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An Ecological Critique of Capitalism

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An Ecological Critique of Capitalism

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Abstract

I will be addressing the broad set of impacts generally referred to as "the environmental crisis." I argue that this environmental crisis is truly an *ecological* one, insofar as humans are its primary drivers as well as its primary victims. I then investigate the structural cause (or structural causes) which produce this multitude of effects. In turn, this leads me to seek out and address the social underpinnings of this problem. I identify capitalism (specifically, its current form of global neoliberal economics) as a major driver of the ecological crisis and explore the relationship between capitalism and environmental practice. As such, "capitalism" must be broken down into its constituent parts and internal logics. The relevant aspects of this relationship I will address include: capitalism as a process (always in flux, always growing and accumulating, always transcending boundaries), capitalism as a mode of social organization (biopolitics—structuring the way we live in society; economism—structuring the way we talk about, think about, and understand relationships), and the resistance of nature to commodification (nature being broken down from a cohesive whole and commodified). I will not only explicate the internal inconsistencies of capitalism in relation to environmental sustainability, but I will also discuss a few neoliberal attempts at remediating the ecological crisis and how these are ultimately counterproductive. Lastly, I will explore "political ecology" and "steady state economics" as potentially hopeful translations of environmental science into the political realm of policymaking.

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Introduction

This paper seeks to explicate and make clear the precise relationship between capitalism and the natural world. It identifies capitalism as the general market-type of the global economy and deals with it on a global scale. Arguably since at least the 1980s capitalism has taken the form of a largely unregulated, rampantly growing and accumulating global marketplace. This is generally referred to as "neoliberal economics," but whatever the trend is called, its various internal logics have become saliently problematic in the status quo: growth, accumulation, profit, competition, "market fundamentalism," etc. to the point where governments are largely in service of the economy, not regulating it.

These market-based ideologies mediate the human relationship with the natural world and the way we do business, as it were, has a profound effect on the ecosystem we inhabit (Earth). The currently ongoing ecological crisis is not a coincidental consortium of impacts, but a structurally connected array of impacts which are being conditioned by the aggregate of human behavior in the global marketplace. On the small scale, individuals are alienated from their labor and insulated from the impacts of their spending and living practices. On the large scale, entire corporations engage in "greenwashing" and market-based "solutions" to environmental impacts like climate change which ultimately worsen the problem.

So, in looking at the ecological crisis, and the internal logic of capitalism, this paper determines that the capitalistic framework is inherently anti-ecological. Capitalistic and profit-based motives only incentivize "green" action at the expense of worsening (or creating) some other negative environmental impact. Capitalism can help us to mitigate environmental impacts here and there, but its internal logic is such that it *cannot* address the entire ecological crisis

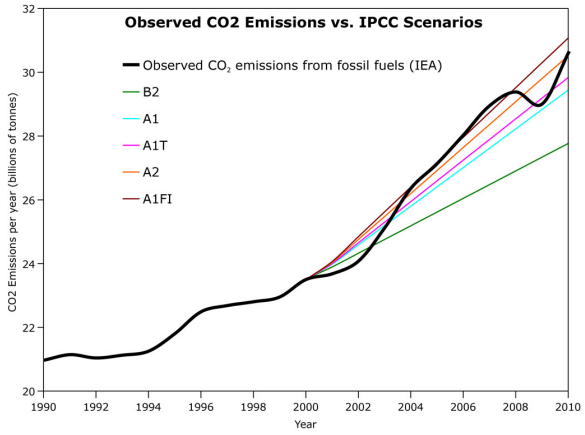
holistically. Addressing an ecological crisis will require integrated ecological solutions, and the tenants of capitalism are anti-ecological and disintegrative.

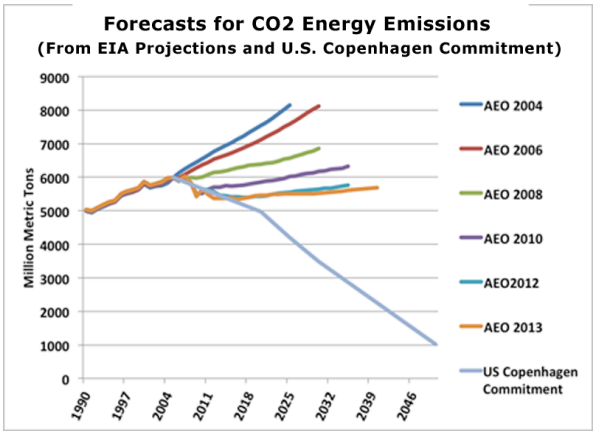
This paper highlights the internal logical contradictions of the system, as well as a few of the tangible effects of such a system, and concludes that if we are to have a chance at surviving the ecological crisis, reforming our global market-type must be the first place to begin.

Preliminary Data and Projections

A quick perusal of the relevant data is necessary to frame the discussion, but the purpose of this paper is not to parrot well-established scientific claims, nor convince the reader of what is increasingly considered a firm and educated consensus. Generally the 3 data points I reference can be summarized as: (1) emissions are rising, (2) we're running out of time, and (3) alternatives or "solutions" *are* feasible.

Firstly, global atmospheric emissions (like carbon dioxide) are rising, despite promises by many nations to lower them. The following charts from the International Energy Agency (IEA) suffice to illustrate this point:[1]



