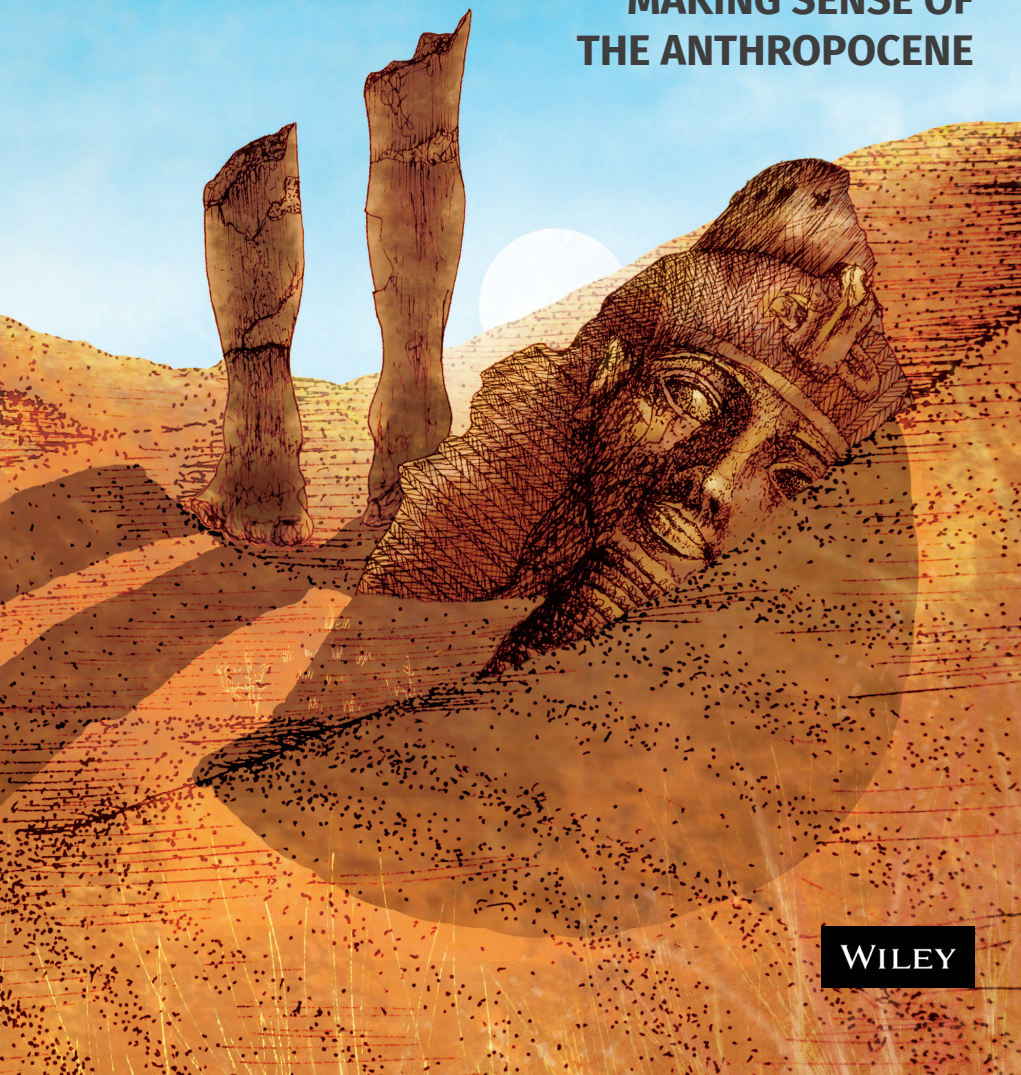
IPPR Progressive Review
Volume 24(3) | Winter 2017

THE ROAD TO RUIN?

MAKING SENSE OF THE ANTHROPOCENE



WILEY

World accumulation and planetary life, or, why capitalism will not survive until the 'last tree is cut'

Jason W. Moore

Why does it seem easier to imagine the end of the world than to see the end of capitalism? Part of the answer turns on a rift between radical economic and ecological thought.

How does capitalism work through the web of life? How can we begin to understand capitalism not simply as an economic system of markets and production and a social system of class and culture, but as a way of organising nature?

I've argued that this is a co-produced relation, that capitalism makes nature and the web of life makes capitalism. But how do we come to terms with planetary 'state shifts' like climate change – dramatic, abrupt, and irreversible moments of planetary change?[1] That is, how do we understand the tendency towards both planetary crisis and accumulation crisis as two moments of a self-forming whole. We have an immediate problem because the way of thinking about these questions in the modern world, after five centuries of colonialism and scientific revolution and everything else, puts society in one box and nature in another. They interact – sort of – but they are very much in different spheres. The answer to these fundamental questions has to begin by acknowledging that the planetary state shift recognised by earth system scientists requires an intellectual and political state shift: a radical shift in how we think about the relations between humans and the rest of nature.

CAPITALISM AND THE 'FOUR CHEAPS'

Crucial to my thinking has been a family of ideas that seek to show how capitalism, from its early modern origins, has been not only a mighty producer of changes in the web of life, but also a product of that web of life, and of the totality of transformations between what is usually called society and nature. This means that modernity never masters or possesses

1 Barnosky AD et al (2004) 'Approaching a State Shift in Earth's Biosphere,' *Nature*, 486, 52–58

nature. Capital not only never subsumes nature, but it has few effective mechanisms for managing its own nature in any given era. The web of life is unruly, rebellious, and has a way of continually upsetting the best laid plans of states, of capitalists, of scientists and engineers.

This is important because the new liberal craze for turning over global natures, including human natures, to market-oriented management represents an important break in the history of capitalism. Longstanding patterns of state and imperial governance of nature have produced a set of conditions of production which I call Cheap Nature. The Four Cheaps – labour power, food, energy and raw materials – are necessary to launch and sustain great bursts of capital accumulation. Today, capital is seeking profitable investment opportunities in a world in which there are really no more significant frontiers of Cheap Nature. These are not significant enough, in my view, to relaunch another golden age of capitalism.

"the new liberal craze for turning over global natures, including human natures, to market-oriented management represents an important historical break in the history of capitalism"

The exhaustion of the Cheap Nature model is happening at a time when, thanks to climate change, the very mechanisms of cheapening labour, food, energy and raw materials are not only breaking down – they are reversing themselves. The reversal will be, like planetary state shifts, dramatic, irreversible – and non-linear. This is most evident in the relationship between climate change and the agricultural model of historical capitalism – the Cheap Food model – based on producing more and more calories with less and less labour time. It's a model that's breaking down because we have reached the moment where the enclosure of the atmospheric commons is now supressing yield growth in the world's four big cereal crops – and because terrestrial enclosures of every kind are now being challenged by agrarian and food justice movements of every kind.

How do we reconcile the dynamics of planetary crisis and world accumulation? The essence of capital in the modern world is that it produces more capital than it can reinvest profitably. This is the surplus capital problem. What's been missed in Marxist political economy is the centrality of Cheap Nature. The truly epoch-making expansions of the modern world have turned on much more than new machines, new markets,

and new economic organisations; they been able to soak up surplus capital because new domains of Cheap Nature have been opened up by states and empires.[2] The resolution of the surplus capital problem, always a temporary resolution, has been fundamentally rooted in the restoration of these Four Cheaps. That's why great industrialisations and "new" imperialisms have always been joined at the hip – there's no mechanisation of textiles without the massive expansion of cotton cultivation in the antebellum American South, for example.

