



# SYSTEM CHANGE NOT CLIMATE CHANGE

A Revolutionary Response  
to Environmental Crisis

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## INTRODUCTION

### Why We Need System Change

Martin Empson

As we approach the third decade of the 21st century, humanity faces an existential threat. Multiple environmental crises — most notably climate change and the destruction of biodiversity — threaten the very basis of our society. The authors in this book argue that the cause of these catastrophic threats is the nature of capitalist society. It is a system which puts the profits of businesses and multinational corporations before the long term interests of people and the planet that they live on.

This book was put together in the early months of 2019. The previous year saw heat waves across the globe. In many parts of the world there were unprecedented temperatures. The immediate effects of these were localised in the sense that different countries experienced and reacted differently; but from the Americas to Asia, from the Arctic Circle to Africa millions of people experienced a hotter world. In 2018 the impact of a warming world could be felt in places as varied as North America, where temperatures broke record after record, and in Sweden, where numerous wild fires took hold even within in the Arctic Circle. In France some cities imposed travel bans to reduce air pollution that was worsened by the hot, still air. In Spain nine people died from the heat and between April and July Germany had average temperatures 3.6 degrees Celsius higher than 1961 to 1990.

But these temperatures paled when compared to those experienced in parts of the Global South. In July 2018 Yerevan, Armenia, experienced a record high for the month of 42°C. In April, in Nawabshah, Pakistan one million people experienced a temperature of 50.2°C, and on 26 June in Quriyat, Oman, temperatures in one 24-hour period never dropped below 42.6°C — the highest minimum temperature ever recorded. The British Trades Union Congress argues that a temperature range of 22°C to 24°C is the “comfort zone” for working, and above this productivity falls. If blood temperature reaches 39 degrees “there is a risk of heat stroke or collapse”. The TUC calls for a legal maximum temperature at work of 30°C (27°C for “strenuous work”).

These headline temperatures are part of a pattern of extremes in a warming world — more and more locations are experiencing hotter and hotter weather. But the crisis is not simply about temperature. As global warming increases

temperatures the weather becomes more extreme, more unpredictable and individual events — whether hurricanes, heat waves, wildfires or droughts — become more intense. Seemingly paradoxically we also see periods of intense cold, such as the polar vortexes that hit the United States, as changing weather patterns drive intensely cold Arctic air southwards. These impacts will also drive further environmental and social crises — rising sea levels will flood coastal lands, ruining freshwater supplies, rendering agricultural land unusable, making some cities uninhabitable and requiring billions to be spent on flood defences. Even in the short term, the human consequences will be unimaginable.

In October 2018 the United Nations Intergovernmental Panel on Climate Change released a report that argued the world had only 12 years to keep the rise in global temperature to a maximum of 1.5 degrees to avoid environmental disaster. Doing this would require, what the IPCC report has called “transformative systemic change”. But despite decades of warnings there has been next to no serious action to avoid climate disaster. One author explained the cause of global warming and what needs to be done:

This change is thought to have come about mainly as the result of burning fossil fuels... The output of these (and other) carbon dioxide sources is clearly outstripping the absorbing capacity of carbon dioxide “sinks”... If the surplus continues to increase at its present rate, CO<sub>2</sub> in the atmosphere promises to reach levels of over 650ppm in the next fifty years...scientists now generally agree that the present build-up of CO<sub>2</sub> in the atmosphere could, if it were to continue without restriction, spell catastrophe for our planet within less than a century. Exactly what to do about it must remain in question until we have more exact knowledge... But time is not on our side... How can a dangerous bottleneck of atmospheric carbon dioxide be avoided? The obvious answer is, by curbing the use of fossil fuels, but it is plainly an answer that today runs straight against the grain of real politics and economic habit.

This passage was written by the conservationist Robert Lamb in 1979. Forty years ago he was entitled not be 100 percent sure about the exact causes of climate change and the required solutions. But in the ensuing decades the contributions of thousands of scientists mean we can confidently agree with his conclusion — the need to end the use of fossil fuels. Those politicians who tell us today that there is not a scientific consensus, or that we have only understood the problem recently are lying — the problem, and its causes have

been understood for decades, and every year of inaction has worsened the crisis and condemned millions of people to suffering.

The victims of the environmental crisis are the poorest and most vulnerable in society. This unequal impact of climate change is, in part, the result of the development of capitalism itself. Countries like Britain and the United States grew rich by robbing the rest of the globe of its natural resources and people. As Karl Marx pointed out in *Capital*:

The discovery of gold and silver in America, the extirpation, enslavement and entombment in mines of the aboriginal population, the beginning of the conquest and looting of the East Indies, the turning of Africa into a warren for the commercial hunting of black-skins, signalled the rosy dawn of the era of capitalist production. These idyllic proceedings are the chief momenta of primitive accumulation.

As capitalism expanded across the globe it concentrated wealth in a few countries, and a system of fossil fuel capitalism developed which rapidly expanded around the world.

But climate change also impacts unequally because of the structure of capitalist society. Even in rich countries the poorest are hit first and worst by climate change. Environmental crisis exacerbates all the fault-lines and fractures within capitalism. Wherever you are in the world, if you are poor, black or female you are more likely to be the victim of climate change. This is even acknowledged by the United Nations:

Disasters tend to hit the poorest and most marginalized demographics the hardest. Women and girls are particularly exposed to climate-related disaster risk — they are likely to suffer higher rates of mortality, morbidity and economic damage to their livelihoods.

In a disaster, the UN concluded, women and children are 14 times more likely to be victims. This is true even in the developed world — in the 2003 European heatwave, more women died than men. Similarly, black and Asian communities are more likely to be sited in areas of vulnerability to environmental disaster. When Hurricane Katrina hit New Orleans in 2005, those who were left behind and trapped in the Superdome were overwhelmingly black. They were demonised as looters, and wrongly accused of rape and violence, as they struggled to survive in the aftermath.

Similarly, when Hurricane Sandy hit New York in 2012, those who suffered most from the blackouts and loss of services were predominantly from the poorest neighbourhoods, which meant that black people were particularly badly hit. Environmental disaster also leads to people fleeing their homes. The term “climate refugee” is often applied to those fleeing from the effects of global warming, environmental disaster or consequent social collapse. It’s a term that has as yet no legal definition, yet millions of people already have the label. As Ashley Dawson has recently argued in his book *Extreme Cities*:

The Internal Displacement Monitoring Centre calculates that 192.3 million people from 113 countries were displaced because of disasters in 2015, “more than twice the number who fled conflict and violence”.

The floods in Pakistan in 2010, to take one example, led to one million people becoming refugees, people who were then prone to malaria and other diseases as they waited for assistance. In the United States around one million people fled Hurricane Katrina and Hurricane Sandy displaced 776,000 people. Despite promises made in the midst of crisis, these people were quickly forgotten. Eleven years after Katrina, in the world’s richest economy, one in three black residents had yet to return home and some areas still have less than half of their pre-disaster population. As one report says New Orleans did not have “an equal opportunity recovery”. In the aftermath of Sandy, veteran Civil Rights campaigner Al Sharpton argued powerfully against media use of the phrase refugee to describe the victims: “They are not refugees wandering somewhere looking for charity. They are victims of neglect and a situation they should never have been put in in the first place”.

