Augustine, *The City of God against the Pagans*, ed. and trans. R.W. Dyson (Cambridge: Cambridge University Press, 1998), bk. 14, chp. 13, 609 in which humility is defended as a response to turning away from God and as the chief virtue of the City of God..

<sup>24</sup> In contrast to Stan Godlovitch, “Icebreakers: Environmentalism and Natural Aesthetics,” *Journal of Applied Philosophy* 11, no. 1 (1994): 15-30.

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<sup>25</sup> This is how T.M. Scanlon characterizes teleological conceptions of value in *What We Owe to Each Other*. (Cambridge, MA: Harvard University Press, 1998), 80.

<sup>26</sup> See also Scanlon's buck-passing account of value in *What We Owe to Each Other*, 96-98.

<sup>27</sup> John C. Van Dyke, *The Grand Canyon of the Colorado: Recurrent Studies in Impression and Appearances* (New York: Charles Scribner and Sons, 1920), 6.

<sup>28</sup> G.A. Cohen, "Rescuing Conservatism: A Defense of Existing Value," in *Finding Oneself in the Other* (Princeton: Princeton University Press, 2013), 153.

<sup>29</sup> Karl Marx, "On the Jewish Question," in David McLellan, ed., *Karl Marx: Selected Writings* (Oxford: Oxford University Press, 1977), 60.

<sup>30</sup> See also Joseph Raz, *The Morality of Freedom* (Oxford: Oxford University Press, 1986), 339.

<sup>31</sup> See Nordhaus, *Balance* and Nicholas Stern, *The Economics of Climate Change, The Stern Review* (Cambridge: Cambridge University Press, 2007).

<sup>32</sup> David Schmitz, "When Preservationism Doesn't Preserve," *Environmental Values* 6, no. 3 (1997): 327-39.

<sup>33</sup> Aldo Leopold, *A Sand County Almanac, with Essays on conservation* (Oxford: Oxford University Press, 2001), 85.