How can we understand the systemic interrelation between socioeconomic and ecological trends, between something like faltering accumulation and sharply rising greenhouse gas concentrations in the atmosphere? Effective answers are going to have to evolve, but to do that we cannot work in the old paradigm of adding up ecology and economy. The relation is much more intimate than such Green Arithmetic allows. We are also going to have to take history much more seriously. Clearly, we are at a moment of fundamental shift in the history of capitalism and in the history of the climate system. We are living through the closing moments of the Holocene, a period of unusual climate stability, which began about 12,000 years ago. Over that time, mild climate perturbations, compared to what we are going to experience, were very important in the histories of civilisations. Roman power in the West crumbled quickly after the end of the Roman Climate Optimum around 300 C.E.; feudal power withered in the face of a perfect storm of climate change, disease, and popular revolt after 1300.

This leads to us to ask two big – two really big – questions. Is capitalism capable of surviving through the present climate crisis, which dwarfs the climate shifts experienced by Roman and feudal oligarchs? And what are the ways that capitalism has re-established its conditions for growth and accumulation?

A compelling answer begins by recognising just how dependent capitalism has been on frontiers of Cheap Nature: those places where food, energy, raw materials and workers can be drawn for free or low cost. Most radicals – never mind the would-be technocratic managers of a geoengineered climate system – still ignore this history. Somehow it's easier to denounce the environmental degradation, the mass produced violence and genocide, the dynamics of domination, than it is to see how each of these moments

2 Moore JW (2017) 'The Capitalocene, Part II', *The Journal of Peasant Studies*, online in advance of print

is linked to the system of Cheap Nature and the endless accumulation of capital. But that won't do. An understanding of how capital accumulation works, how it unfolds through the web of life, is fundamental to understanding not just why capitalism drives planetary crisis, but how its contradictions compel it to continue down this deadly and self-defeating path. Such an analysis may also reveal capitalism's weaknesses – it may serve an antidote to the pervasive belief, even among radicals, that capitalism is all-powerful. It also won't do to keep the 'social' and 'environmental' separate because the questions of how capital works, how capitalism destroys life, and how modernity requires racialised, gendered, and colonial violence are interpenetrated. That interpenetration is key to how capitalism has thrived in the past, and to how capitalism's resilience is now in question.

Our usual understanding of this planetary crisis comes from a philosophy of history that says "Humans did it!" It's a philosophy that says the drivers of planetary crisis are anthropogenic. "Humans are overwhelming the great forces of nature" – in the words of the Popular Anthropocene.[3]

"Anthropogenic implicates an actor that doesn't exist. There is no Anthropos, no humanity as a unified actor"

There's a big problem with such explanations. Anthropogenic implicates an actor that doesn't exist. There is no Anthropos, no humanity as a unified actor. So, if not anthropogenic, what? In a word: *capitalogenic*. Let me be clear about this term, and about the idea of the 'Capitalocene'. Liberals complain that there's plenty of responsibility to go around, and that capitalists aren't the only ones to blame. The Capitalocene doesn't say that the One Percent are completely to blame for the crisis. (But, just to be clear, the One Percent *are* completely to blame for the crisis.) The Capitalocene argument isn't about blame; it's about identifying the system that has devastated life on this planet.[4] It's about making clear the history of capitalism. The Capitalocene is a way to begin to ask how the accumulation of capital, the pursuit of power and the co-production of nature form an organic and evolving whole. That whole is a 'world-ecology'. To say capitalogenic is therefore to invoke not just economics – whatever that might mean – but the power and violence that has made endless accumulation possible. Where many radicals see only

3 Steffen W, Crutzen PJ and McNeill JR (2007) 'The Anthropocene: Are humans now overwhelming the great forces of nature', *AMBIO: A Journal of the Human Environment* 36, no. 8: 614–21

4 Moore JW (2017) 'The Capitalocene, Part I: On the Nature and Origins of Our Ecological Crisis', *The Journal of Peasant Studies*, 44, no. 3, 594-630

capitalism's entropy, destruction, and devastation, world-ecology embraces the life-making alternatives forged in resistance to such domination. To say that capitalism creates an ecology of power, capital, and nature in its own image is also to underscore the fragility of capitalism's ecologies, and the power of a web of life that is continually upsetting the plans of the rich and powerful. This is what world-ecology celebrates: the intimate connections between the life-making resistances, and emancipatory possibilities, of a web of life that incudes humans.

CHEAP NATURES AND THE GREAT FRONTIER

Much environmental thinking and social theory says that all the troubles started in England with the advent of coal and steam. Such periodisation matters greatly to our politics. For one, this narrative – a very old narrative that stretches back more than a century – reveals a long-held love affair with big machines. The old Anglo-centric reading of capitalism has the disabling effect of rendering slavery, colonialism, and gender secondary: we are back to the old "forces of production" argument and its tragic history of rendering Nature a productive asset. It is not even clear that the steam engine was the key machine of industrialisation in the late eighteenth and early nineteenth centuries. Was not the cotton gin arguably more pivotal? Marx thought so, when he observed that it was only the enormous fall in the price of cotton that made large-scale industry possible.[5] This is no mere historical quibble. For the productivist view of Nature lends itself quite readily to the view of race and gender as dependent variables, forgetting, as Federici reminds us, that the violent binaries of race and gender were themselves strategic pivots of accumulating surplus work/energy. Racial and gendered formations were themselves, if one can forgive the old-fashioned language, "forces of production". Of course, these binaries were not invented in the Industrial Revolution; they were its fundamental preconditions.

"The old Anglo-centric reading of capitalism has the disabling effect of rendering slavery, colonialism, and gender secondary: we are back to the old 'forces of production' argument and its tragic history of rendering Nature a productive asset"

5 Marx K (1971) *Theories of surplus value*, Vol. III, Moscow, Progress Publishers

If not the Industrial Revolution of the long nineteenth century, when should we say that capitalism began? In my view, the origins of capitalism are found in what the great French historian Fernand Braudel called the "long" sixteenth century, more or less the two centuries after 1450.[6] But to keep it simple, let's say 1492, Year Zero of modern power, genocide, and capital accumulation. And let's call October 12, 1492 the birthday of Cheap Nature. For Columbus was not merely a navigator and conqueror: he was an assessor of Cheap Nature. His diary of the First Voyage expresses a strong desire not merely for gold – mentioned some 70 times – but also to identify what kinds of life could fetch a good price in Europe. Columbus carried forth not merely guns, germs and steel, but the keen eye of an assessor who sensed the New World's potential riches. Columbus channelled the logic of Cheap Nature from the very beginning.

Cheap Nature has never been a bargain. Cheapness is violence; it grows from the barrel of a gun. It's an utterly irrational system of rationality, one premised on mobilising the work of all natures – humans included – for free, or for as close to free as possible. That's crucial because capitalism is everything that an efficient system is not. Capitalism's prodigious waste of life and limb is fundamental to its logic. When Marx called capitalism a system of turning children's blood into capital, he was making a very important point. Such inefficiency requires and necessitates violence, at once cultural and material. And so Cheap Nature is also necessary because capitalism is not even price-rational. Capitalism pursues Cheap Natures so relentlessly because the ecology of capitalism is its precise opposite: capitalism's ecology is expensive. And worse still, it becomes more expensive over time, because the fantasy of endless accumulation feeds on the bodies of finite lives and labours.