This demonisation of the victims of disaster is a small indication of what we will see in the future. We already know from the 2015 refugee crisis that those fleeing war and disaster are prevented from seeking refuge. They are stopped at the borders by barbed wire and armed men, and governments and the media demonise and lie about the refugees to justify the refusal of assistance. As a result, the Mediterranean Sea has become a graveyard for thousands of men, women and children whose only crime was to hope for a better life.

The tragic irony is that the refugees come from countries that have done little or nothing to contribute to global warming. Because carbon dioxide can stay in the atmosphere for hundreds of years, it is the developed world that has contributed most to the current crisis. Britain contributed over 50 percent of

carbon dioxide until the year 1883. As a result, Britain has been responsible for just over 5 percent of all historic emissions of CO<sub>2</sub>. The United States has been responsible for 26 percent of historic emissions, and the 28 countries of the EU are responsible for just under 22 percent. The rapid transformation of the Chinese economy means that it is one of today's biggest emitters, but historically is only responsible for just under 13 percent of emissions.<sup>1</sup>

This means that the developed world has a historic debt to the people of the whole globe. Countries like the US and those of Europe have created environmental disaster. But this is not to blame everyone. Since 1988 just 100 fossil fuel producers have been responsible for 71 percent of global emissions, and 52 percent of historic emissions.

This helps us understand how to stop environmental disaster. Those who argue that we should change our individual lifestyles — giving up cars or flying, changing to a vegan or vegetarian diet — are missing the point. We need to challenge the very existence of those fossil fuel corporations and the system that needs them.

But capitalism is a fossil fuel system and the state will organise to protect the interests of capital. This contradiction means that at the same time as governments around the world promise action on the environment, they also hand out subsidies and support to the fossil fuel industry. Those who protest against pipelines or against fracking meet the full force of the state — through the police and the legal system.

The end of 2018 saw a global resurgence of the environmental movement. Protests by groups like Extinction Rebellion in the UK, or the wave of international student strikes, show that millions of people understand that to get change we need mass action. The popularity of the slogan “System Change Not Climate Change” also suggests that protesters understand we need fundamental change.

Climate change is closely linked to other environmental and social issues — it has a knock on effect in terms of species extinction and food production for instance. But all the environmental threats we face — whether it is plastic pollution in the oceans, air pollution in our cities, or dead zones in the sea due to agricultural chemicals — are caused and made worse by a system that puts profits before anything else. The chapters in this book explore the

environmental crises we face, show how they are linked to the capitalist system and offer a strategy for radical change.

Capitalism is a system that is inherently anti-ecological. It destroys the natural world that we all rely on and are part of. Because of this capitalism cannot solve the environmental crises that it has caused. In fact, capitalism's solutions make the situation worse, and only serve to further increase the profits of the multinationals. What is needed is revolutionary change.

Under capitalism it is the labour of ordinary working people that makes the system work. Karl Marx showed how the bosses make profits out of the exploitative relationship between the boss and the workers. The bosses' system relies completely on the labour of billions of ordinary men and women, and so it is these people who have the power to change society. When they stop work the system grinds to a halt. Without workers, trains don't run, cars aren't built, telephones aren't answered and food doesn't get grown or distributed.

Karl Marx did not know about global climate change. But he did understand that there was a link between capitalism and environmental destruction. He saw that without a revolution replacing capitalism with a system where production was based on a democratically planned economy, humanity was doomed to ongoing environmental crisis. That society — a socialist one where ordinary people organise collectively to rationally use the world's resources in the best interest of people and planet — is the only way we can ensure a sustainable future. This book is a contribution to the struggle for that future.

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## CHAPTER 2

### **Marxism and the Anthropocene**

Camilla Royle

As you read this chapter every breath you take in contains about 410 parts per million (ppm) of carbon dioxide, around a third more than your great grandparents breathed 100 years ago. As well as leading to potentially catastrophic global warming, carbon dioxide in the atmosphere has changed the way plants photosynthesise and has also made seas and lakes more acidic, more so than they have been for the last 800,000 years.<sup>2</sup> The effect human activity is having on the world is on such a huge scale that, for a growing number of



thinkers, earth has entered a new geological epoch defined by human influence. Using the Greek word Anthropos (human) they propose to name this epoch the Anthropocene. The reality of the Anthropocene is becoming quite widely accepted.

Two scientists, Simon Lewis and Mark Maslin state that “it is difficult to find a scientist who disagrees with the central Anthropocene claim: that humans have radically changed the Earth as an integrated system”.

This is not just about carbon dioxide emissions. Plastic, invented not much more than 100 years ago, now forms huge swirling islands in the oceans, and plastic and aluminium waste, which one study refers to as “technofossils”, can be found in sediments. The invention of synthetic fertilisers has meant that more nitrogen is now being added to the environment by humans than by all other processes; this has allowed levels of nitrogen and phosphorous in soils to double in the past century. Radionucleotides produced by nuclear energy and nuclear weapons testing can also be detected in the soil. And species extinction is at least 100 times higher than it would be without human intervention. These changes can be detected across vast areas of the earth, the seas, the atmosphere and in the bodies of living things. And all of them would not have taken place without humans. The Anthropocene means an uncertain future, where human activity is in danger of pushing planetary conditions away from a “safe operating space” for humanity towards a completely different type of world to which human societies may not even have time to adapt.

The term “Anthropocene” has been popularised by two Earth System scientists, Paul Crutzen and Eugene Stoermer.

They used the word in a short article in 2000 for the newsletter of the International Geosphere-Biosphere Programme. Geologists conventionally divide up historical time into eons, eras, periods, epochs and ages. Currently we are in the Phanerozoic eon, the Cenozoic era and the quaternary period. The quaternary is divided further into two epochs: Pleistocene and Holocene. The Pleistocene was marked by huge climatic fluctuations and repeated ice ages in the Northern hemisphere. The Holocene began the last time the glaciers retreated. For Crutzen and Stoermer, humans have recently become a much more significant force than in the Holocene and are likely to “remain a major geological force for many millennia, maybe millions of years, to come”.

“What matters when dividing geological-scale time is global-scale changes to Earth’s status, driven by causes as varied as meteor strikes, the movement of continents and sustained volcanic eruptions”. For some, humanity’s effect on the planet is so profound that it can be likened to such events. For others, humanity is so deeply implicated in planetary processes that we are a constant presence; we are like the weather. As Simon Lewis points out, the diagnosis of the Anthropocene represents a shift in the way humanity sees itself. Scientists in the past have shown humanity how insignificant we are; Copernicus discovered that we are not the centre of the universe and Charles Darwin showed that we are not at the top of an evolutionary hierarchy. But now “the future direction of the only place in the universe where we know life exists is in our hands. Suddenly, after almost 500 years, humanity is centre stage again”.

Since 2000 the usage of the term Anthropocene has spread far beyond the small group of scientists who came up with the idea. Numerous blogs discussing the Anthropocene have been set up, articles written and events held to discuss the issue. The idea has also captured the imagination of artists like Jason deCaires Taylor, whose 2011 piece “Anthropocene” is an underwater sculpture of a Volkswagen Beetle with a girl curled up on the windscreen. The sculpture demonstrates the connection between human-made items and the lives of other species by acting as an artificial reef that is designed to attract lobsters to come and live inside it.