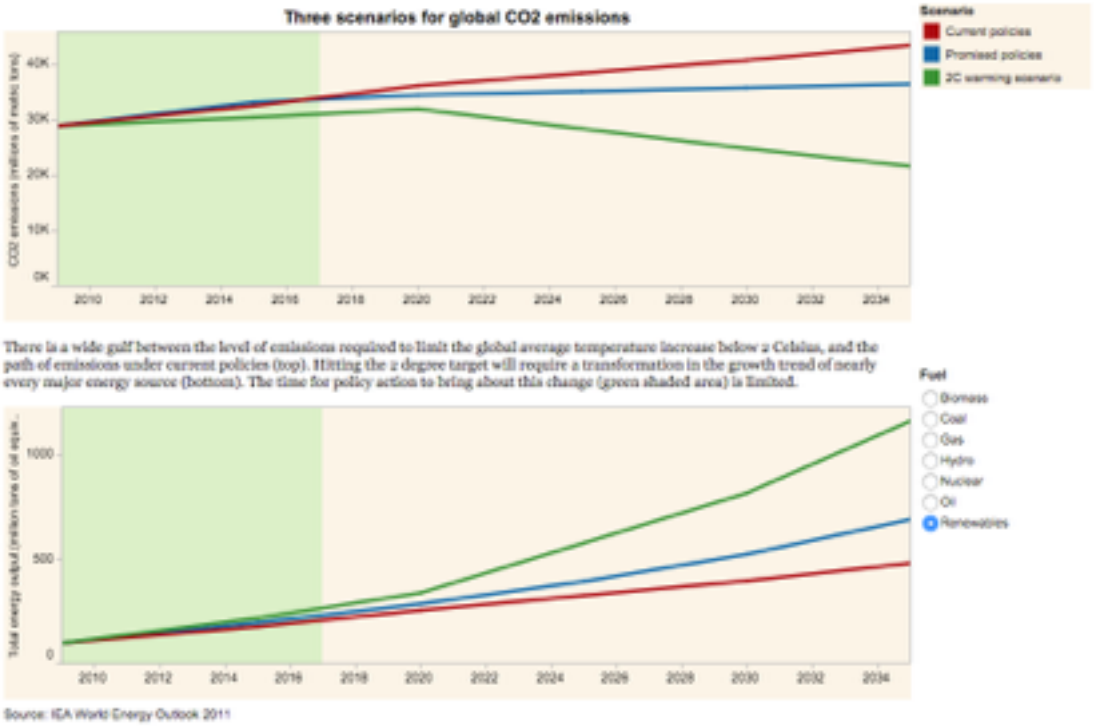


These charts from the IEA make a clear statement: observed fossil fuel emissions continue to rise and the forecasts for the future, while they are increasingly revised downward,

still show net positive growth in fossil fuel emissions. The dismal blue line represents where our promises have been targeted. Clearly we were crossing our fingers.

Secondly, the director of the IEA, Fatih Birol, issued a harrowing warning in 2011 while bringing these numbers to the public eye.[2] He stated at the Global Climate Change Forum that "the door to reach two degrees is about to close. In 2017 it will be closed forever."[3]

Unfortunately, the response of the global community has not been nearly adequate enough to stay below what scientists and the Intergovernmental Panel on Climate Change (IPCC) have determined is the 2 degree threshold for warming on planet earth.[4] The data from the IPCC[5] is even more daunting than that from the IEA:



This confirms the IEA's claims about increasing emissions, but marks that against the required course to stay within the 2 degree warming scenario (the green line). Furthermore, renewable energy sources are severely underdeveloped for the 2 degree scenario.

This data is troubling, but the most troubling part is that since the global community began to try regulating emissions, they've only increased. So either our promises are empty, our efforts are misguided, or our foresight is severely lacking. In any case, the prospects for real change seem bleak. For example, since the Kyoto Protocol (signed in 1997 and made effective in 2005) and its carbon-trading scheme went into effect, we've seen emissions rise to the tune of six times their original level.[6]

This deep irony (that since we have begun trying to regulate atmospheric emissions like carbon dioxide, the more they have increased) is primarily due to the nature of our "regulation." This point will be explored further later, but it boils down to the fact that our climate change policies, initiatives, and trading schemes are not actually "green," they are merely "less-brown" (which still yields a net result of more brown, obviously).[7] Only compared to how bad we've already been are we comparatively "doing better." But really, we are "shoveling fuel on a runaway train."[8] Even if we slow down the rate at which we're shoveling, the train is still running away and our attention ought to be with applying the brakes, not finding new sources of fuel.

The third and last data point I want to mention is the research Mark Jacobson and his team at Stanford University have developed. The full plan is quite massive, as it is so comprehensive and treats such a large scale, and so cannot be covered in full here. But the essential point is that the transition to clean renewable energy is feasible (and without any need for "transition" energy resources like nuclear power or natural gas). Jacobson and his team think that it is nothing more than a myth that renewable energy sources cannot supply adequate energy to the globe, so they set out to dispel that myth.

They drafted up two plans (one for the 50 United States; one for 139 countries) which detail, with local specifics, the exact ways in which each state (or nation) can transition its entire energy supply to renewables.[9] The biggest thing standing in the way of this otherwise feasible goal: the operation of the global economy.

This data indicates that, despite popular opinion, feasibility proves to be one of the smaller challenges we now collectively face. Much larger looms the challenge of getting around the global economy and its vested interests against these alternatives. That is because there is an "iron triangle" of vested interests between corporations, politicians, and neoliberal economists.[10] The transition to renewables is operationally feasible, but the public support is lacking. Worse still, the corporate opposition is both incredibly wealthy and practiced at digging its heels into the sand.

But resistance or not, there is a crisis of drastic proportions and we are all currently living through it. The impacts are often hard to detect, sometimes even invisible, but they are becoming increasingly apparent. The catch: the more visible the impacts become, the more unlikely we are to be able to stop them.

The Ecological Crisis

In the status quo we are experiencing a large-scale widespread ecosystemic breakdown, which is manifesting itself in what illusorily appear to us as discrete and separate threats. My generation alone has been witness to an unprecedented increase in carbon emissions, average global temperatures, ice-cap breakdown and melting, species-extinction, toxic spills (e.g., Fukushima whose impacts were felt in our very own San Diego), crop-variety loss, toxic waste production, GM patent-domination, etc.— the list goes on. The largest of these impacts (at least

in terms of capturing the public imagination and *some* media attention) is climate change. The more carbon dioxide and other pollutants we leak into the atmosphere, the warmer the planet continues to get which, in turn, accelerates ice-cap melting (exponentially increasingly the impact) and goes on and on to other impacts.

The important point is not that the Earth is hotter than it has ever been, but that humans have taken on an increasingly participatory, even dialectical, role in the back-and-forth between human behavior and the state of the natural world. The "natural resources" which are the building blocks of human civilization are being depleted *and* the way they are being depleted is shown to have disastrous health consequences (both for humans and non-humans alike). Humans have become the primary drivers as well as the primary victims in this process.