This means that capitalism is not only a system of Cheap Nature but expresses the ethos of the cheapskate: the capitalist system is one where the rich and powerful never pay their bills. They are always too big to fail, too powerful to go broke. That there have been plenty of exceptions should not obscure the world-historical pattern. Capitalism is a system of expensive nature and capitalists are always inventing new ways to avoid paying their debts. Capitalists don't want to take on the cost of raising families, of reproducing society, and of reproducing fields or forests. So, what do you do? You go to the frontier.

6 Braudel F (1953) 'Qu'est-ce que le XVIe Siècle?' *Annales E.S.C.*, 8, no. 1, 69-73

"modernity's commodity frontiers are not simply about commodities; they're about the cultural and territorial projects that make possible the appropriation of unpaid work/energy – the work of 'women, nature, and colonies'"

Frontiers are just not spaces "out there." Frontiers are made. Nature doesn't exist as a set of pre-fabricated use-values; nature's utilities and work potential have to be identified, mapped, secured, and legitimated at every step from "raw material" to finished product. We think of this as an economic and technological dynamic, which it is. But it's also profoundly cultural. So for me, modernity's commodity frontiers are not simply – or even primarily – about commodities; they're about the cultural and territorial projects that make possible the appropriation of unpaid work/energy – the work of "women, nature, and colonies".[7] Here we come face to face with what Max Weber called the "the European rationality of world domination". That rationality has been, like racism and sexism, a powerful force of production, an indispensable lever of what I've called accumulation by appropriation.

This opens our eyes to the ways that the history of the modern world is not just about the bloody violence of colonialism or the deployment of big machines. It is also about "soft" technologies, like bookkeeping and cartography. If historians today talk about 'globalisation' stretching back millennia, there's no question that modern globalisation began with the invention of the "global" through modern cartography. We think of imperialism as movements of armed commerce and militarised production and plunder, and they were. But the great innovation of early capitalism – the trans-oceanic empire – was possibly only through maps, like the famous and still hegemonic Mercator projection, that allowed one not only to navigate planetary space, but to imagine its subordination to the pursuit of profit and power. It still strikes me as curious that we deify the steam engine while relegating the modern map to a footnote. But was not modern cartography – and its sibling, modern surveying – the very basis of the modern control of space, of global nature, of the creation of capitalism's most basic real abstraction, property?

Here was capitalism's God trick (to borrow from Haraway): to re-present the world in "objective" form.[8] This trick accomplished two big things: it

7 Mies M (1986) *Patriarchy and accumulation on a world scale*, London: Zed

8 Haraway D (1988) 'Situated knowledges: The science question in feminism and the privilege of partial perspective', *Feminist Studies*, 14, no. 3, 575-599

concealed capital's desire for domination under the guise of objectivity and, in the same breath, it enabled the practical tasks of world domination.

That raises a vexing question for radical thought: How do the practical matters of domination facilitate the practical matters of exploitation, and vice versa? One recent move is to make clear that epoch-making technologies under capitalism are fundamentally rooted in the exploitation of the worker by the capitalist. The history of technology and resources is a history of class struggles between bourgeois and proletarian. That seems to me a valuable insight, but also one easily suffocated by the kinds of formalisms that have so often plagued Marxists, and not only Marxists. Too often, the "working class" has been defined in ways that bear more than a passing family resemblance to the real abstraction, Society. Marxists have too often embraced unduly narrow conceptions of work and "the worker". For this reason, I've emphasised work/energy, because we are dealing with work in a broadly biophysical sense, comprising the activity and potential energy of rivers and soils, of oil and coal deposits, of human-centred production and reproduction.[9]

At this point, the critics have objected: "Aha! You are flattening all work. Do you not recall how Marx insists that the worst of architects is better than the best of bees?" Which of course misses the point. For starters, there are no architects without bees – a reality that bears repeating as we learn more about colony collapse disorder. But to insist on the essential unity of work/energy – as I think Marx does in the early pages of Capital – is to establish the basis for a more dialectical conception of work. For Marx, and this is the method I tried to follow in *Web of Life*, such general abstractions offer a provisional structure through which to investigate the irreducibly combined and uneven character of work under capitalism. General abstractions yield to progressively more determinate abstractions across the time and space of historical capitalism. Far from reducing all work/energy, identifying the essential connection of life and work in the web of life allows us to see more clearly how the formalised structures of wage-work fundamentally rely on other – distinctive and no less real – forms of work, by humans and the rest of nature.

Those other forms of work are the terrain of surplus profit realised through extra-economic means: accumulation by appropriation. This has far-reaching political as well as analytical implications. I think Marx glimpsed the danger when he warned the German socialists of the dangers

9 Moore JW (2015), *Capitalism in the Web of Life*, Verso

that lay in attributing "supernatural" powers to labour.[10] (And where he reminded his comrades that labour, too, was a force of nature in its own right.) Masculinism, racism, colonialism, and economism have too often infected such thinking with formal definitions of what, when, and who is a worker. To account for "the" Industrial Revolution in terms that elide the enclosure of female bodies within a Lockean "private sphere", premised on the redefinition of women's concrete labours as non-work, is of course to ignore the gendered oppression that is directly constitutive of modern class relations. This is more than an assertion that gender matters – which it always does. Even if one maintains an Anglo-centric narrative, there's no question that the relations of work that defined the Industrial Revolution could not exist without birthing and sustaining the modern proletariat – an "event" that necessarily predates the nineteenth century. Care work is not a footnote to the "real" history of capitalism's ecologies; it is the precondition of those ecologies. In other words, attention to the class struggles around who is a worker and what constitutes work – struggles unfolding in overlapping colonial, racial, and gendered domains – changes the dominant masculinist, technology-centred narrative.[11]

"To account for 'the' Industrial Revolution in terms that elide the enclosure of female bodies within a Lockean 'private sphere', premised on the redefinition of women's concrete labours as non-work, is of course to ignore the gendered oppression that is directly constitutive of modern class relations"

To raise the question of work also unsettles the environmentalist narrative. That's a narrative that, even at its most radical, asks, "What does capitalism do to nature?"

That's not a bad question to ask, but I want to turn this question inside out. I want to ask, "How does capitalism put natures to work?".

Let me be clear that asking how capitalism mobilises different forms of work – the unpaid human work of social reproduction, the work of soils and streams, the work of slaves, the work of industrial workers – implies

10 Marx K (1978/1875 original) 'Critique of the Gotha Programme', in Tucker R, ed, *The Marx-Engels Reader*, New York: WW Norton, 526

11 Patel R and Moore JW (2017) *A History of the World in Seven Cheap Things*, Berkeley, CA: University of California Press

synthesis. To ask how capitalism puts natures of all kinds to work is also to recognise capitalism's pathology – and its exterminism. Here's the rub. On the one hand, capitalism works, not because it does terrible things to natures (it does), but because it has been successful at mobilising and appropriating manifold natures for free or low cost. On the other hand, those movements of appropriating Nature have been fantastically violent. So violence is fundamental to Cheap Nature – revealing capitalism's greatest "inefficiency": its destruction and waste of life.