For socialists, the Anthropocene can prompt us to rethink our ideas about the relationship between humans and (the rest of) nature, the role scientists might play in progressive politics and the centrality of environmental ideas to Marxist theory. However, the idea has not been universally accepted by Marxists. Some, such as John Bellamy Foster and Ian Angus, endorse the concept of the Anthropocene wholeheartedly. As Foster points out, in the Soviet Union geologists Aleksei Pavlov and Vladimir Vernadsky both developed an understanding of the role of human agency in environmental transformation similar to theories of the Anthropocene today. The latter, writing in 1945, was already describing humans as a geological force. According to Foster, the contribution to environmental thinking made by scientists in the Soviet Union owed a lot to Karl Marx’s dialectical and materialist understanding.

For others on the left, however, the idea is unhelpful or even damaging for the goal of bringing about a more environmentally just society. Naomi Klein has argued that using the term Anthropocene reduces the problem to one of human

nature and lets capitalism off the hook. For Andreas Malm the popularity of the idea “may be part of the problem” and he has called it “an indefensible abstraction at the point of departure”. This chapter summarises some of the debates among scientists, explains the criticisms from some on the left and concludes by arguing that, nevertheless, the idea remains useful and that Marxists should seek to use our existing tools to understand the phenomenon.

### **When did the Anthropocene begin?**

Crutzen is a Nobel Prize winning atmospheric chemist famous for his work on the depletion of the ozone layer, while Stoermer is a freshwater biologist. But it is normally the task of geologists to decide when one epoch ends and another begins. Boundaries between geological time units represent major changes in the Earth System which have often involved rapid changes in the type of species on the planet as well as signatures in the rock strata. The start of the Cenozoic era 65 million years ago was marked by a dramatic loss of species including extinction for all the non-avian dinosaurs (the K-T extinction). It was the start of the era of birds and mammals. As well as changes in the fossil record, geologists prefer to find a marker of a specific event — known as a “golden spike” — in rock, sediment or glacier ice. So a peak in the levels of the element iridium measured in the rocks at El Kef, Tunisia, is consistent with the idea that a meteor hit Earth at this time and provides an official geological marker for the Cenozoic. The golden spike need not represent the

most important thing that happened at the boundary between time periods, it simply serves as a marker that geologists can agree on. Indeed, recent research suggests that the dinosaurs were already dying out, clearing the way for the evolution of mammals, and that the meteor strike itself was merely the final nail in the coffin.

There has been much debate about when the Anthropocene started. One proposal is that the epoch actually began 11,700 years ago, which by convention we currently think of as the start of the Holocene (so Holocene could be renamed “Anthropocene” or geologists could keep the existing terminology and simply accept that the Holocene has been the real age of humans all along). The Holocene is when the last ice age ended; the relatively warm temperatures in the Northern hemisphere allowed human civilisations to spread throughout the globe and agriculture to develop. Other proposals for an “early Anthropocene” push the start date back even further in time, to when

humans caused the extinction of many large mammals or even to the first surviving evidence of any human activity.

There is some justification for dating the start of the Anthropocene back this far. The Holocene epoch was described in early geology manuals as the “anthropozoic” and the “age of mind and era of man”. An early Anthropocene start date would reflect the fact that the human species has always lived in a complex and developing relationship with our external environment, adapting our local environmental conditions to suit our needs throughout much of human history. We have been

and crop plants for thousands of years. The development of agriculture in the Holocene influenced the way human societies have developed, allowing for the establishment of settlements and class and gender divisions within these societies. Judith Orr provides an overview of how human societies have developed in relationship with the environment with a particular emphasis on gender relations. She points out that, rather than being “a static backdrop to our lives”, the environment “undergoes perpetual change and is also itself in part human-made”.

A contrasting proposal from Mark Maslin and Simon Lewis that teases out the role of colonialism in large-scale biospheric transformations, is that the Anthropocene started with the first contact with the “New World” by Europeans in 1492. Humans introduced New World crops such as maize and potatoes to Europe, Asia and Africa and transported wheat and sugarcane to the Americas causing significant changes to ecosystems that were irreversible, occurred all over the world and can be detected by, for example, the appearance of maize pollen in marine sediments off the coast of Italy. This period of history is referred to as “the Great Transformation” in Chris Harman’s *A People’s History of the World* as it was also the time of the renaissance and the associated “flowering of art and literature and scientific ideas”. But, as Harman also describes, the “discovery” and conquest of the New World brought slavery, famine and disease to many of the people living there. One Spanish observer described the effects on the Inca Empire: “infinite deserted villages on all the roads in the kingdom”. The human population of the Americas declined from an estimated 54 million to 6 million by 1650 and, with fewer people to farm the land, forests started to return and levels of carbon dioxide in the atmosphere dipped. The drop in carbon dioxide level (it reached its lowest in 1610) could serve as a geological marker for this event as it can be detected in

Antarctic ice.<sup>29</sup> The macabre hypothesis is that it may have been the deaths of millions of humans that marked the point when humanity became a significant global force.

While Lewis and Maslin's Orbis Spike proposal incorporates changes to ecosystems and human populations, Crutzen and Stoermer themselves focused more narrowly on energy use and greenhouse gas emissions. They initially suggested that the Anthropocene began towards the end of the 18th century. James Watt developed the steam engine in the 18th century and the first use of a coal fired steam engine to power a cotton mill was in Nottinghamshire in 1786. This is also the time when, according to Crutzen and his colleagues, atmospheric greenhouse gas concentrations started to rise. So, whereas for most of the Holocene levels of carbon dioxide in the atmosphere fluctuated — going up or down by up to 5ppm, since the industrial revolution, carbon dioxide levels have been rising by 2ppm per year. Crutzen and Stoermer also propose a “great acceleration” around the middle of the 20th century — a “remarkable explosion” in which the levels of carbon dioxide in the atmosphere have begun to shoot up even more rapidly.

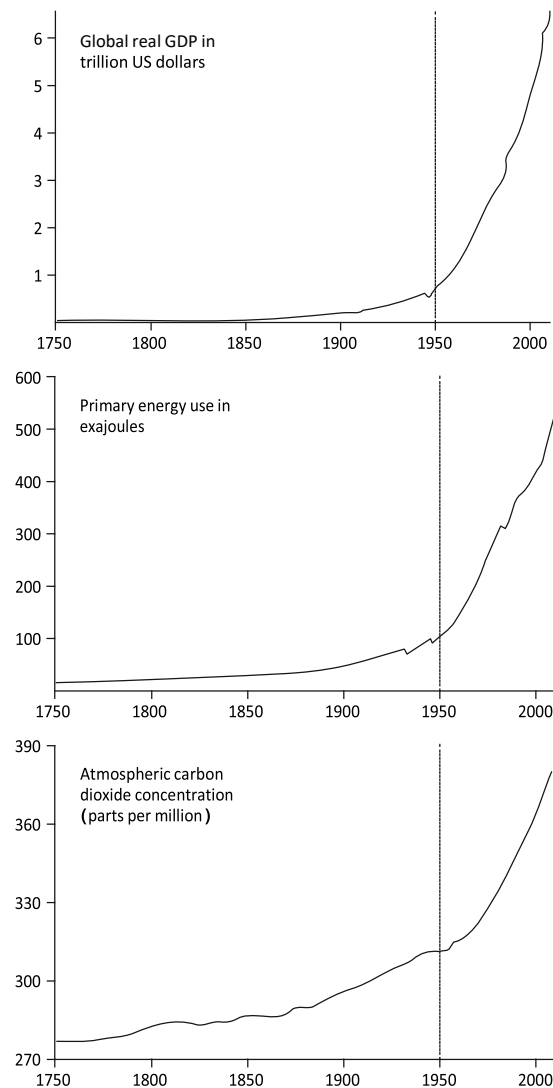
Finally, some have proposed that the Anthropocene actually started in 1945.<sup>34</sup> The first nuclear weapons test (and the first usage of nuclear weapons in war) took place in this year and testing continued throughout the 1950s and 1960s, declining sharply after the Partial Test Ban Treaty in 1963. The effects of nuclear testing can be detected globally by measuring levels of radioactive isotopes in polar ice, lake sediments and tree rings. There is a clear peak in the levels of carbon isotopes from nuclear weapons in tree rings around this time that could act as a golden spike and it is absolutely unambiguous that this was caused by human activity. This is, of course, extremely recent for geologists used to dealing with time periods of hundreds of thousands of years.