In other words, the individual breakdowns in the status quo cannot be viewed as isolated instances each with their own distinct set of causes and solutions. To do so would be to ignore the larger glaring pattern. In sum, the pattern is that the plethora of seemingly disparate environmental impacts we are witnessing are all largely linked to ecosystemic breakdown which is primarily driven by our global system of capitalism. The form of global capitalism as it pervades society, politics, international trade, and so on is such that it produces the conditions which precipitate environmental disasters (or "eco-catastrophes").

As Joel Kovel states, "the current stage of history can be characterized as structured by forces that systematically degrade and finally exceed the buffering capacity of nature with respect to human production thereby setting into motion an unpredictable yet interacting and expanding set of ecosystemic breakdowns. The ecological crisis is what is meant by this phrase"[11] And like any living organism, humans exist in the constitutive relationships of an

ecosystem. No matter how insulated from the natural world we have become, we can never escape the fact that we're part of the ecosystem too.

To be clear, there are many negative environmental impacts occurring simultaneously in the status quo. To view these impacts as discrete entities pertains to the "environmental" framework, whereas the "ecological" framework sees humans as deeply enmeshed in those impacts. From an ecological perspective, these impacts are not merely hiccups on the road to the systematic and continued human disregard of nature, but strong warning signs that if we fail to find recourse from our current trajectory, then soon enough it won't matter what we think because it will be too late. We need to "solve" the ecological crisis by ceasing to produce it.

Ecosystem Versus Environment

In order to make this important distinction sufficiently clear, I've included what is essentially a side-by-side contrast of the terms. The point of this endeavor is to solidify the claim that the ecological view is the only framework that stands a chance at providing a structural solution to the ecological crisis.[12]

Ecological	VS.	Environmental
Integrated: parts to Whole	Organization	Disintegrated: isolated entities
Differentiation: individuality and connection (e.g., garden)	Conceptualization	Separation: individuality without connection
Dialectical: inextricably linked with all of nature	Human nature	Privileged: distinct from other-nature
Holistic: detects logical impossibility in treating with current methods/solutions	View of 'crisis'	Splintered: a disparate array of impacts and solutions susceptible to current methods/solutions

An ecological perspective has the unique advantage of addressing the crisis in an integrated, involved, and participatory fashion. This approach recognizes that our actions and

practices and global way of life are not separable from our relationship to the natural world and therefore must incorporate concern for the natural world into our human way of life as well. In this sense, it is truly integrative. In contrast, the environmental perspective is rather *dis*integrative. It sees no relationships between entities and deals with them rather in isolation.

If the difference in organization (integration vs. disintegration) comes down to the relationships between parts and whole, then the difference in organization between the two frameworks stems from their respective conceptualizations *of* the parts and whole. The environmental framework supports disintegration because it views entities (individuals, corporations, nations, etc.) as thoroughly separate. "Separation" here means individuality without connection. The ecological framework is not fooled by the illusive individuality of entities and still sees connections where they might not be obvious. "Differentiation" characterizes the ecological framework because, although seemingly individual, the connections between entities are never ignorable.

The contrast should be becoming clear. The ecological view sees humans as integral in the larger, global ecosystem. It recognizes that humans have a dialectical relationship with the global ecosystem wherein human activities (e.g., production, extraction, development, trade, etc.) have real impacts on the natural world and vice versa. The dialectical relationship is such that the natural world also imposes limits on the extent of human activities. In contrast, the environmental framework sees humans as occupying a privileged role distinct from non-human nature. It views the crisis as something which we must incidentally solve, or fix, in order to continue on our course of *human* nature (despite its incompatibility with the larger whole of nature).

As such, the overall view of the crisis on each account is radically different. With the ecological framework, one sees a global problem and takes a holistic approach to solving it. The implication is that solving the crisis under this framework might entail changing the way that we as humans live, produce, trade, and consume. The ecological framework has the unique advantage of bringing much more into question than the environmental framework which is severely limited in contrast. With the environmental perspective, one sees a splintered array of environmental impacts but does not see their interconnectedness. As such, the "solutions" belonging to the environmental framework will be severely limited in scope. Even when they happen to produce some good or net benefit in one sector, this is by coincidence and not because of proper framing of the crisis. The environmental framework is largely ignorant of how to proceed in face of the crisis.

If privileged human exceptionalism from the whole of nature ("anthropocentrism") is something that sounds familiar to you, it's likely because the environmental framework is the more popular of the two. Business-as-usual is conducive to the environmental perspective. Capitalism fuels and is fed by the environmental framework. The ecological perspective only exists in those enlightened researchers, political theorists, philosophers, and the like who can see the integral connections between parts and whole. Society as a whole, however, is predominantly blind to these connections.

Capitalism as Rampant Global Neoliberal Economics

Speaking about capitalism is difficult, because it requires one to define a global system of organization which has developed over hundreds of years and spans across the pre-industrial era all the way into the post-industrial "information economy." The first thing I want to make clear

is that it is not the token of capital itself (e.g., the dollar) which is inherently problematic. Humans are naturally evaluative beings. Part of what makes us uniquely human is the ability to construct and shape the value we see in things (e.g., utility) and representing that value via tokens is not too far of a step away from this natural condition.

That being said, capitalism is much more than mere capital, and much more than mere tokens. "Capitalism is not a living thing, it is a process."[13] It is a global force that we are sucked into and it comes complete with rules to the game (e.g., necessary competition, growth, accumulation). Kovel refers to these rules as the "force field of capitalism" and argues that it "spreads fast, draws the whole world into itself restructuring production, circulation, exchange, and consumption to accommodate its ever growing pressure."[14] The token of capital itself, while not *inherently* problematic, is ultimately inextricable from the larger system it constructs and propagates.

Another way of thinking about this, and perhaps a clearer way, is under the more common term "neoliberal economics" (otherwise known as Reaganomics or supply side economics in the US). Czech notes that this period of US economic policy was characterized by President Reagan's attempt to revitalize consumer confidence by stimulating rampant production.[15] In other words, I am speaking about the state of capitalism since roughly the 1980s period of neoliberalism when, in a classic case of putting the cart before the horse, production shifted to being in service of utility to being for the sake of production itself. This marks a fundamental departure from the token use of capital to the regime of capital. As Kovel states, "broadly speaking, capital represents the regime in which exchange-value predominates over use-value in the production of commodities."[16]

This description could not be more accurate. The economic climate of the 1980s and onward "emphasizes the importance of facilitating production for the sake of economic growth" and cemented "an ideology that praised the marked while deprecating big government" into the global consciousness.[17]

The neoliberal attitude is highly reflective of the environmental framework discussed earlier. It highlights the role of the individual and merit, and downplays the role of constitutive relationships. This theoretical attitude toward economics both strengthens the environmental perspective as well as it informs it. The global economy fails to find any integration without competition, and it is found extremely lacking in terms of regulation.