"Capitalism works, not because it does terrible things to natures (it does), but because it has been successful at mobilising and appropriating manifold natures for free or low cost"

Now, this argument seems to have agitated some Marxists. In a kind of sectarianism reminiscent of Spartacist League denunciations, some critics think they've got me: I care only about accumulation crisis and not about the extraordinary violence and devastation wrought by capital at the end of the Holocene.[12] I think that's a tough sell for anyone who's paid attention to the argument I'm making. The whole point of world-ecology is to show how human organisation – including capitalism – is not only a producer of changes in the web of life, but a product of it. That means, among other things, that capitalism not only emerged out of powerful socio-ecological changes – the Little Ice Age and two epoch-making waves of disease (the Black Death and New World pandemics) – but also that the *longue durée* of capital accumulation itself tends to activate forms of nature, including social movements, that cannot be fixed through a productivist ontology of Nature. This is what I've called negative-value: an idea that seeks to capture the ways in which tipping points across the planetary system are wrapped up with the historical drive to accumulate capital and squeeze more work/energy from humans and the rest of nature. Negative-value is a way to connect the "inside" – capitalism's ecology – and the outside, the web of life a whole. It is, above all, an argument that says capitalism faces real limits because of its relations, historically and in the present, with and within planetary life. Those limits are reached because of the dialectical exhaustion of how capitalism puts natures to work on the Cheap.

12 See, for example, Foster JB (2016) 'Marxism in the anthropocene: Dialectical rifts on the left', *International Critical Thought,* 6(3), 393-421

I am therefore sceptical of the environmentalist claim that capitalism will continue, barring social revolution, until the "last tree is cut".[13] Capitalism is much less resilient than the slogan suggests. The tight connection between recessions in the advanced capitalist core and energy prices over the past four decades is enough to tell us that capitalists start to have big problems when basic commodity prices rise. Now imagine that dynamic magnified radically in an era of climate change – an era in which two thirds of the costs of climate change by 2050 will be borne by world agriculture. Many of the same radicals celebrating the analyses of planetary state shifts also deny the same logic at work within capitalism. Capitalism, too often in the radical imagination, assumes supernatural powers, able to withstand planetary crises at will. But have we not already witnessed the outlines of the essential stagnation of capitalism's labour productivity model?[14] Labour productivity growth has slowed and stagnated dramatically over the past four decades – in industry, but also in agriculture, and here the connection with climate change is inescapable.

"Capitalism, too often in the radical imaginary, becomes a steamroller of entropy, able to withstand planetary forces at will. But have we not already witnessed the outlines of the essential stagnation of capitalism's labour productivity model?"

To grasp capitalism as a system of putting Nature to work, we need to take work seriously. That involves re-centring how we think capitalism in the web of life – away from consumption and population, and towards work. When I say Nature, I mean Nature in the uppercase, as a real, lived abstraction through which the structures of capital and power fuse with the structures of feeling. Here is Nature as a way of organising something far more important than fields and mountains and streams and forests: the real abstraction Nature has been a vital tool in the cultures of racialised, gendered, and colonial domination. Not just the idea, but the institutionalisation of Nature as real abstraction has been central to a *longue durée* process of expelling dominated groups of humans from membership in Society. This was true in the English conquest of Ireland – out of which emerged the contemporary meaning of words like Nature, Society, and

13 Foster JB (2009) *The Ecological Revolution*, New York: Monthly Review Press, 206
14 Gordon RJ (2017) *The Rise and Fall of American Growth*, Princeton, NJ: Princeton University Press

European – and it remains true today, as we see in the mass incarcerations of peoples of colour in the United States. These were, and are, colonial populations expelled from Society – but geographically enclosed within the capitalist division of coerced labour.

One is always rightly wary of functionalist explanations. But it seems clear that the mobilisation of Cheap Nature has always been at the core of such expulsions – so different from the xenophobia of pre-modern civilizations. For these were expulsions to keep populations inside and dominated, to expel them from Society while incorporating their labors for bourgeois enrichment. This allows us to move from consumption as the meta-concept of environmental thought towards work, and to begin to think through the history of capitalism within the web of life – and the web of life within capitalism – in different ways.

I've picked on environmentalist thought, but we can't let Marxist thought off the hook either. Marxism has always had a tough time with the dialectics of capital accumulation and capitalist systems of power. Allow me to highlight what I see as a core mis-reading of Marx's political economy. Marxists have long taken for granted the identity of the commodity form and the relations that made that commodity. "Value relations" have long been read as class relations that derive from, or are located in relation to, the immediate process of production. But there's a wider sphere of power that works to take in the Four Cheaps – labour, energy, raw materials and food – that sustain the production and expanded reproduction of commodities. That wider arena is crucial.

In the usual Marxist economic model, here's what we think when we imagine the growth of capitalism: more and more commodification. Everything gets generalised into the cash nexus, into the purchase and sale of commodities. That's hugely important. I want to suggest a different point of view, however. This understands that capitalism organises through a tripartite division of work. Paid work remains central in this alternative. What we have to explain is how the world proletariat expands through qualitative transformations of the unpaid work/energy of human and extra-human natures. We need to explain the expanded reproduction of the world proletariat in relation to its wider conditions of reproduction.

This leads us to a different geography of accumulation and class struggle. It asks us to understand how the production of surplus value is rooted in the appropriation of the largely unpaid work of "women, nature and colonies".

If world accumulation is to be sustained, these dimensions of unpaid work must grow disproportionately to the amount of paid work. Why is that? Well, for a very simple reason. Capitalism, as everyone learns the first week when you study Marx, is dynamic because it produces more material throughput for every unit of labour time. Workers become more physically productive.

They also become more expensive. Marx put his finger on a crucial dimension of the process in his general law of underproduction.[15] For expanded accumulation to remain profitable, capital has to find ways to cheapen what Marx calls 'circulating capital' – raw materials, energy, and other inputs used up in a given production cycle. Circulating capital is part of constant capital – which Marxists usually characterise as machinery. Machines are fixed capital, and just one element of constant capital. That fixed capital is worthless without circulating capital, and the more innovation there is in fixed capital, the more circulating capital is demanded. That's why, for Marx, the fixed capital of the steam engine became central to large-scale industry only after the volume of cotton, the circulating capital, increased sharply and its value decreased sharply.

> **"For expanded accumulation to remain profitable, you have to find ways to cheapen what Marx calls 'circulating capital' – raw materials, energy, and other inputs used up in a given production cycle"**

You also have to keep the costs of labour power cheap, which is not easy. In highly proletarianised societies, labour is expensive and becomes more expensive over time, as opportunities for non-market income contract and the cost of living rises. This is of course a process of class struggle in many ways – not just in the form of strikes and rebellions, but also in the class struggle from above. The great transition from coal to oil over the course of the twentieth century was one such moment, a protracted effort to rid capitalism of contentious workers who not only threatened social peace but also Cheap Energy.[16]

In contrast to the generalisation of the capital model, this alternative asks us to consider capitalism as a system in which islands of commodification are surrounded by oceans of Cheap – or potentially Cheap – Natures. Great

15 Marx K (1981) *Capital*, vol. III, New York: Penguin
16 Mitchell T (2011) *Carbon Democracy*, London: Verso

booms occur when these islands draw upon oceans of Cheap Natures: of African slaves, of Persian Gulf oil, of English coal, Baltic timber, American grain, Mississippi cotton, and on and on.