Like the iridium deposits that mark the start of the Cenozoic, this does not mean that nuclear weapons testing was the most significant thing that happened at the time. To be considered the start date of the Anthropocene it would merely have to stand in to represent a time in which a profound shift in human societies and a related impact on planetary processes occurred. This is precisely what Earth System scientists are saying happened at around this time:

The second half of the twentieth century is unique in the entire history of human existence on Earth. Many human activities reached take-off points

sometime in the twentieth century and have accelerated sharply towards the end of the century. The last 50 years have without doubt seen the most rapid transformation of the human relationship with the natural world in the history of the species. The time period of roughly 50 years ago is also consistent with the notion of a great acceleration although this is increasingly coming to be seen as the start of the Anthropocene epoch rather than a turning point within it.

Figure 1: Global real GDP, primary energy use and atmospheric carbon dioxide



Source: Will Steffen, Wendy Broadgate, Lisa Deutsch, Owen Gaffney, and Cornelia Ludwig, “The Trajectory of the Anthropocene: The Great Acceleration”, *Anthropocene Review*, 2015.

A 2015 paper by the Anthropocene Working Group — the group of scientists and others tasked with potentially adding the Anthropocene to the geological record — favoured a mid-20th century start date: “a pronounced, relatively sharp threshold in human modification of the global environment”. In summer 2016 the group’s 35 members voted overwhelmingly that the Anthropocene is stratigraphically real and should be formalised. Furthermore, there were 28.3 votes for a start date around 1950, far more than for any other start date proposal such as the Orbis Spike and earlier potential start dates. Plutonium

fallout was the most popular choice of primary signal. Although the group do recognise that humans have left an impact on the stratigraphic record since before the start of the Holocene, the majority now agree that this influence intensified around the mid-20th century to such an extent that this point can be seen as the end of the Holocene.

The period since the Second World War has involved rapid population growth, urbanisation,<sup>40</sup> the intensification of agriculture and the widespread adoption of consumer goods such as televisions, cars and fridges. A marked increase in the adoption of disposable packaging at this time causing a huge waste problem is just one example of the environmental consequences of the shift. Graphs of global GDP, energy use and carbon dioxide levels in the atmosphere is “hockey stick” shaped, showing a notable upturn around mid-century (figure 1, opposite).

Debates among geologists about when the Anthropocene began may seem far removed from, or even a distraction from, the more urgent task of dealing with climate change. However, differing views on when the Anthropocene began are often

associated with very different interpretations of both its causes and potential solutions. Advocates of the various early Anthropocene hypotheses have been criticised for “normalising” global environmental change. By arguing that the environmental problems of today have their roots in the emergence of human civilisation, early Anthropocene theorists play down the dangerous effects of climate change and the speed with which these environmental problems need to be addressed to avoid a catastrophe. This loses the power to shock and is one of the intriguing things about the Anthropocene diagnosis in the first place. Ian Angus supposes that these views are being promoted by anti-environmental lobbyists.

Holocene conditions could hardly be described as benign. There have been disasters such as earthquakes, volcanoes, tsunamis and famines throughout the epoch. For much of the world’s human population life has always been precarious. Nonetheless, the Holocene is often thought of as relatively conducive to human wellbeing compared to what the Anthropocene might bring: “Holocene conditions are the only ones that we know for sure are compatible with complex human societies”. Therefore, Angus prefers the idea that the Anthropocene started in the mid-20th century and refers to a global

catastrophe with a very rapid onset that everyone should move quickly to address. So why are some on the left sceptical about discussions of the Anthropocene?

### **How not to talk about the Anthropocene**

There is a particular narrative associated with the Anthropocene that is indeed highly problematic politically. The standard narrative goes something like this: there is something inherently destructive about humans; it is therefore inevitable that we have now reached the Anthropocene; all humans are implicated in this to some extent; as there is little we can do to change human nature we may need to take drastic measures (geoengineering) to fix the problem. For some proponents of the standard Anthropocene narrative, humanity's ability to use fire has led humans to manipulate the planet like no other species. When we figured out how to start fires in the distant past, it led in a linear progression to a situation where humans would at some point learn how to extract fossil fuels. We would inevitably end up burning those too. This kicked off a chain of events that led to a rapid expansion in fossil fuel use and the skyrocketing carbon emissions we can observe today. According to one scientific paper: "The mastery of fire by our ancestors provided humankind with a powerful monopolistic tool unavailable to other species that put us firmly on the long path towards the Anthropocene".

This narrative involves a paradox. Humans seem to have more agency than we have ever had in the past. For the first time in human history we are able to push the whole planet into a new epoch. However, it is also assumed that we have very little agency actually to change the situation, faced as we are with the prospect of unleashing global forces that we have little power over except perhaps by unprecedented technological intervention.

Anthropocene scientists have referred to the "great forces" of nature, arguing that: "human activities have become so pervasive and profound that they rival the great forces of Nature". This evokes the narcissistic notion that humanity is separate from the rest of nature and acts in opposition to it. In contemporary environmentalism, including in some discussions of the Anthropocene, this separation of nature from society is particularly problematic. It provides a philosophical underpinning to the notion that humans are nothing but an impact on "nature" and that the best thing we could do to "save nature" would be to scale back "our" impacts and try to leave the rest of the world alone. The



standard narrative implies that “nature” was somehow pristine and unspoilt before human influence reached the levels that it presently has. Scientists have even stated that: “Earth has now left its natural geological epoch”, implying that there was something “natural” about the Holocene epoch. Recall that the Holocene itself only represents a very short period in geological terms, essentially a mere interval between ice ages, and that humans were already starting to influence the external environment during this time.

At the same time we are told we are overcoming the forces of nature, we are also a force of nature ourselves; human destructiveness is seen as somehow intrinsic to our own human “nature” so that the Anthropocene is simultaneously both a natural and an unnatural phenomenon. By contrast a Marxist approach (of which more later) would need to proceed from a much more sophisticated, dialectical understanding of the role of humans within the natural world.