Many authors make this connection and explain it in more detail. Parr has this to say: "Neoliberalism is a theoretical position that valorizes individual freedom and liberty, which in practice is propped up by a system of deregulation, free markets, and private-property ownership. … the role of the state has changed from facilitating social well-being to becoming largely concerned with upholding the interests of the free market and safeguarding property rights."[18]

So then, neoliberalism boils down to the valuing of individualism, property rights, free markets, deregulation, and a state concerned with protecting the economy. These values are supported by "such policies as tax cuts, free trade deals, for the auctioning off of core state assets from phones to energy, to water."[19]

The result of neoliberal economics has been market fundamentalism—the idea that the free market can solve all problems, that growth is a rising tide that lifts all boats, and that governments ought to only protect and serve the market economy (i.e., no regulation, more tax cuts, free trade agreements, etc.).

Honing in on the Tensions

With capitalism properly framed, next the following question must be addressed: what does it mean to critique capitalism ecologically? It means more than simply showing how capitalism has been unfavorable for our ecosystem (which it has been). It requires going a step further and, keeping in mind that ecosystems are defined (in opposition to environments) as highlighting the integral relationships between parts and whole, illustrating capitalism's fundamentally disintegrative nature.

An ecological critique will show how capitalism prevents new integrative relationships and breaks down already-existing integration, as well as demonstrate that it creates the conditions for ecosystemic destruction (and when it works to perfection, the ecosystemic destruction is also "perfected"). The point here is that this is not an accidental or coincidental relationship, but a deeply structural one.

A capitalistic perspective (and therefore environmental—lacking *ecological* perspective) cannot even properly frame the crisis, let alone solve it. Nevertheless, its misguided attempts to do so are not without consequence, but the results of these misguided "solutions" are doing more harm than good. The argument is that ecological integrity is the only way to solve the ecological crisis, and capitalism is one of the primary forces against that.

Data clearly indicates the effect of human production and lifestyle on the environment. Countless international summits and councils have been called, firm scientific consensuses have been reached, and there is undoubtedly a relationship to be explored there. As the empirical record shows, the relationship has been historically very harmful. Increased production,

population growth, and development have taken a toll on natural resources which is only mitigated by technological innovation in terms of productive efficiency.

The data-centered and empirical record-centered arguments are those which others have already made incredibly clear. The argument I pursue is more focused on the internal logical contradictions of capitalism in relation to a standard of ecological integrity. As such, I will be dealing with the rather abstract components of capitalism (e.g., alienation) as opposed a more concrete and empirical analysis. Still, though, there will be many empirical impacts along the way.

I have identified several abstract/theoretical tenants of capitalism that illustrate its internal logical contradictions and then I have connected those with easily detectable real-world impacts that illustrate these inconsistencies in practice. I will now explore capitalism as splitting, commodifying, alienating, and ultimately as disintegrating.

The Critique: Splitting, Commodifying, Alienating, Disintegrating

Splitting

The logic of capitalism is such that there are sectors of industry (the extractive, agricultural, information, technology, etc.) and a supply chain (raw materials, manufacturing, distribution, retailer, consumer). When a problem arises (e.g., a manufactured good is not generating the desired revenue for a company), it is localizable to one of these sectors. Either the product isn't being advertised well, the raw materials have risen in price, consumers aren't spending as much, or something else along those lines.

Each industry operates largely independently from one another, and occupies its own sphere. This is not to say that independent industries have no bearing on one another, but for all

intents and purposes, the various industries stand on equal ground. They freely compete. Corporations and the industries they belong to are left to, on the whole, sink or swim on their own according to the logic of the market (bailouts, subsidies, and specialized government industries—like the military—excluded).

Czech notes a problem in this logic when we take a closer look at the origin of money and its distribution across various economic sectors. There is a foundational base of the economy, or productive sector, which is namely the agricultural sector. All production requires energy, and all energy in earth's ecosystem comes from the sun. Solar energy is what is taken up by producers like plants, which is consumed by predators in a food chain. Everything humans produce (be it a salad, a cabin, or even an idea) requires energy. Even production from labor requires caloric intake and thus is sustained first and foremost by an energy supply. Nothing we do is extricable from the supply of earth's energy. The economy and market are no exception. Czech, then, wisely applies the laws of thermodynamics and the concept of trophic levels to the economy—something he calls the "trophic theory of money."[20]

This idea is plain and simple, but its implications are huge. In general, the degree of difference between trophic levels is approximate to a degree of 10. So, for a very rough sketch, in an ecosystem with 1,000 plants (producers), we might expect to see 100 deer (low consumers), and only 10 lions (high consumers). Energy cannot be created or destroyed (first law of thermodynamics—E=mc^2), and because no transfer of energy is 100% efficient (second law of thermodynamics—Entropy Law), it is clear that the "supply" of plants limits the "supply" of deer which in turn limits the "supply" of lions. The numbers are never this clean, but obviously in this ecosystem there could *not* be 1,000 plants, 1,000 deer, and 1,000 lions. Much less

possible would be the presence of 10 plants, 100 deer, and 1,000 lions. So, it is puzzling in modern society when there is such a "mismatch between trophic levels and GDP,"[21] a criticism to be further developed later.

The fault that his trophic theory of money points out is this: the foundation of the global economy (agriculture) represents the producers in the natural order. Above this foundation is heavy manufacturing (infrastructural building, heavy metals, etc.) and above that level is light manufacturing (e.g., computer chips). Ultimately, despite the lessons of thermodynamics and trophic levels, the most profitable industries in terms of GDP are those which are the furthest removed from the foundational level. The impossibility should be obvious—such an arrangement is never nowhere sustainable. It doesn't occur in nature and it cannot occur without disastrous consequences. Even if there is enough built up biomass (fossil fuels) stored away underneath earth's surface now just waiting for the extractive industries to come dig it up, it will eventually deplete.