Capitalism thrives when the cash nexus is modest in relation to accumulation by appropriation. In contrast to the direct exploitation of surplus value in commodity production, accumulation by appropriation names those extra-economic forms of acquiring surplus work/energy in service to capital accumulation – but not yet, or not largely, monetised. Crucially, this is a zone of tremendous violence and cultural domination.

If then we return to our thinking about 1492 and its role in the origins of planetary crisis, we have to be willing to open our imagination about how capitalism works, about how the surplus is extracted, about how value production works. In 1492, for the first time in the 175 million years since the breakup of Pangea, species bridges were created across the Atlantic issue, transforming life to this day.

These were also bridges of guns, commerce, and commodity production. In forging this modern Pangea, early capitalism was able to set two continents of potential work/energy at the service of capital accumulation. It wasn't just plunder. Our modern Pangea was thoroughly productivist, marked by establishment of massive productive systems, especially in silver mining in places like the Andes and in sugar planting in northeastern Brazil and the Caribbean. And just as capital is always in search of a new profit-making opportunity, so too did each production complex go through a long boom and then bust, followed by the rise of new production complexes, new commodity frontiers.

Why? Because capitalism always needs to find not just new frontiers that can be just as productive, but new and expanded frontiers that can be even more productive.

THE EMERGENT BINARIES OF CAPITALISM

Here is an alternative to what I like to call the 'vampire model of green thought': capitalism comes to Planet Earth and sucks it dry. There's some truth to that depletion model, but I don't think it tells us a lot about how capitalism works in the web of life, or about the specific entanglements of planetary and capitalist crisis today. For one thing, capitalism's biggest problem today is arguably not about resource "taps" at all, but in the pollution "sink" – above all the enclosure of the global atmosphere as a dumping ground for greenhouse gases.

"Creating new binaries of gender, of race, and of Nature/Society… emerged as real abstractions out of the bloody processes of conquest and domination"

Capitalism's decisive task is to transform the biosphere's work/energy into value, premised on labour productivity. But there's a catch: rising labour productivity is realised by excluding most humanly productive work, especially so-called women's work. Creating new binaries of gender, of race, and of Nature/Society was never something limited to philosophers. These emerged as real abstractions out of the bloody processes of conquest and domination, and they were central to the consolidation of capitalism. The pedestal of socially necessary labour time is socially necessary unpaid work/energy. This was fundamental to the emergence of capitalism in treating uncommodified natures of every kind as a lever of wealth production that was quickly transmuting into capital.

This capitalism emerged out of the historic defeat of the feudal ruling classes in the fourteenth and fifteenth centuries in the aftermath of the Black Death. It's important to remember that the collapse of medieval Europe was a historic class defeat of Europe's ruling classes – a defeat of such proportions that Europe's One Percent was forced to invent a new mode of production.

One way in which this happened was through the marriage of military power in Iberia with a kind of slaving and banking regime that came out of Genoa. With it came a series of ethnic cleansing campaigns in Iberia with the Reconquista, in the Atlantic islands of the Canaries and then, of course, with Columbus' journey.[17]

This era witnessed a revolution in the scale, scope and speed of environmental change. What took feudal Europe centuries to accomplish happened in decades, or even years, in early capitalism. To get a sense of just how profound these landscape transformations were, take Picardy, in northeastern France, in the 12th and 13th Century. It took 200 years to clear 12,000 hectares of forest. Four centuries later, in northeastern Brazil, at the height of the sugar boom in Bahia in the 1650s, 12,000 hectares of forest would be cleared in a single year. That's two orders of magnitude, and it was not exceptional. Early capitalism marked as great an environment-making revolution in the history

17 Patel R and Moore JW (2017), *A History of the World in Seven Cheap Things*, University of California Press

of humankind as anything seen since the dawn of settled agriculture.

This environment-making revolution was of course material – but "material" in ways that include cultural change with and within machines, power, geology and biology. It was an ecological revolution in Merchant's fertile conception, an interpenetrated web of transformations in production and reproduction and culture.[18] To be sure, this early capitalist ecological revolution was an epochal movement of primitive accumulation. And if that process is often reckoned in terms of enclosure, these enclosures extended well beyond property lines and hedges. Primitive accumulation was also about the forcible expulsion of many humans from Society; it was about the production of Nature, Society, European, and other pernicious real abstractions, all fundamental to capitalist development and colonial rule.

It's no accident that these words – Nature and Society – assumed their familiar meanings in the century after 1550.

The dawn of England's coal revolution really began in earnest in the 1530s, reaching critical mass by 1560, at which point most of England's major coalfields were being worked. England's non-agricultural population rapidly expanded, growing twice as fast as the agricultural population. By 1549, Kett's Rebellion was defeated, the high tide of a growing resistance to capitalist transformation in the countryside. And let's not forget the Irish. By 1541, England intensified colonial rule in Ireland and, in a telling letter, one of Henry VIII's advisors, the Earl of Northampton, urged colonial administrators to "draw all the wild Irish that dwell now dispersed in the woods" and resettle them into English-style towns.[19]

This was part of a discourse that shaped policy around the wild and the civil, Nature and Society. It was not an isolated moment in the rise of capitalism. It was a move that prefigured Spanish colonial policy in Peru during the 1570s. The Spanish reorganised 1.5 million people – the population of Portugal at the time – in order to supply Cheap Labour to the mines of Potosí. Potosí's silver veins had bled dry by the 1560s, intensifying Spain's fiscal woes and threatening capital accumulation across western Europe. No American silver coming out of Potosí meant no Amsterdam, meant no Baltic, and no European shipping ruling the

18 Merchant C (1989) *Ecological revolutions*, Chapel Hill: University of North Carolina Press

19 Moore JW (2017) 'The Capitalocene, Part I: On the Nature and Origins of Our Ecological Crisis', *The Journal of Peasant Studies*, 44, no. 3, 594-630

waves of the Atlantic world. This was as fundamental a moment in the history of the modern world as the rotary steam engine.[20]

This pattern was replayed many times in the history of the modern world from the Dutch in South East Asia in the 1620s, all the way to the American Empire's Strategic Hamlet Programme in southern Vietnam in the 1960s. Just as the English viewed the Irish as savage, the Castilians called indigenous Peruvians *naturales*, a term that went from meaning the inhabitant of a town to, in a colonial context, being part of Nature.

> **"Just as the English viewed the Irish as savage, the Castilians called indigenous Peruvians *naturales*, a term that went from meaning the inhabitant of a town to, in a colonial context, being part of Nature"**

It's important to remember that in primitive accumulation, it's not only people who were expelled from the land. Most human beings in this era, women, peoples of colour, indigenous peoples, were expelled from membership in humanity. They were relocated: into the zone of Nature.