The dominant Anthropocene narrative has been criticised as post-political, with post-politics defined as “a socio-political arrangement that replaces ideological contestation and struggles by techno-managerial planning” and where “the space for political contestation, debate and reorientation is also restricted”. In other words, the narrative (as with some of the narratives around climate change more generally) tells us that we are all in it together. Precisely because climate change is viewed as a problem for the whole of humanity, we are told that we should put aside any differences of opinion over the nature of the problem and work together to achieve a common solution. This tends to restrict political debate to very narrow questions around the type of technology to adopt.

Perhaps unsurprisingly then, Crutzen himself has suggested that high-tech geoengineering solutions might be needed to solve climate change. He has been sceptical about whether humans can get out of the climate situation quickly enough by political means and he favours a strategy of trying to cool the climate by firing sulphur into the air. It is beyond the scope of this chapter to discuss the issue in full. However, one criticism of this approach, as a technological solution to a problem caused by capitalist society, is that even if one of the various proposals were to actually work (by no means guaranteed), it would address the symptoms but not the ultimate cause of climate change. Cooling the planet down would not solve any of the other multiple environmental problems beyond global warming and would almost certainly have its own negative consequences. A more immediate concern is that, as climate scientist Kevin

Anderson has pointed out, the promise of possible geoengineering fixes in the future can feed into political inaction today. The targets for greenhouse gas reduction set at the most UN talks in Paris in 2015 fell short of the radical action that is needed as they were premised on the idea that humanity would, at some point, come up with a way of sucking carbon dioxide out of the air. Although it is not Crutzen's intention, geoengineering may have gone from being a "last ditch Plan B" to part of the only plan.

Related to the post-political narrative is the perverse idea that the Anthropocene is "good" or "great" and is something to be embraced. Erle Ellis points out that Homo sapiens is not the first species to have altered its external environment — when green plants first evolved they changed the atmosphere dramatically by producing oxygen, for example. But humans are, unlike plants, conscious of the effect we have on the rest of the planet and able to change our actions. This is a reasonable point to make, but for Ellis it comes tied to the idea that we have finally "woken up" to the negative effects we are having and just need to put the knowledge that we are in the Anthropocene to good use:

The boom in Anthropocene discussions might itself indicate that societies are waking up to the realities of becoming a global force in the Earth system...we might guide this new "great force of nature" toward better outcomes for both humanity and nonhuman nature. It is time to embrace what makes us human, ultrasociality, and turn it towards the grand challenges of the Anthropocene — to intentionally build better societies and cultures of nature.

Advocates of the idea of a good Anthropocene have described it as a great opportunity to offer an "optimistic vision" of a future society founded on increased use of technology. They have even criticised mainstream environmentalists as being too pessimistic in raising concerns about natural disasters or resource depletion. Again, there seems to be little discussion of who will be responsible for implementing all the proposed technological innovations.

However, not everyone who uses the term Anthropocene has adopted the dualistic thinking of the standard narrative. For some commentators, rather than demonstrating the human impact on nature, the Anthropocene idea is useful precisely because it forces us to acknowledge how closely entangled human activity is with the rest of nature. After all, every terrestrial living thing lives in an environment that has a higher concentration of greenhouse gases in it than it would without humans. Therefore, the Anthropocene idea could also

make a contribution to a body of work within the social sciences that has always criticised the concept of “nature” as something separate from human society. One example of such an approach — although not written from a Marxist perspective — is Jamie Lorimer’s book *Wildlife in the Anthropocene*, which uses the idea of the Anthropocene to draw attention to the wildlife that lives in human created environments such as cities, therefore criticising the association of nature with “wilderness”.

### **An Anthropocene myth?**

One prominent critic of the Anthropocene narrative from a leftwing perspective is Andreas Malm. Malm is an academic and an activist who is rightly strongly critical of the lack of action by delegates at the Paris talks in 2015. He calls for “militant resistance on the streets” to confront climate change. Clearly he is far from complacent about the scale of today’s environmental problems. So why has he referred to the “Anthropocene Myth”?

In his critique of these ideas Malm returns to Crutzen’s suggestion that the Anthropocene began with the invention of the steam engine, the industrial revolution and the associated increase in fossil fuel use. He offers an important counternarrative to the idea that this was a direct result of humankind’s earlier mastery of fire, pointing out that Crutzen and others do not say a lot about what actually caused the adoption of steam power in Britain around the 1830s. Basing his arguments on a detailed historical analysis, he shows how the rise of the steam engine came about in a capitalist society and served a particular purpose at the time.

Malm argues that steam engines were not technologically superior to alternative forms of technology such as the water wheel, either in the amount of energy that could be produced or how cheaply it could be produced. In fact for an individual factory owner buying coal was the more expensive option. However, coal did offer several other advantages for the capitalist: It provided a regular supply of energy; it didn’t require different capitals to band together and invest in infrastructure in the way that water did; it could be used at a convenient time of day; and perhaps most notably, steam power brought industrial production into cities such as Manchester. Cities increasingly provided a plentiful supply of cheap and exploitable labour power. Note that, for Malm, steam power was “presupposed” by an early capitalist system in which a small

minority owned the means of production and much of the rest of society were being drawn into wage labour:

While it is admittedly banal to point out, steam engines were not adopted by some natural-born deputies of the human species. The choice of a prime mover in commodity production could not possibly have been the prerogative of that species, since it presupposed, for a start, the institution of wage labour. It was the owners of the means of production who installed the novel prime mover.

Central to this argument is the idea that climate change is political, and the adoption of coal came about as a result of class struggle. The Anthropocene was brought about consciously, not in the sense that capitalists then understood or predicted climate change, but nevertheless they did take concerted action, in the face of fierce resistance, to shift human evolution.

Another point that follows from Malm's general line of argument is that, of course, we as the human race are not all equally responsible for the burning of fossil fuels. The shift to such a system was brought about by a particular subset of the human species in the 19th century: wealthy, white, British and male. To this day the responsibility for carbon emissions cannot possibly be said to lie with humanity as a whole. A person's individual energy consumption depends to an overwhelming extent on the type of society they live in. The energy consumption of an average Canadian is a staggering 1,000 times greater than that of a typical farmer in the Sahel. Overall, the poorest 45 percent of humanity generate just 7 percent of the carbon emissions.

It is worth noting here that Malm's argument is not necessarily a critique of the word Anthropocene per se. What he objects to is a particular narrative associated with its use. But equally it is fair to say that he is sceptical about how useful it would be for Marxists to take up the term Anthropocene.

There is much to agree with in Malm's arguments. It makes sense to try to politicise climate change and to point the finger at the capitalists rather than the "Anthropos" or humanity in general. The environment could once again become a site of class struggle. People are starting to engage in climate activism in greater numbers, most recently with the growth of groups like Extinction Rebellion and the extraordinary global school strikes. For many, radical slogans such as "system change, not climate change" make sense. Struggles over climate jobs, where trade unionists and others demand jobs that could cut emissions, over the local environmental consequences of resource extraction

(fracking, tar sands extraction, gold mining, etc) and over the impacts of the extreme weather events all start to raise the issue that when it comes to climate change we are not “all in it together”.