The math just doesn't add up. Keep in mind the relevant thermodynamic principles. The first law of thermodynamics makes clear that energy cannot be created *ex nihilo*. In earth's closed ecosystem, all energy originates from the sun. So even the fossil fuels which we are so eager to extract will, undeniably, deplete. Fossil fuels take hundreds of millions of years to form (from the decomposition of incredibly old biomass).[22] We deplete this extremely concentrated energy source at a rate that *easily* outstrips the rate at which these fuels can form. "It takes almost 26 tons of raw petroleum to produce 1 liter of gas. It takes almost 800 pounds of coal to power a light bulb 24/7 for an entire year. It would take the natural process of decomposition of

materials 422 years to replace what we currently consume in a year in fossil fuels."[23] Nobody should believe that 1 year of consumption (at the rate of 422 years of production) is sustainable.

In any case, capitalism is not wont to see this inconsistency, and so continues to "split" the ecological crisis. Rather than seeing an ecological crisis with which we are involved in a deep relationship (via our global economic systems, individual practices, etc.), capitalism paints a divisive and illusory picture of individual impacts (each with individual solutions). As Parr states, "the collective crisis is splintered into a disparate and confusing array of individual choices in competition on how to best solve the crisis."[24] The effect is that before we even get started, we've already wrongly conceptualized the crisis (or, conversely, used the environmental framework rather than the ecological framework). The result is an unsuccessful attempt to kill the hydra by infinite decapitations. Rather than changing our global patterns of production, consumption, and accumulation, we seek instead to "solve" oil spills by making BP clean them up, to "solve" waste-production by increasing recycling, to "solve" rising carbon dioxide emissions by purchasing hybrid cars, etc.

Again, it is worth restating that this is not incidental, this is how capitalism works. We are allowed, as it were, to combat climate change, or rising emissions, or whichever environmental impact is on the capitalistic chopping block, just not in a radical or efficacious way. We have options to consume *green*, but not to consume *less*.

Commodifying

Speaking of consumption, capitalism converts the vast majority of earth's ecosystem into commodities. It goes like this: nature has intrinsic value in that ecological integrity (the flourishing of life, the integration of parts to whole, the lack of extinctions) is itself valuable.

From this intrinsic value, humans derive use-value, which is basically just utility (e.g., humans use trees to build shelters). Use-value is not the same as intrinsic value, but it has a basic respect for intrinsic value. The first humans who needed shelter valued the elements of nature that afforded them that shelter. Trade can occur based on use-value, and I could trade you the lumber you need for the flint that I need (a transaction based on utility and quality).

But it is surplus products (say, shelters) and tokens of value (say, dollars), the very building blocks of a "market," that establish the rudimentary rules of capitalism. If there exists some common token of value (again, dollars), then by producing many shelters I may trade (or now, sell) each one I don't have any use for (leaving use-value and quality behind) in the interest of accumulating more tokens of value (dollars) for myself. It really is a quick hop, skip, and a jump from use-value to exchange-value. Once the process of commodification begins, even on a very small scale, the commodity tends to race toward exchange-value over use-value, leaving no consideration for intrinsic value at all.

This commodifying process distorts the real intrinsic value to be respected in nature, and appropriated in an ecologically sound manner by utility. Quality is overshadowed by quantity, utility is overshadowed by the drive for continued accumulation, and nature is eclipsed by "natural resources." Then production is carried out for the sake of production itself, without regard for utility or sustainability.

Take for example a house built of wood. The wood beams cost more than the tree they were cut from, and the house built of the wood beams costs more than both the wood and the tree. Value is "added," theoretically, by the labor that went into converting the tree into wood and the wood into a house. But remember the trophic theory of money: a given trophic level

cannot have more biomass than the one beneath it (e.g., plants, deer, and lions). When the natural capital (trees) have less value than the wood they are cut for, which in turn has less value than the house built of wood, then the highest trophic level (houses) has more value than the trophic levels below it (trees) which support its foundation. This is a recipe for the liquidation of natural capital. This "mismatch between trophic levels and GDP figures"[25] represents the domination of exchange-value over use-value and the complete abandonment of considerations for intrinsic value.

But the natural world isn't the only thing that is commodified by capitalism. It is far from it. Under capitalism, humans become the ultimate commodity. Humans are the cornerstone of the entire value-generating regime. Again, humans are naturally evaluative beings and, rather naturally, assign value to certain things which provide certain utilities, but when value is generated *ex nihilo*, that is cause for concern. In the house-building example, it is the labor of the human that "adds value" to the wood, and to the house, which make both more valuable than the wood they are constructed from.

In a truly trophic sense, this is to be expected because turning a tree into lumber requires a lot of energy; much more still is required for turning lumber into a house. All energy comes from the sun so the amount of energy in the ecosystem is limited. But, the rate at which exchange-value increases is not proportional to the increased energy output in the production process, but rather it is largely contrived from nothing, for no other purpose than to maximize the producer's accumulation.

This point is obvious. Humans keep the whole commodification process going by first selling their labor (energy) for wages (tokens of value) on a market. Certain jobs pay more or

less depending on arbitrary conditions. Some of the most necessary jobs in society pay nearly nothing (think garbage truck drivers, mail deliverers, construction workers, etc.) whereas others are heinously valued in the opposite direction (think CEOs who make 600x what the entry-level employee makes). This isn't simply the way things are. This is the result of capitalism. The effect of this fact is also very obvious: when the natural world isn't properly valued, we tarnish it.

Alienating

Through the process of commodification, an alienating effect also occurs. The more distanced from true relationships we become, the easier it is for the artificial ones to set in. In modern society, "money makes the world go 'round" and we relate to one another as economic agents. If you live in modern society, you interact with others via the market. Everything is commodified (including both the natural world, and yourself via your wage labor).