This was not only a history of colonialism. It is also a story of the gendered counterrevolution of early modern Europe. One thing that is now clear from a growing body of social and cultural history, and I think articulated well by Silvia Federici, is that early modern Europe saw a refashioning of the gendered life of early capitalist Europe into Man, Woman, Public and Private. (This was expressed dramatically by the witch hunts.) That counter-revolution would be codified in Locke's political theory, which was not only about Improvement and who was capable of that (white men), but also announced a deeply hierarchical gender dualism of public and private spheres. By 1700, the definition of women as non-workers was nearly completed.[21]

So, here we have Nature and Society, Man and Woman, Black and White, the West and the Rest, as pivotal binaries – real abstractions and fundamental levers of the production of surplus value and of labour productivity. These

20 Moore JW (2010) 'Amsterdam is standing on Norway, part I: The alchemy of capital, empire, and nature in the diaspora of silver, 1545–1648', *Journal of Agrarian Change* 10, no. 1, 35–71; Moore JW (2010) 'Amsterdam is standing on Norway, part II: The global North Atlantic in the ecological revolution of the long seventeenth century', *Journal of Agrarian Change* 10, no. 2, 188–227

21 Federici S (2004) *Caliban and the Witch*, New York: Autonomedia; Patel R and Moore JW, *A History of the World in Seven Cheap Things*

served not just as new systems of cultural domination, but were wrapped up in a wider cosmology of who was – and who was not – part of Society, and part of Nature.

This had quite tangible economic effects. From the 1480s, prices in Europe for a wide range of commodities began to move upwards, and, no surprise here, prices increased faster than wages. Furthermore, the powerful and institutionally grounded system of gendered domination – through witch hunts, new laws, surveillance techniques and the rest – meant that women's wages were suppressed even faster than men's. Here's the gender surplus at work. It was a crucial moment of primitive accumulation – and remained so in the cyclical restructuring of gender relations across the ensuing centuries.

Racialised surpluses were no less important. Drawing on a rich tradition of banking, war, and slaving in the Mediterranean, the Genoese and Iberians stumbled upon the epochal equivalent of killing two birds with one stone. From its origins on Madeira, to which we'll return in a moment, the twin inventions of cash-crop monoculture and modern slavery have continued to shape our lives five centuries later. Enslaved Africans on islands like Madeira and São Tomé were some of the first workers subjected to what Orlando Patterson calls "social death".[22] These workers were banished from Society. While slaves in pre-modern civilisations had always been outsiders, they still had rights. They were still enmeshed within reciprocal linkages.

Not so with the emergence of modern slavery, premised on the ideal proletarian: rightless and without a place in Civilisation. It was for sure a movement of social death, and also a savagely modern form of human sacrifice: of a quarter-million Africans shipped to northeastern Brazil after 1600, just 60,000 could be found in 1650. Of 2.2 million slave departures from Africa in the two centuries after 1492, just 300,000 Africans were living in the Americas by 1700. The carnage of the slave/sugar nexus would be unfathomable if subsequent holocausts were not there to remind us that mass extermination is the normal state of the Capitalocene.[23]

Early capitalism emerged through its frontiers near and far, in homes and families no less than across the oceans and continents. It would be

22 Patterson O (1982) *Slavery and social death*, Cambridge: Harvard University Press

23 Moore JW (2017) 'The Capitalocene, Part I'; and McBrien J (2016) 'Accumulating extinction', in *Anthropocene or Capitalocene?*, ed. Moore JW, 116–37, Oakland: PM Press

dangerous to think that capitalism in the twentieth century freed itself from frontiers of Cheap Nature. What is the coalmine or the oilfield, but a subterranean frontier?

> **"Imagined as a globe, the earth could 'become an object of appropriation for a collective humanity': for Society. Is it mere coincidence that our earliest surviving globe dates from 1492?"**

Every frontier movement, as we are seeing, is a movement not only to secure extra-human natures but also Cheap Labour. That means we do better to speak not of labour and nature, but of labour *in* nature and nature *in* labour. This is crucial to the kind of political ontology of work that is necessary if we are to reimagine the political challenges of the present around climate justice, around precarity, around all manner of economic justice.

EARLY CAPITALISM'S ENVIRONMENT-MAKING REVOLUTION

Early capitalism invented the global environment. This is true in at least three major ways. One is the transformation of a spherical conception of the earth into a global conception. That was no small thing, either practically or in the imagination. Imagined as a globe, the earth could "become an object of appropriation for a collective humanity": for Society.[24] Is it mere coincidence that our earliest surviving globe dates from 1492? If one could conquer the globe only once one imagined it, it's still the case that one needs practical tools for doing so: the modern map. So valuable were specific maps that they were in the sixteenth century "metaphorically and financially compared to the purchasing of the spices, pepper, silk and precious metals."[25] That process was complemented by the colonial networks of naturalists, who collected information about climate, flora, fauna, and anything else that was potentially valuable. By the middle of the eighteenth century – the timing is significant – there emerged a "global environmental sensibility" that included an awareness of the rapidity of environmental transformation in the tropical colonies.[26]

It was the scale, scope, and speed of environmental transformation, enabled by the cartographic and botanical revolutions, that demonstrates

24 Ingold T (1993) 'Globes and spheres', in *Environmentalism*, ed. K Milton, 31–42. New York: Routledge
25 Brotton J (1997) *Trading territories*, Ithaca: Cornell University Press
26 Grove RH (1995) *Green imperialism*, Cambridge: Cambridge University Press

early capitalism's use of Nature as a productive force. As I've mentioned, it was in Madeira, São Tomé, and then Brazil that we see the origins of the relationship between agriculture and slavery that would shape the world all the way to the twenty-first century. Madeira's accessible forests were mowed down so fast that it went from being the Atlantic's top sugar producer in 1510 to being virtually shut down just fifteen years later. When the sugar plantations reached São Tomé, deforestation proceeded at a furious pace. But this time the very scale of new sugar plantations – giant mill-plantation complexes, each with hundreds of slaves – worked against the masters. African slaves escaped to the interior of the island, and organised fierce resistance, laying siege to the island's capital for two weeks in 1596. Besieged on an island so close to Africa, the Portuguese quickly offshored their production to northeastern Brazil by the 1570s, where King Sugar would rule for centuries. But here again, deforestation, war, and the brutality of the labour regime would undermine profitability, and the sugar frontier once again moved. This time, sugar laid seige to the Caribbean, producing one biological wasteland after another in the century after 1650. The profits from this wave of the sugar frontier would be pivotal in the capital formation of late eighteenth century Britain. This was another reminder that industrialisation was propelled not only by class struggles at home, but also by the wretched fruits of a slave system that was as industrial as anything seen in nineteenth century Manchester. The surplus profits of "social death" continue to shape life and power and climate today.

This was far from a narrowly colonial story. Before Potosí's silver veins were opened, Central Europe's bled freely. In mountainous regions like the Erzgebirge, on the border between present-day Germany and the Czech Republic, there was a mining and metallurgical revolution without precedent in medieval Europe. The basic raw materials – copper and iron – and the indispensable metallic basis of sound money, silver, were produced here. Here are the extractivist origins of industrial capitalism – as industrial a process as any we would see until the late nineteenth century. Sprawling infrastructures – canals, roads, towns, and of course mines – were constructed virtually overnight. This extractivist revolution in the century after 1450 would culminate in the German Peasant War of 1525 – a revolt against the widespread destruction and enclosure of the forests and a proletarian insurrection all at once. Mining, as with sugar, would be forced outwards, to northern European and New World frontiers.