However, several commentators, including Marxists, have argued against dismissing the notion of the Anthropocene. Much of Malm’s argument hangs on a critique of Crutzen and of a few others with particularly problematic views. But the debates around the Anthropocene are becoming much wider than that. It seems premature to associate the Anthropocene so closely with the industrial revolution especially as the Anthropocene Working Group prefer a more recent start date. Also, in fairness to these scientists they are aware that not all humans are equally to blame for climate change. Crutzen himself has argued from early on that only 25 percent of humans are responsible. After receiving some criticisms from social scientists, further work has been produced that differentiates between humans at least based on whether they live in rich or poor countries, although this is not the same as a historical and class analysis of the ultimate roots of the problem.

Malm tends towards explaining historical developments in terms of class struggle between one group of humans and another where the most powerful group will win out (an approach that could be described as class struggle determinism). This examination of what happens between humans gives very little emphasis to the way human societies develop in a relationship with the rest of nature. Jason W Moore has sharply criticised this type of thinking, pointing out that “human activity not only produces biospheric change, but relations between humans are themselves produced by nature”. Moore consequently argues that the origins of the epoch should be traced to profound shifts in socio-natural relations beginning as far back as the late 15th century with the origins of the capitalist system rather than with the 19th century expansion in fossil fuel use.

For many, the Anthropocene gives a name to a phenomenon that is actually happening in reality and for which the scientific evidence is overwhelming. What is therefore needed is an understanding of the causes of the Anthropocene rather than a rejection of the word itself. It has also, to some extent, started a discussion among scientists, activists and members of the public about the environment and humanity’s role within it which is surely to be welcomed.

## Towards a Marxist approach

To understand the Anthropocene requires an approach that studies the earth as a complex system in which living things, including humans organised in societies, play an active role. To quote Will Steffen and others:

Crucial to the emergence of this perspective has been the dawning awareness of two aspects of Earth System functioning. First that the earth itself is a single system within which the biosphere is an active, essential component. Secondly, that human activities are now so pervasive and profound in their consequences that they affect the earth at a global scale in complex, interactive and apparently accelerating ways.

Making sense of this system will need ideas from both the social and the natural sciences. And it will require an interpretation of how a complex system can undergo change gradually or abruptly. It is entirely possible to argue that humans have always existed in a complex relationship with our environments but also that there have been recent and decisive shifts in the nature of this relationship and therefore to take the recent Anthropocene proposals seriously. None of this is alien to Marxist thought. In fact, the approach outlined by Karl Marx and Friedrich Engels to humanity's role within the natural world and subsequently developed by more recent generations of Marxists offers a sophisticated basis on which to assess the implications of the Anthropocene.

Ellis argues that the Anthropocene requires us to understand why humans, rather than any other species, became a global force. How and why did we go from hunting and gathering to living in agricultural societies and, later, more complex societies with cities, diverse job roles and rapidly developing technology? How did we reach the point where we are changing the natural world so profoundly that our influence can be measured in the geological record? These are questions that Marxism can play a role in answering. Marx begins his own analysis of the labour process in *Capital* by pointing out that humans act on external nature but at the same time also change themselves. It seems he would have agreed on the point that humans have differentiated ourselves from other animals in our ability to transform the rest of the world. He famously argued that:

A spider conducts operations which resemble those of a weaver, and a bee would put many a human architect to shame by the construction of its honeycomb cells. But what distinguishes the worst architect from the best of

bees is that the architect builds the cell in his mind before he constructs it in wax.

So, humans are able to manipulate the natural world with a qualitatively greater capacity for conscious and intentional action than other animals (although we are not all-powerful, our actions can also have unforeseen and unintended consequences).

Humans evolved from the same ancestors as other animals so our differentiated abilities cannot have been innate but must have arisen in a process of evolution; Engels offered one hypothesis as to how human capacities evolved from those of our primate ancestors in his short essay "The Part Played By Labour In The Transition From Ape To Man".<sup>69</sup> This transition, he supposed, took place as a result of our ancestors' manipulation of the external environment mediated by labour. As he concludes:

All the planned action of all animals has never succeeded in impressing the stamp of their will upon the earth. That was left for man. In short, the animal merely uses its environment, and brings about changes in it simply by its presence; man by his changes makes it serve his ends, masters it. This is the final, essential distinction between man and other animals, and once again it is labour that brings about this distinction.

The transition "from ape to man" represented a qualitative shift in the ways in which humans related to external nature. So Marx and Engels had already laid the basis for an understanding of the ways in which a further shift might have taken place as we pushed planetary conditions from Holocene to Anthropocene.

Marx's point that we change our nature as we adapt external nature is also a starting point for a much more sophisticated understanding of human nature than the simplistic approach associated with some interpretations of the Anthropocene. All humans share basic needs due to our biology such as the need for food, water, sleep and shelter, etc; we can criticise capitalism on the basis that it cannot adequately provide for our needs. But there is no reason to suggest that we have always been individualistic, violent or competitive. Rather "our nature is in a constant process of evolution". Our behaviour and psychology have changed dramatically throughout history as we have lived in different types of society. For Marx there is no essential "human essence" that can be abstracted from social relations.

As some are arguing that there is something innate in humans that compels us to burn fossil fuels, Marxist understandings of human nature and how it developed in line with the needs of different types of society are clearly relevant here. Indeed, the idea of a fixed and inherently destructive human nature that is responsible for environmental problems has been effectively criticised. For example, in an article on biodiversity conservation Ian Rappel locates the origins of this misanthropic thinking in biological determinism, which suggests that our apparent tendency towards destructive behaviour can be explained by our genetic make-up.

Human action involves a complex relationship with the natural world but we do not relate to it just as individuals. We are also social beings whose relationship with nature varies with the type of society we live in. Recognising this basic point is central to the approach to environmental issues developed by writers in this journal and elsewhere. It allows us to show how environmental problems arose as societies changed throughout history and serves as a basis on which to study the specific ways in which capitalism is damaging. It also means we can envision a future socialist society where a more rational approach to the environment will correspond to more democratic and egalitarian social relations.

Although human societies involve a relationship with the environment, capitalism differs from previous societies in its detrimental effects. Whereas feudal lords, for example, would exploit the peasants and serfs, they only needed to do so to satisfy their own material needs and those of their entourage. In a capitalist society individual capitalists are compelled to compete against each other to accumulate more surplus value by exploiting their workforce. If a capitalist fails to extract surplus value and invest it in further production they risk going out of business Klein explains how this happens in the contemporary fossil fuels industry. Companies that do not have access to oil and gas reserves to meet expected future demand lose out as their investors put their money elsewhere and are therefore forced to search the globe for more places where they can drill. This constant drive towards accumulation turns more and more of the natural world into commodities that can be used. As Moore describes, as capitalism entrenched itself globally from the mid-15th century onwards it stalked the earth in search of more commodities, such as iron, silver, timber and sugar, cutting down forests at a rapid rate as it went. The development of capitalism has therefore gone hand in hand with a huge



expansion in the forces of production — the technology, resources, practices and knowledge available for use in the production process.

Angus agrees that the problem is capitalism, but says that we should seek to understand the environmental implications of a specific development within capitalism after the Second World War, the advent of monopoly capital. The increasing domination of large monopolies limits competition as small firms are denied access to the market. It leads to the creation of an excess surplus for which there are not enough productive outlets for companies to invest in.