Keeping in mind an important feature of the ecological framework mentioned earlier, appropriate and integrative relationships between parts and whole are crucial to the proper framing of the ecological crisis. The more alienated we become from these true relations, the harder it becomes to fully cognize the crisis at hand (e.g., when we hear of a BP oil spill, we might think first about the impact on gas prices and second about the impact on the natural world). When nature is commodified, we relate not to it, but to a skewed conception of nature. This "skewing" is of course dubbed alienation. When we value nature environmentally, we conceive of nature as "natural resources" whose only purpose is to conform to human whims. When we value nature ecologically, however, we conceive of nature as that which sustains all of life on earth and as the foundation of every facet of human development, progress, and economy.

As we become further alienated from nature it becomes reflexive to ignore our dialectical and integrated relationship with it.

It's a fancy way of saying that we have left use-value far behind and are no longer connected to our work, our products, or our ecosystem. Alienation is what makes most people feel like they're "working for the weekend" – the idea that labor is inherently unpleasant and cumbersome. When the only way for us to exist in modern society is by selling our labor on a market, to consume products from the market, to put back more money into the market, then we are just cogs in a system which we are very unlikely to reject. We're so far removed from our true nature as integral parts of the whole (the natural world) and real relationships (dialectical, authentic, human relationships) that we reflexively obey the laws of the market. We become *Homo Economicus* and relate to fellow humans not as inherently valuable agents but as economic agents. As Parr puts it, capitalism is "a mechanism of repression, a repressive system, and a displacement activity which we reflexively obey"[26] all at once!

We become insulated from real relationships by artificial market relationships which, while effective, are deeply unnatural. Through capitalism, we become alienated from (1) ourselves, (2) others, and (3) the natural world.

We conceive of ourselves as a repository for "human capital" so that we may get better jobs with higher pay and accumulate more of the goods and wealth we have been conditioned to seek. We think of others as customers or merchants, baristas or financiers. We adopt the roles we are given in the global marketplace.

And we conceive of the natural world as either merely a backdrop against human activity or, worse, as a means to the end of financial success (e.g., oil tycoons, fracking corporations,

deforestation industry, etc.). Such a conception is clearly indicative of the environmental (not the ecological) framework. In any case, it is certainly not conceived as something with which we are deeply connected. It is *because* we are so insulated and alienated from true relationships with the natural world that the industries of the most-intense production occupy a much higher trophic level/GDP figure than the natural capital on which those industries are based.

Disintegrating

The culmination of the splitting, commodifying, and alienating effects of capitalism establishes capitalism as a disintegrating force, fundamentally opposed to the integrative ecological framework.

Capitalism creates the illusion of discrete, isolated entities and prefers to deal in these even when inappropriate. Whether dealing with distinct sectors of industry, parts of the supply chain, or simply individual agents, the logic of capitalism is disintegrative. In other words, the successful capitalist stands alone on their own merit. Relationships and circumstances are downplayed, merit is highlighted, and the individual and their accomplishments are valorized. The wealthy capitalist who appears to have "earned" all their wealth fairly (although this appearance is rarely ever accurate) is celebrated as a more successful capitalist than the capitalist who inherited their fortune. The fact of the matter is however that we all exist in the constitutive relationships of the ecosystem, and in relationship with each other.

No capitalist has ever achieved what they have truly and wholly of their own accord, despite their likely insistence of that point. Zuckerberg couldn't have created Facebook without the prior contributions of Jobs and Gates, Leonardo Da Vinci couldn't have created the Mona Lisa without the subject Lisa Gherardini, and the ideas of Socrates wouldn't have been

propagated without Plato's writings. Social reality truly is a nexus of interrelationships and capitalism is fundamentally opposed to conceiving of it as such.

There is no denying that we are individual entities, but disintegration deals with *isolated* individual entities whereas integration deals with deeply *connected* individual entities. Individuality is not denied on the ecological framework, but it does not pretend that our connections are irrelevant.

The difference between integration and disintegration is not trivial. As Kovel states, "humans can be a part of nature that catalyses nature's own exuberance so that the combined human-natural ecosystem is integral and differentiated rather than disintegrated and split."[27] To use a simple analogy, we can think of an economy like a garden. It is comprised by various individual crops (industries/corporations) which can all strive and grow and be healthy in their own individual right. But if one crop (or industry) grows so much that there's no more nutritious soil (or natural capital) for the others, the whole garden can fall into disarray. On the contrary, if the flourishing of the individual crops is integrated and proportional, then a "flourishing garden" emerges from the aggregate of flourishing individual crops.

The preferred garden is not the one with the most vertical growth, or the most competition for resources, or the largest plot upon which it is situated, but rather the one with the most overall health as represented by ecological integrity. That's essentially how our modern society must be structured: without an overarching system of regulation, each industry is left to its own motivations and devices (profit, accumulation, etc.) to destabilize the entire global ecosystem at the expense of everybody.

Without integration, we clash with natural systems. Think of the popular acronym "NIMBY" (Not In My Back Yard) which is an apt description of the common response to modern development. We produce waste which fills up landfills, we extract fossil fuels which pollute our atmosphere, we create toxins that poison organic life and so on. It seems to be the case that development and production under business-as-usual in the status quo coproduce all kinds of harms for society and the farthest we can get away from them is by pushing them off on someone else and saying Not In My Back Yard!

In contrast, and with integration, we can enhance and catalyze natural systems like Kovel recommends (e.g., using tidal waves to capture energy, or solar panels to harness solar energy, etc.). Klein also has high hopes for this prospect and characterizes it with a new acronym to reflect the health that arises from integration: "POOL" (Please, On Our Land!).[28] Our production and our development, even our business, could potentially catalyze natural systems and not leave behind a trail of waste and byproducts that will take hundreds of years to dissipate into a wrecked ecosystem. However, the strongest enemy of an integrated world is a disintegrated (and *disintegrative*) market.

The Effects: Economism, Biopolitics and Climate Capitalism

The three main effects of capitalism I will briefly discuss are (1) economism, (2) biopolitics, and (3) climate capitalism. Each of these is closely related to the alienating, commodifying and splitting effects of capitalism and help further establish the case for capitalism's inherent disintegrative nature which is, thus, anti-ecological.

First, "economism" refers to the tendency, in language, thought, and practice, to reduce all relationships to economic ones (e.g., "incorporate this," "capitalize on that," "spend your time wisely"). My personal favorite representation of economism is: "time is money" because it is so radically inappropriate and shows precisely to what extent our economic relations skew our view of everything else (even to the point of reducing time itself to a hollow repository for the accumulation of money).

