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Reading Marx on ecology: “capitalism generates an unrepairable physical rift”

BARBARA HARRISS-WHITE discusses Kohei Saito’s book, Marx’s Eco-socialism: capital, nature and the unfinished critique of political economy *(Monthly Review Press, 2017). It is based on her talk at a panel at the Historical Materialism conference in London, on 8 November 2019 that reviewed the book, which won the 2018 Isaac Deutscher Memorial Prize*

Kohei Saito’s book shows us how Karl Marx evolved as an ecological thinker. It is a pioneering scrutiny of the evolution of ideas, the genealogy of terms, lines of debates and kinds of evidence, from the 1840s to about 1870. The book started as a German doctoral thesis, grounded in hitherto unpublished notebooks by Marx, but also drawing on Saito’s wide erudition. Putting paid to one set of debates, the book generates new ones.

1. Background and method

As a student of India’s development working in political economy and economic anthropology, I engaged with Marx as philosopher and political economist. Later, from the

Karl Marx as a young man

seminal contributions of John Bellamy Foster, Paul Burkett, James O'Connor and a new generation of colleagues, Marx emerged as an ecological theorist and methodologist and impossible to ignore. But before reading Saito's book, I never thought of Marx as an interpreter of the relevance of early soil science and agricultural chemistry for the study of capitalist development. I was aware, from my study of his treatment of merchant's capital, and my own students' explorations of Marx on petty production and on the middle classes, that Marx's analyses were context-dependent. Now Kohei Saito's book shows how Marx's understanding of capital evolved with the progress of science.

Saito's sources range far and wide. They include Japanese Marxist scholarship on labour and science notes in Marx's notebooks. Marx studied scholarly writing in Germany (Justus von Liebig (a scientist, considered the founder of organic chemistry), Carl Fraas (a botanist and agriculturalist)), Scotland (Adam Anderson (a physicist), James Johnston (a scientist)) America (Henry Charles Carey (an economist)) and beyond. Saito shows the development of important insights in 19th century science, which lack a "conscious" analysis of means and social relations of production. Integrating these is Marx's contribution.

Saito's own critique not only spans Marx's own ideas and notes from his readings, but also responses to critics of Marx, responses to critics of his sources, and debates between them. Saito brings historical evidence to bear from Marx's notes on desertification in Egypt and Greece; through the physics and chemistry of guano in Peru; soil depletion on US cotton slave estates; Irish and Indian famines; to the allocation of resources on Russian communes.

Saito's method is not without its critics. Andreas Malm has criticised Saito for his selective airbrushing of Marx's stance on the progressive nature of the forces of production under

Justus von Liebig

capital – his Promethianism.[1] T. Jayaraman argues that "metabolism" is not a dialectical concept for Saito, unlike "contradiction" which is surely the governing concept in Marx. Jayaraman also alleges that Saito's analysis is selective, omitting Marx's understanding of Charles Darwin, who demolished the concept of metabolism and replaced it by natural selection. Jayaraman argues that natural selection is a dialectical notion involving stable self-reproduction (and adaptation and mutation – *BHW*).

Now, just as there are no grounds for doubting Marx's ecological sensibility, Saito has made sure there are no grounds not to acknowledge Marx's retreat from an anti-ecological Promethianism. At the same time, Saito stresses Marx's non-apocalyptic position on ecological crises of capital, due in turn to his stress on the *diversity of material/metabolic processes*. These impose constraints on capital which capital can displace – though not infinitely.

2. A condensed summary of some of the argument

Exchanges with Nature: Metabolism

Saito lays out the dynamic *evolution of Marx's critique* from the time of Marx's 1844 *Economic and Philosophical Manuscripts*. He starts with the trans-historical relations of metabolic exchange
between *humans* and *nature.* (Marx writes: "This communism, as fully developed naturalism, equals humanism, and as fully developed humanism equals naturalism.") Marx develops the concept of metabolism to denote three kinds of exchange: those between humans and nature (which can develop contradictions); those between elements of society (also capable of developing contradictions); and those between elements in nature (natural laws of erosion, deposition, decomposition etc).