Angus also adds that, rather than just being a marker of the divide between the early 20th century and the late 20th century, the Second World War itself was significant to the social changes that came after it. He points out that the war left the United States in a much more advantageous economic position compared to European states, that manufacturing technology was revolutionised during the war and that state investment in armaments and manufacturing more generally continued after the war benefitting US monopolies in particular. The monopoly capital approach has been criticised for over-emphasising economic stagnation in the US and downplaying the role competition plays in Marxist analysis. As outlined above, competition and the search for profits are the ultimate driving forces behind capitalism's destructive ecological role rather than stagnation and monopoly. However, Angus makes a more general point: socialists should analyse the specific ways in which capitalism has changed during the 20th century as well as the workings of the system in the abstract.

Marxists have also argued that, rather than simply “acting on” nature, capitalism can be said to reorganise nature. For example, Rappel also describes the creation of a “capitalist ecology” with its own distinctive characteristics including a tendency towards growing crops in monocultures, exhausting supplies of resources and discharging waste into the environment as pollution: “The ecology that is actively engineered under capitalism is one determined by ruling class aspirations for profit”. If Marxists accept that capitalism constructs a particular ecology, it is not much of a leap to suggest that we are in the Anthropocene. In other words, capitalism has allowed the construction of a particular ecology on a global scale and to the extent that the effects of this can now be understood in terms of a shift from one geological epoch to another.

If the Anthropocene started in the last few centuries, or even as recently as the middle of the 20th century, it must have arisen due to the influence of

capitalism throughout the world. Humans have lived in many types of society, but only capitalism has given rise to the Anthropocene. Some have suggested that if environmental problems can be located with capitalism not humanity, “Capitalocene” might be a better word to use. This terminology may yet become more popular, especially among radical social scientists. However, one disadvantage is that it is less likely to be accepted by geologists and other physical scientists (it doesn’t fit with the conventions of geological terminology) as well as those who are concerned about the environment but who don’t (or don’t yet) blame capitalism.<sup>84</sup> As the word “Anthropocene” has already entered common usage it may simply be too late to start proposing alternative terms.

Malm argues that discussions of the Anthropocene have been dominated by natural scientists. Writing with Alf Hornborg he has called it “the illogical and ultimately self-defeating foray of the natural science community...into the domain of human affairs”. The authors argue that such people “extend their worldviews to society” and that “geologists, meteorologists and their colleagues are not necessarily well-equipped to study the sort of things that take place between humans”. The argument that follows is that understanding the social reasons for the growth of fossil fuel use for instance should be left to historians and other social scientists. But Marx and Engels themselves would not have been so dismissive of scientific insights or claimed that natural scientists are stepping out of line if they comment on issues that involve humans. Both took an interest in the scientific discoveries of their own time, particularly Darwin’s theories of evolution. This is not to say that they were uncritical of Darwin’s views, which were often rooted in liberal ideology, but they did see how the kernel of his thinking could be important to the development of their own worldview. In this spirit Angus calls for a synthesis of insights from Earth System science and ecological Marxism. He complains about “carping from the sidelines about the scientists’ lack of social analysis” and argues that instead socialists should pay much more attention to what the physical scientists are saying: “ecosocialists need to approach the Anthropocene project as an opportunity to unite an ecological Marxist analysis with the latest scientific research, in a new synthesis — a socioecological account of the origins, nature, and direction of the current crisis in the Earth System”.

There is a danger in accepting uncritically the ideas and the narratives coming from some quarters and especially from the super-optimistic “let’s not let a good crisis go to waste” purveyors of the “good Anthropocene” argument. But

there are plenty of situations, including climate change itself, where we might not agree with the dominant narrative about the ultimate cause of a problem or the solutions proposed by the ruling class, but where we would agree that the problem exists. If some scientists have ideas that we might find problematic, this isn't helped by socialists dismissing the whole notion of the Anthropocene — effectively leaving the argument in the hands of the right.

Scientists are now telling us that “business as usual...is not a viable option”. If capitalism is allowed to continue, the extinction of humanity is an all too real possibility. In that case the Anthropocene is unlikely to last long and will register as a short geological episode. The alternative is that we can overthrow capitalism and replace it with a sustainable society, one that allows our species to continue.

## CHAPTER 3

### Can We Build a Sustainable Society?

Martin Empson

In December 2015 world leaders, who are signatories to the UN framework on climate change, met in Paris at the 21st annual Conference of the Parties (COP21) . The Paris Agreement as it became known was lauded by politicians as laying out significant action on climate change. Yet the agreement signed in Paris, and those signed at subsequent conferences in Marrakech, Bonn and Katowice offered little real change. In the aftermath of the talks leading UK climate scientist Kevin Anderson argued that even if all the voluntary commitments made in Paris were adhered to, there would likely still be a three or four-degree temperature rise.

Such a rise will not simply lead to a warmer world; it will mean environmental disaster. Such a rise will make runaway climate change more likely and cause major sea-level rises with flooding on a huge scale. Hunger, famine and war will likely follow. Millions of people will face devastation.

In response to this the environmental movement is growing. Protests and meetings are larger and tackling big questions. One example of this is the way that trade unions and campaigners across the world are taking up the idea of “climate jobs” as an alternative to climate chaos and austerity. At the same time there is a growing sense within the climate movement that we have to move beyond tinkering with the existing system. One example of this is the popularity of Naomi Klein’s bestselling book, *This Changes Everything*. Subtitled “Capitalism Versus the Climate” the book succinctly summarises many environmentalists’ thinking — the problem is the system, rather than technology, population growth or the wrong diet. Klein locates the climate crisis within a systemic critique of capitalism, a critique that fits directly with the experience that many of us have of austerity politics.

But what is less clear is what a sustainable alternative to capitalism would look like. One frustration I found reading Klein’s book is that her alternative is not actually that different. It is a different capitalism, but it is still capitalism — more localised, more rational. Production is planned through state intervention designed to reduce greenhouse gas emissions at the same time as being more socially just. But it is still capitalism.

Capitalism as a system has at its core competing blocks of capital that strive to maximise their profits through the exploitation of workers. Because this production is based upon the natural world, it has an impact — the environmental degradation of nature through the extraction of resources and the creation of pollution, including emissions of carbon dioxide and other greenhouse gases.

Klein is right then to condemn this ecologically unsound system, particularly its “extractive industries” that she sees as being at the heart of the problem. But even if we could challenge the system and destroy the fossil fuel industry at the heart of capitalism, we would still leave in place a system based on the exploitation of workers and the competitive accumulation of wealth for the sake of accumulation.

Since the COP21 conference there have been intense discussions about the way forward for the environmental movement. These have been exacerbated by the election of right-wing politicians like Donald Trump whose policies have begun to undo even the limited action that has been implemented. In August 2017 Trump announced that he was withdrawing the US from the Paris Agreement.

Revolutionary socialists must be at the heart of these debates. We want to build a bigger and stronger climate movement, but we also have something to offer — a vision of an alternative to capitalism based on the needs and interests of the vast majority of the population. Demonstrating this means exploring again some of the ideas of Marx and Engels.

At the core of the Marxist critique of capitalism is an understanding of the dialectical relationship between humans and the natural world. Karl Marx and Frederick Engels offered a critique of capitalism, but they also explored the way that communism, the society that they envisaged arising out of the revolutionary destruction of capitalism, would also be an ecologically sustainable world.