It should be clear how economism is the psychological extension of a world that is radically commodified and injected with artificial market relationships to replace the appropriate ecological ones. Parr captures the slippery slope from commodification to economism well: "the law of the market produces a fiction (the price of an invisible commodity—carbon). We identify with the plight of life on earth through the free market, which mediates our relationship to each other and to the environment."[29] The fact that we can theoretically commodify just about anything is dangerous because while we do need to solve certain problems, like carbon emissions in the atmosphere, turning carbon and the atmosphere itself (quite intangible things) into commodities themselves is a step in the wrong direction.

Secondly, "biopolitics" is a term used by philosophers to indicate the effect that human social and cultural constructs (including marketplaces and market ideologies) can have on the way we actually structure and live our entire lives. This is essentially economism taken to the next level; the *lived* level. Again, when we're alienated from true relationships, artificial ones fill in as a way of managing human life processes via power, authority, and mechanisms of control. The biopolitical effects of capitalism are far-ranging and they essentially take the form of sacrificing health, security, or happiness for wealth or profit.

For example, in the previous section I mentioned how self-alienation lends itself to a self-concept of being merely a repository for human capital. Taken to the biopolitical level, this notion might compel me to cultivate only profitable skills and interests, to take a job that I'm not passionate about (or even morally opposed to), and ignore my personal flourishing unless it is worthwhile in a capitalistic sense (meaning profitable).

This is seen all the time, all over the world. From agricultural workers being exposed to harmful pesticides all the way to workers developing black lung in coal mines, we have a strong history of sacrificing almost everything truly valuable (life, health, and happiness) for that which has only abstract imaginary value (pieces of paper with presidents printed on them). When our lives are ordered in every aspect by capital, it becomes difficult to question (much less reject) the system. And when we're blinded like this, it's easy to overlook major flaws like climate capitalism, to be addressed next.

Keeping in mind how "neoliberal capitalism takes the collective issues and splinters them into confusion,"[30] well then "the collective crisis is restructured and privatized, then put to work for the production and circulation of capital as the average of wealth inequality grows at the expense of those in abject poverty."[31] "Climate capitalism" broadly refers to market-based "solutions" to climate change.

It represents how, given the ubiquity of market-based social reality, the only way we know how to think and confront something even as large as climate change, is through market-based solutions and capitalism itself. It is as though we carry only one tool in our toolbox. Keeping in mind that capitalism is more of a process and a force field than a particular thing, it has a fluid and malleable nature that allows it to adapt to challenges to its continuation. This

means that whenever there is some sign to slow down (be it scientific, ecological, or even an economic reason to consume and grow less), capitalism, as a force, always finds a way to sneak around it and, in so doing, transcend it. So when there is a block in the flow of capital, it is absorbed into the capitalistic system itself. This appropriation opens up even more new avenues for capital accumulation. It gets *ideally* beyond the barrier or blockage, but it is not *really* overcoming it.[32] The "solution" to problem X in turn exacerbates problem Y, or creates an entirely new problem Z.

So when confronted with some environmental impact as big as climate change, which is a structural challenge to the system of extraction, accumulation, and profit, capitalism (as the only tool in our toolbox) does the only thing it knows how to: try to profit from the challenge. The public are shoppers who are told not to consume less, but to consume (more) green.[33] To help combat the ecological crisis, we are told to purchase reusable grocery bags, drive hybrids and try to carpool, and recycle our waste. But none of these "solutions" has any bearing whatsoever on the larger patterns of production and consumption that precondition the ecological crisis. At best, the *absolute most* these market-based solutions can do is mitigate harms. Buying a hybrid car is helpful but still contributes to the culture of individual transportation and the expansion of highways (4 lanes, 8 lanes, 12 lanes, 24?), and drive-throughs.

We should obviously recycle at every opportunity to do so, but that only reduces the amount of waste we produce. No amount of recycling can combat the structure of global production. But the disintegrated world of capitalism convinces us that we can have our cake and it too—we can continue to produce, consume, and accumulate in a "green" manner. The fact of the matter is: that's bologna. There is no such thing as green growth, only "less brown"

growth.[34] There's all kinds of initiatives we can buy into to combat environmental impacts, but we *must* consume. When we consume green, we're not consuming less. Nor are we establishing ecological integrity because we've already abandoned an integrated framework.

Without mechanisms of regulation and redistribution, we are left with a market that determines the structure of our reality. Looking at carbon trading (e.g., Kyoto Protocol), the issue is that excess profits from selling carbon credits can go right back into dirty industries. Kovel makes clear that the Kyoto Protocol really just keeps "capitalism in control of a process that would otherwise by its inherent logic bring it down; and in so doing, make money out of reducing emissions,"[35] which is a perfect example of climate capitalism in action. Perhaps with some regulation we could funnel the profits of dirty industries and tricky schemes into renewable energy sectors and the like, but the current state of mainstream economics has no such mechanisms or motives.

In one sense, this "keeps us in the displacement activity of barking up the wrong tree."[36] But I've already discussed a few of the negative effects of this capitalistic displacement that are much more harmful than merely barking up the wrong tree, including the fact that since the Kyoto Protocol went into effect, we've seen emissions levels increase *sixfold*. Something simply isn't adding up. The one tool in our toolbox is not getting the job done and also happens to be worsening the problem at hand.

The Problems Become Salient: Growth, Consumption, Accumulation

The abstract theoretical critique highlights some tangible negative impacts of capitalism. These negative impacts—economism, biopolitics, and climate capitalism—in turn highlight the practical and political issues of capitalism. When we take a look at climate capitalism, for

example, the crucial problem is that the profits of dirty industries generally further dirty industries (and there's no reason the profits of clean industries can't do the same).