This was also a story of agricultural revolution in the emergent cores –

here as so often, the story begins not in England but elsewhere. In the Low Countries, medieval peasants had dug out so much peat that by the fourteenth century the region was literally sinking into the North Sea. The result, as Brenner reminds, was a process analogous to the "classic" instance of primitive accumulation in the English countryside: in both instances, cultivators were forced to sell to survive, to pursue labour productivity advance under competitive rents.[27] The result was a spectacular acceleration of proletarianisation and urbanisation. If one looks closely at the Dutch in the seventeenth century we can see virtually every major feature of large-scale industry credited to the English two centuries later. Production was increasingly mechanised, as in sawmilling; standardised parts were deployed in manufacturing, especially in shipbuilding; modern financial markets were developed, underscored by the formation of the Amsterdam Bourse in 1602. And it was all underwritten by an agricultural system that did what all capitalist agricultures must do: produce more and more food with less and less labour-time.

The Dutch fed themselves through an informal colonial relationship with the Baltic, whose modest grain surpluses underwrote the era's rapid proletarianisation and urbanisation. That agro-food metabolism exhausted the soils and bodies of serf cultivation in Poland, such that by 1700 England became the granary of northern Europe. But the English agricultural revolution, consolidated rapidly after Kett's defeat in 1549, was not immune to the metabolism of capitalist agriculture: after 1750 England's grain exports halted, and per capita food consumption actually declined in England over the next half-century.

Both Dutch and English capitalism had, moreover, depended on the extended Baltic for vital raw materials. A common expression in the seventeenth-century Dutch Republic was 'Amsterdam is Standing on Norway': at once a metaphor of semi-colonial dominance and a very literal description of Amsterdam, supported by timbers drawn from southern Norway. The global fleets of the Dutch and English were built with timber, tar, and pitch from a rolling forest-products frontier, beginning in the sixteenth century and not closing until well into the nineteenth century. The Baltic supplied not merely timber and shipbuilding supplies, but also potash from wood for bleaching – a demand that induced devastating deforestation from the Vistula to the western, then northern, Dvina as far north as Archangel.

27 Brenner R (2001) 'The Low Countries in the transition to capitalism', *Journal of Agrarian Change* 1, no. 2, 169–241

And if the old Nef thesis of English deforestation leading to coal has come under attack in recent years,[28] it's nevertheless firmly established that England produced no more iron in 1750 than it had in 1620 – Cheap Energy from England's forests had reached a historical limit. The growing margin of rising iron consumption in England – recall that about 15 per cent of English iron consumption was devoted exclusively to making horseshoes – came from Sweden. And even in Sweden, the forests were pushed back, with a new iron-producing region rising to preeminence every 25 years or so in the seventeenth and eighteenth centuries.

And if we are concerned with fossil fuels, let's remember that these too were an invention of the sixteenth century. People surely knew about coal, in England as in China, for a very long time. The Romans called coal Britain's "best stone."[29] It took specific relations of power, capital, and nature to turn these glorious stones – or in the case of peat, matted vegetation – into fossil fuels. We should not begin with coal, but rather with peat, the youngest of the fossil fuels, with about half the energy density of coal by weight. Indeed, Dutch capitalism was propelled by cheap peat and, after that, imported coal. Here was Cheap Energy for sure: extraordinary amounts of energy delivered with very low outlays of money and power. And like our other frontiers, peat extraction was subjected to the same dynamic of boom and bust that we've seen in mining, and sugar cultivation, and in the Baltic.

"The great problem of early capitalism was what Marx called underproduction, not as Malthus had it, but in the sense that the industrial dynamism of capitalism tended to outrun the raw materials sectors that could supply them cheaply"

All this provides a sense of the rapidity, and the scale and the scope of early capitalist transformation, which resembled the fundamental dynamics of later capitalism in nearly every respect. Early capitalism was, however, distinctive in its major form of economic crisis. The great problem of early capitalism was what Marx called underproduction, not as Malthus had it, but in the sense that the industrial dynamism of capitalism tended to outrun the raw materials sectors that could supply them cheaply.

28 Nef JU (1932) *The Rise of the British Coal Industry*, London: Routledge
29 Freese B (2003) *Coal: A Human History*, New York: Basic Books

Coal and then oil banished underproduction as a major problem. This was the epochal achievement of the long fossil boom. The active contradiction became one of selling the commodities that were produced, rather than securing the cheap raw materials that were necessary to produce them. And yet, Marx's "general law" of underproduction was not banished; the agencies of fossil capitalism merely counteracted the tendency. Today, skyrocketing extraction costs signal a likely return to early capitalism's central economic contradiction: underproduction.[30]

After 1750, this largely Dutch-led capitalism, enmeshed in all these different moments of environmental transformation, began to exhaust itself. Early capitalism's socio-ecological contradictions deepened and resistance to agrarian capitalism, from Russia to Peru, intensified. While this moment of 1750 is often celebrated as the dawn of capitalism, I'm not sure that's as useful as we want to think. The ability to move from using coal and peat as thermal energy to mechanical energy was huge. But this seems to have amplified – in a largely quantitative way – the dynamics and strategies of Cheap Nature established in the early modern centuries. One of the temptations has been to narrow the geography and the history of "the" Industrial Revolution to England and coal and the steam engine. No one of course denies that these are important dimensions of an important transition. But we should be cautious about giving too much analytical power to machines and resources, and about conceptualising these within a fairly narrow geographical or sociological compass.

For one thing, it's far from certain that the rotary steam engine after 1784 is even the most important technology of its era. One could readily argue that it was the cotton gin that enabled the steam engine's geohistorical impact. Invented in the 1780s and '90s, the new gin made possible a dramatic leap forward in labour productivity – removing seeds from cotton was an arduous task – and enabled the rapid spread of a fuzzy-seeded short staple cotton across the American South. It was a pivotal moment as well in the formation of a "second" and highly industrialized slavery across the Western Hemisphere.[31] With Marx, it was the fall in the price of cotton that made large-scale industry possible, and this cotton was cultivated by African slaves on lands that had been conquered from indigenous peoples, who were pushed out or exterminated. To put it in these terms completely re-frames our usual narrative of industrialisation… and of capitalism.

30 Moore JW (2015) *Capitalism in the Web of Life,* Verso
31 Tomich D (2004) 'Atlantic History and World Economy: concepts and constructions', *ProtoSociology,* 20, 102-121

NEOLIBERALISM AND THE EXHUASTION OF CHEAP NATURE: TOWARDS AN ECOLOGY OF HOPE

The crises of early capitalism were resolved through the combination of new technologies, new imperial and political forms, and new frontiers. Capitalism's secret sauce is that last moment. For the new frontiers opened, conquered, secured, and disciplined over the long nineteenth century set the stage both for the great boom of the post-World War II and the troubled history of capitalism in the neoliberal era.

There were two big problems for neoliberalism as it began to take shape out of the crises of the 1970s. One was that the sources of potentially Cheap Nature were fewer than ever before and the piles of money looking for profitable investment were bigger than ever before. This surplus capital problem was resolved through forms of frontier expansion that paled in comparison with the conquests of South Asia or the Americas or Africa in previous centuries, and also through varied movements of accumulation by dispossession.[32] Strikingly, the labour productivity revolution much anticipated in the 1970s – promising full automation and all the rest – never materialised. I've written elsewhere about this, so I just want to underscore how the relatively modest frontiers of the 1970s seemed to compel a return to the most savage forms of primitive accumulation and politically-enforced accumulation. I'm struck by the parallels between early capitalism's bloody expropriations and the stark realities illuminated by radical critiques of neoliberalism's doctrines, mass incarceration, and the "disposable third world woman worker".[33] But where early capitalism's violence established the conditions of vigorous accumulation, neoliberal violence has been more adept at accumulating misery than capital.