Unfortunately, many environmentalists dismiss the idea of socialism as a sustainable alternative to capitalism. Part of the problem is the experience of regimes like the Soviet Union, those in Eastern Europe or countries such as China. The leaders of these countries often used the language of socialism and Marxism, yet the central dynamic of production was geared, not towards the interests of workers and peasants, but towards competition with the West. The environmental record of the Soviet Union and the Eastern bloc was appalling, and China continues today to have huge problems with pollution.

The problematic relationship between these societies and the natural world is summed up best by two quotes, one from a Soviet economic planner who called for “a profound rearrangement of the entire living world...all living nature will live, thrive and die at none other than the will of man and according to his plans”. More simply Chinese Communist Party leader Mao Zedong demanded that “man must conquer nature”.

So it is no surprise that some on the left of the environmental movement might want to distance themselves from this. In his 2003 book, *Heat*, activist George Monbiot wrote that “the need to tackle climate change must not become an excuse for central planning”.

But the relationship between society and nature outlined in the thinking of Marx and Engels was far from the crude ideas expressed by Soviet planners, or Mao. Their vision of socialism was one where the use and allocation of resources and the planning of society’s production was done not by a centralised leadership, but by democratic decision-making involving the maximum number of concerned people.

In Capital Karl Marx argued for a vision of communism that was what we would now call sustainable:

From the standpoint of a higher economic form of society, private ownership of the globe by single individuals will appear quite as absurd as private ownership of one man by another. Even a whole society, a nation, or even all simultaneously existing societies taken together, are not the owners of the globe. They are only its possessors, its usufructuaries, and, like boni patres familias [Good Heads of Household], they must hand it down to succeeding generations in an improved condition.

Marx's vision of communism arises in part from his critique of capitalism. He argued that capitalism was born "dripping in blood from every pore", and an essential part of this process was the separation of the majority of the population from their link to the land, "the original source of all wealth". What makes us human is our ability to labour on nature and change it in our interests. Under capitalism workers have become alienated from the natural world.

This "metabolic rift" is one of the key problems in the relationship between society and the natural world under capitalism. Healing this rift is an essential part of the transition to a more sustainable future. Marx talked about the way that once this separation is established it will continue and develop "until a new and fundamental revolution in the mode of production should again overturn it, and restore the original union in a new historical form".

What Marx is describing here is a society which heals the fundamental relationship between humans and nature, but not through a return to an older form of society. Instead a new society must be built. This requires the taking of property into social ownership through the process of revolution. Marx called this new form of society communism, a term inaccurately associated with the regimes that were established in the aftermath of Stalin's victory in the Soviet Union.

Under a genuine communist society, production would become transformed. Under capitalism production is for profit. Manufacturing is based on whether goods can be sold to make money, rather than whether or not they are needed by wider society. In 2009 one of the world's leading wind turbine manufacturers closed its plant on the Isle of Wight. Hundreds of jobs were lost at a time when the world was crying out for wind turbines to expand renewable energy. This was not because of a downturn of orders, quite the contrary — orders were

booming — but because it would be more profitable for the company to manufacture wind turbines in China or the United States.

This emphasis on production for profit means that capitalism is incredibly wasteful of resources. Products that are profitable are manufactured in vast quantities, until there is a glut on the market and a crisis of over-production occurs. Witness the pictures of tens of thousands of unsold cars in manufactures' storage areas, each unsaleable car representing wasted raw materials, energy and labour. At the same time the world needs more coaches, buses and trains to expand and improve low carbon transport.

Marx's vision of production under communism was very different. Writing in the aftermath of the 1871 Paris Commune he said, "United co-operative societies are to regulate national production upon a common plan, thus taking it under their own control and putting an end to the constant anarchy and periodical convulsions which are the fatality of capitalist production." It is a vision that still sounds radical and farsighted.

This democratically planned production is inherently sustainable because at its heart is the way that ordinary people plan and organise their interaction with the natural world. Freed from the restrictions of capitalism, which insists that workers view their labour through the prism of a world geared towards profit, workers could instead collectively plan their work in the interests of wider society.

A society that also ensured that those same workers had access to proper education would mean that, for the first time, workers could see their part of the production process as part of a wider interaction between society and nature.

When Marx and Engels discussed these questions they often looked at the way that, under capitalism, production had been concentrated into huge, polluting towns separated from the wider countryside. This meant an enormous waste of resources as goods and raw materials were transported around.

Engels noted how a rational society would begin to abolish this separation, and central to this were workers "with an allround development who understand the scientific basis of industrial production as a whole, and each of whom has had practical experience in a whole series of branches of production from start to finish. This society will bring into being a new productive force which will

abundantly compensate for the labour required to transport raw materials and fuel from great distances.”

Some critics of Marx and Engels suggest that one problem with their vision of communism is that it sees the natural world as an inexhaustible collection of resources. But Marx and Engels were materialists who were fascinated by the latest scientific discoveries and technological developments. They understood that the problem was the way that capitalism related to the natural world in an unsustainable way.

One way that Marx examined this was to explore the question of capitalist agriculture. Geared towards the maximisation of profits rather than feeding hungry people, agriculture in Marx’s time was suffering environmental crisis in the form of the degradation of the soil as nutrients were removed from the land but not replaced.

A scientific agriculture was possible through the use of fertilisers to revitalise the land. But the barrier to a rational agriculture was not technological, but social. Farmers who couldn’t afford fertiliser could only continue by further destroying the soil, or going bankrupt. At the same time people went hungry because they couldn’t afford food.

How would a new society come about? Marx and Engels based their understanding on the way that engaged in class struggle workers created their own organisations to help organise their fight. These might start as strike committees, but they had the potential to become organisations that could run society from the bottom up. Marx’s understanding of this particularly developed through seeing and building solidarity with the Paris Commune when workers rose up and created the world’s first, short-lived, workers’ state in the French capital.

Since then revolutionaries have witnessed countless other examples of how workers engaged in struggle begin to take control of their own lives. We see examples in every fight that workers take part in. Strike committees might first organise pickets, but they might go on to challenge for leadership of their dispute, if, for instance, the trade union’s leadership is not fighting the way the workers want.

At the heights of struggle, during revolutions, workers form networks of committees, based on democratically elected delegates from workplaces and communities. These councils are part and parcel of the struggle itself. But in



revolutionary times they may take charge of organising food distribution, or the defence of the revolution itself; so they represent the living interests of workers. These revolutionary councils can form the basis for a new way of organising society.

The alternative to capitalism arises out of the struggle against capitalism. But what is important about this is not just the way that the new society is born, and how it is organised. It is also about how workers transform themselves in the process. As Marx put it:

Both for the production on a mass scale of this communist consciousness, and for the success of the cause itself, the alteration of men on a mass scale is necessary, an alteration which can only take place in a practical movement, a revolution; this revolution is necessary, therefore, not only because the ruling class cannot be overthrown in any other way, but also because the class overthrowing it can only in a revolution succeed in ridding itself of all the muck of ages and become fitted to found society anew.

This creation of a “communist consciousness” means that workers remake themselves and put themselves back in their rightful place, as a part of nature, labouring and changing the world around them in the collective interest of people and planet, rather than as atomised consumers relating to nature through an alienated labour process.

Marx and Engels did not know about global climate change, though they understood that capitalism brought with it environmental crisis. Their vision of a communist society takes on a new importance in the 21st century as we see the inability of capitalism to deal with environmental disaster.

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