It becomes clear that it is really capitalism's "force field" that is the most problematic: the imperatives of growth, consumption, accumulation, and the associated production of waste. We cannot solve overconsumption by different methods of consuming. There is no green growth, but only less-brown growth which is "not always and everywhere bad, but it's never, nowhere green."[37] And furthermore, "with the size of the economy becoming more and more problematic, it should be clear that ever increasing expenditures in the aggregate are not the solution."[38]

Growth is one of the central pillars of capitalism. The logic of capitalism is such that in order for per capita consumption and standard of living to increase (with an increasing population) then economic growth is necessary. But there are limits to growth and "green-growth" denies these limits using win-win rhetoric wherein we can affirm our over-consumptive lifestyles as well as champion a concern for the natural world. A most insidious form of cognitive dissonance, this position ignores several fundamental considerations relevant to energy, production, and long-term sustainability.

Growth gives us some good when there is room to grow. Early prehistoric humans didn't need to worry about monitoring their ecological footprint. The laws of thermodynamics still applied then, but their effects were certainly less pronounced. But now, under a full-world economy, without room to grow, there are different rules. "Energy income from the sun establishes an absolute upper limit to sustainable economic production, an upper limit to gross world product."[39] With 7.4 billion humans living on earth at the time of writing, we are clearly

pushing up against ecosystemic limits. The amount of energy entering earth's ecosystem from the sun can sustain 7 billion humans, but not 7 billion humans living an American lifestyle. If we have already reached limits as to what types of lifestyles we can lead, absolute limits are not far off. A full-world economy unequivocally establishes the relevance of ecological principles in the field of economics.

There is a point where economic growth becomes uneconomic—where costs no longer yield the benefits. In a full-world, "economic growth costs more than its worth, causes more problems than it solves, threatens more than it protects. It's a bad deal."[40] The standard rules of capitalism no longer apply (grow, accumulate, profit, etc.). We simply can't afford to live that way anymore. If everyone lived with a consumptive lifestyle on par with the average American, we would need 5.5 earths to sustain the global population.[41] Therefore it is clear that our patterns of consumption must be the first on the chopping block.

Bottom Line

Insofar as capitalism demands growth, capitalism is unsustainable. When living in a full-world, the only viable alternative to growth is a steady state (or a recession—much less viable). Degrowth might be necessary in the short-term, but limits to growth must be well-integrated into the whole of our society—our politics, our individual consumption, and most importantly our global economy.

"The bottom line is that markets are all about the consumption of resources. No matter how efficiently they allocate resources today, *bigger* markets means *more* consumption and *less* resources tomorrow."[42] That's clear enough! The ecological critique of capitalism says that our global market remains structurally, not incidentally, ignorant of important scientific principles

that imply limits to growth. There are limits to what we can produce and consume, and an upper limit to the total amount of biomass that earth can support. Earth is a closed system, a planetary ecosystem, which derives its energy from the sun and our human constructs about value, markets, and commodities have skewed the natural order of things. We are currently paying the price for this ignorance.

As Czech so aptly states, "nature bats last" and when a full-world is pushing up against clear limits to growth, and continues to push further out of an inability to abandon the capitalistic worldview, then the full-world will be "penalized accordingly."[43] We must learn to be dialectical. The ecological crisis is destructive and terrifying but it also is majorly instructive. We can no longer pretend the world consists of isolated individual entities devoid of integral connections, nor can we allow our markets to regulate our lives any longer. In one sense, the ecological crisis is a sort of great equalizer—it forces us to finally see the world as a cohesive whole (as opposed to a hodgepodge of distinct entities, nations, and geographies)—and therefore to finally integrate our human existence with the rest of the natural world.

Our global systems of organization can no longer be antithetical to the type of social and ecological wellbeing that we desire. The time has come to think critically about what we want our global society to look like, and shape it toward that vision. We can no longer let markets organize the natural world. Even capitalists like Thomas Piketty are finally suggesting regulation of capital. Piketty writes that unregulated capitalism generates highly unsustainable and anti-democratic tendencies in the long-run.[44]

Classical authors like John Stuart Mill wrote on the stationary state and pondered the end of economic growth.[45] He understood that growth is not indefinite, and so asked questions such

as what are we “progressing” towards? What are we “developing” towards? These questions are helpful because our current trajectory is aligned with heralding in greater inequality and more ecosystemic destruction, lowered standard of living, and possibly even mass extinctions.

Modern authors like Brian Czech have picked up this idea and continued to develop the idea of a stationary state and how we might begin to prefigure it in modern society. If we want social well-being and ecosystemic health and integrity, our markets and our society must be integrated with those goals.

In sum, this project has illustrated how capitalism is internally incompatible with a framework of ecological integrity, and how a framework of ecological integrity is key to “solving” the ecological crisis (a better term here might be “stop causing”). And lastly it explicates the way in which rampant neoliberal mainstream economics ease us into a state of alienation where real, effective reform escapes us (instead taking the shape of climate capitalism and less-brown growth). So, if we are to have a chance at recourse, radically reforming our global marketplace is the first place to start. Considering the data from the beginning of this project, the prospects are bleak. Such a task will not be easy nor hasty, but it is certainly feasible. By critiquing capitalism ecologically, it becomes undeniably evident that the problems generated by capitalism will not be solved within the same framework that created them. Now is the time for true human regulation of our markets, rather than the continued market regulation of human life.

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[2] http://www.theguardian.com/environment/2011/nov/09/fossil-fuel-infrastructure-climate-change

[3] Klein, p. 23

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[6] Klein, p. 79-80

[7] Czech develops the helpful terminology of "less-brown" as opposed to "green"

[8] Another helpful analogy from Brian Czech, and the title of one of his books

[9] http://thesolutionsproject.org

[10] Czech, p. 248-249

[11] Kovel, p. 23

[12] Author's personal notes and charts

[13] Parr, p. 97

[14] Kovel, p.75

[15] Czech, p. 245

[16] Kovel, p. 39-40

[17] Czech, p. 245

[18] Parr, p. 125

[19] Klein, p. 39

[20] Czech, p. 161

[21] Czech, p. 183

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[24] Parr, p. 5

[25] Czech, p. 183

[26] Parr, p. 35

[27] Kovel, p. 120 (garden analogy also on p. 117)

[28] Klein, p. 132

[29] Parr, p. 35

[30] Parr, p. 5

[31] Parr, p. 6

[32] Parr, p. 97

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[39] Czech, p. 161

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[41] Czech, p. 269

[42] Czech, p. 148

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[44] Piketty, p. 1 and p. 96

[45] Mill, “Principles of Political Economy” (Stationary state)