It's true that neoliberal capitalism did, in a way, restore Cheap Nature. Food prices fell, oil prices stabilised after 1983, labour costs were rolled back through capitalist class offensives across the world. What we saw in the neoliberal moment around agriculture, however, was something that we had never seen before - the attempt to re-establish capital accumulation on the basis of stagnant productivity. Agro-biotechnology and its toxic regime, after 1990 or so, has failed to restore agricultural productivity growth in the established cores of industrial agriculture in

32 Harvey D (2003) *The New Imperialism*, Oxford: Oxford University Press

33 See, for example, Klein N (2007) *The Shock Doctrine*, New York: Metropolitan Books and Wright MW (2006) *Disposable Women and Other Myths of Global Capitalism*, New York: Routledge; and Gilmore RW (2007) *Golden Gulag*, Berkeley: University of California Press.

Western Europe, in North American, in the Punjab. There is no more expressive contradiction of late capitalism's crisis: a steady deceleration of agricultural productivity growth is the law of value's most basic condition. It's not only that the capitalist agricultural model is broken and resisted. It's also that climate change renders both geographical and technical fixes to the agro-ecological crisis a dead letter.[34]

The second great problem faced by neoliberal capitalism is closely related, and has materialised strongly over the past decade. This is negative-value: the emergence of forms of nature, including social movements, that could no longer be resolved through the old productivist fixes. Negative-value comprises forms of life and politics that cannot be resolved through the old redistributionist strategies of capitalism, through the old strategy of thinking nature as a productivist resource.[35]

"There will be no effective politics of climate justice without putting agriculture at the centre"

Climate change – understood as a geohistorical event – is surely the greatest source of negative-value, and this mean we have to address the basic capitalist agricultural model at its core. There will be no effective politics of climate justice without putting agriculture at the centre. The OECD – hardly a bastion of radical thought - says that by 2035, agriculture will bear one third of the global economic damages arising from climate change. By 2060, this figure will have risen to two thirds.[36] Climate change is already suppressing the big four cereal crops of soya beans, rice, maize and wheat – between 1980 and 2005, David Lobell and his colleagues found that maize and wheat production were supressed by 3.8 per cent and 5.5 per cent.[37] Worse still, rising CO2 concentrations are reducing the protein, zinc and iron content of cereal crops at a moment when nutrient deficiencies already affect about three billion people.

The non-linear activation of negative value today not only represents a limit to capital in Marx's sense – a dialectical antagonism between capital's fantasy

34 Moore JW (2010) 'The End of the road? Agricultural revolutions in the capitalist world-ecology', 1450–2010, *Journal of Agrarian Change*, 10, no. 3, 389–413

35 Moore JW (2015) 'Cheap food and bad climate', *Critical Historical Studies* 2, no. 1: 1–43

36 Braconier H et al (2014) 'Policy Challenges for the Next 50 Years', OECD Economic Policy Paper No. 9, Paris: Organisation for Economic Cooperation and Development

37 Lobell DB, Schlenker W, Costa-Roberts J (2011) 'Climate trends and global crop production since 1980', *Science*, 333(6042), 616-620

of a perfectly interchangeable machine-like world and the web of life as an unruly and resistant mosaic of relationships – but also a clear threat to planetary life of every kind. The danger today is that global capital and the forces of empire will continue to behave as if negative value does not exist. Part of this response is to bury one's head in the sand. The bourgeoisie has its share of flat-earthers. Another part, and this may be even more deadly, is to behave as if the old strategies of genocide, privatisation, and enclosure will yield the same results. But they won't – climate as a geohistorical force is now not only drawing the curtains on any meaningfully new frontier of Cheap Nature; it is inverting the cost reducing mechanism of accumulation by appropriation. For climate change is, above all, costly – for capital, and for those of us who live under its rule.

MOVEMENTS OF INTERRELATED ECOLOGIES

In response, a family of movements has emerged that strive to connect particular moments of injustice with larger webs of power, capital, and nature. There movements represent a new ontological politics. A good example of this politics is food sovereignty, which says that the right of peoples to healthy and culturally appropriate food produced through ecologically sustainable methods necessitates new social relations free of oppression and exploitation. This is a concept of food that links it to power, justice and nature, all at the same time. I think this is a decisive political moment of a new ontological politics presenting demands that say: "we are not simply asking for more calories; we are saying that the right of food is about justice, the right to a liveable planet."[38]

This gives a sense of how the political economy and the political ecology of capitalism are wrapped up with each other and how they are wrapped up with and within the web of life. This is a part of what I and others are calling the world-ecology conversation.[39] This is important because it's fundamental to asking what is the common ground of a radical politics today? Does consumption give us what we need? Does sustainability give us what we need? I think there are probably many possibilities, but work is central. And work gives us a way to bring together radical politics that takes the dynamics of exploitation and oppression in paid work, the unpaid work of social reproduction and in the unpaid work of nature as a whole to find common ground.

38 Wittman HK et al, eds (2010) *Food Sovereignty*, Halifax, NS: Fernwood

39 See especially the articles and books collected on academia.edu (https://www.academia.edu/Documents/in/World-Ecology) and on the World-Ecology Research Network's website (https://worldecologynetwork.wordpress.com/new-world-ecology-articles-and-books/).

"emancipatory politics has to stop drawing lines around who's work and whose lives matter and whose do not"

I want to conclude on a few simple, but provocative, and hopefully generative, points.

First, emancipatory politics has to stop drawing lines around who's work and whose lives matter and whose do not. The worker is not only waged, but unwaged, not only human but extra-human.

Second, world-ecological thinking - that is to see that we are all embedded in the web of life and vice versa - can help us see whose lives and whose work are strategically located within capitalism's world-ecological contradictions. Simply being the most exploited or most oppressed doesn't make you strategically positioned to destabilise business as usual. What's crucial to our politics are analyses that show not just the severity of the problems – in the biosphere and in capitalism – but also how these shifting entanglements may provide opportunities for emancipatory politics.

And finally, we can and should make our slogan this: "No politics of nature without work and no politics of work without nature." The question of life and work can no longer be enclosed within Society. To quote Thomas Münzer, a central figure in the German Peasant War of 1525, "The creatures too must become free".

Jason W. Moore is an environmental historian and historical geographer at Binghamton University, where he is associate professor of sociology. He is author or editor, most recently, of *Capitalism in the Web of Life* **(Verso, 2015),** *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism* **(PM Press, 2016), and, with Raj Patel,** *A History of the World in Seven Cheap Things* **(University of California Press, 2017). He coordinates the World-Ecology Research Network. Many of his essays are available at jasonwmoore.com.**

This is an edited transcript of a lecture called 'World Accumulation and Planetary Life or Why Capitalism Will Not Survive Until the "Last Tree is Cut"', delivered on 10 October 2017 at an event jointly hosted by the Political Economy Research Centre at Goldsmiths, University of London and the Centre for the Understanding of Sustainable Prosperity at the University of Surrey.