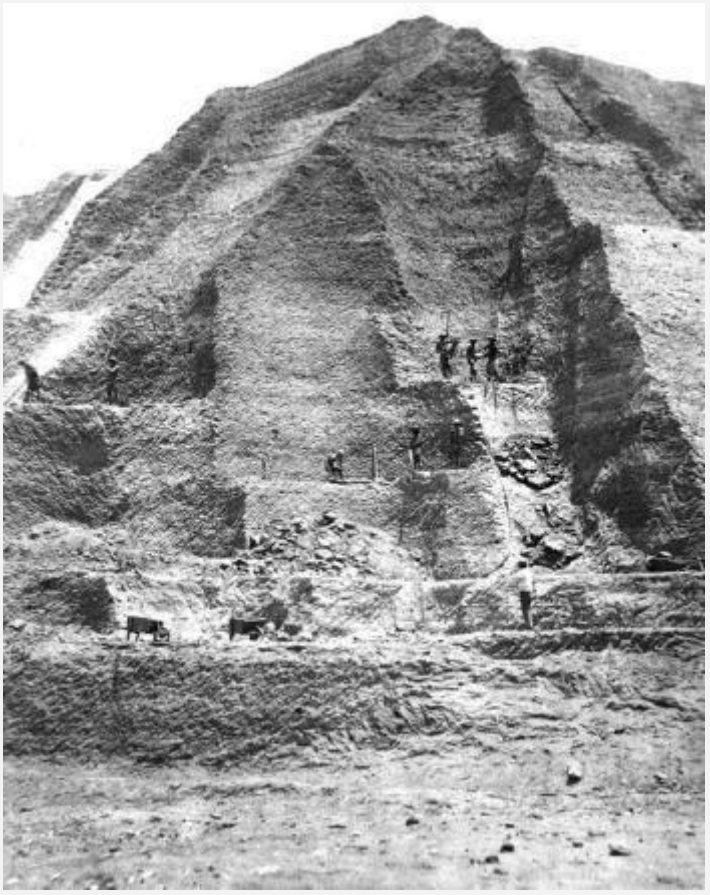
The concept of *unity* does not mean harmony, I think, but refers to sustainable relations between three trans-historical moments: humans modifying nature (for raw materials); humans transforming nature (for subsistence); humans returning waste to nature.

So the relations with nature as they are reified under capitalism – involving both quantitative expansion in forces and qualitative changes in social relations – are unprecedentedly and peculiarly destructive. (As in the much debated "robbery system" of Liebig and Carey, which

captured Marx's imagination). In the first instances, however, they destroy non-capitalist economic structures needed for the sustainable regulation of nature e.g. the recycling of human waste.

Agriculture as the paradigm

Saito finds *agriculture* as the paradigm of capitalism in Marx's notes, not factory industry. Since all methods involve some kind of selectivity, it's legitimate to ask whether Saito himself been selective, in drawing on the notebooks to stress agriculture. For Saito, Marx's ideas develop before1845 from a strictly philosophical standpoint to nature, through David Ricardo's economics of ground rent (and theories of *diminishing marginal returns* to land and to labour). Marx's notes move through the sciences of soil management and soil chemistry,



Workers in the 1860s excavate a "mountain" of guano more than 60 feet tall. Photograph © Smithsonian Institution

mineral and organic limits to productivity, following the evolution of Leibig's own scientific findings. These are vital to Marx theoretically, so as to contest the theory of diminishing returns and provide scientific grounds for socialist society not to be threatened by lack of subsistence. Limits on productivity or diminishing marginal returns are found in *nature*, and not only from the working out of the contradictions between forces and relations of production.

Marx is then shown studying the sciences of land management (rotations/fallow, irrigation/drainage, the application of energy to soil through mechanisation (Carey)), and what we now know as geomorphology (alluvial processes/erosion and deposition which humans alter (Anderson)). Onwards over time Marx moved on to the role of entirely natural processes replenishing fertility (weathering/minerals from space/the recomposition of waste from nature itself, processes whose pace does not synchronise with those of the cycles of capitalism), together with feedback interactions between biogeography and climate (the mutually constituting relations between forests and climate/forests as protectors of soil, plants and animals/deforestation and soil depletion/mountains as sanctuaries for biodiversity/the migration of plants etc (Fraas)).

Diminishing marginal returns in nature (or as a result of human-natural-human feedback relations) develop as an increasingly ambivalent notion for Marx, over the decades that Saito watches. They involve *multiple causes and "contradictory processes"* in a complex dialectic of destruction and replenishment.

Diminishing returns could occur under capitalism despite the application of energy, minerals and organic materials (as per Carey), *not* due to the lack of science and technology, but because science and technology were being developed to

serve capitalism – with accumulation working in the short term without a brake. Indeed the nature of the brake on commodification and competitive expansion is debated to this day: is it social, political,

Guano collection at Shark Bay, Australia. in the 1890s. Photo: Western Australia museum

technological, ecological? (T. Jayaraman has long warned us against a determined mechanical relation between science and the interests of capital. He allows for the relative autonomy of science, never constant, and thus for the possibility that science developed under capitalism may be useful in a transition to socialism.)

In the late period, Marx is seen by Saito researching primitive societies (e.g. Russian communes) *not* to suppose that a capitalist society would retreat to their level of technology/forces of production, but to examine two social processes: 1. How resources were sustainably and collectively controlled and organised and 2. How they resisted capitalism. Marx wanted to see soil as a place of resistance.

Capital, labour and nature

Saito traces Marx's evolving conclusions from 1844 onwards about the dynamics of capitalist expansion. In Saito's

interpretation, Marx argues historically that private property *results* from labour *already alienated* under feudal relations or in primitive accumulation (though later the relation between private property and the alienation of labour can be mutual) – that is, *alienated labour drives capitalism.*

Throughout the book, Marx's notes enable Saito's analysis to move between capital, labour (its "father") and nature (its "mother"). *Capitalism generates an unrepairable physical rift* just as it estranges and *objectifies labour*. Capitalist production relations exhaust both the soil and labour.

Labour is part of nature – since it lives in nature and depends on nature – but is alienated under capital. Labour loses the product of its work, its experience of freedom through work[2] and its residual freedom at the end of the working day. Capital attacks even the freedom of the reproductive sphere – all that is left are "animal functions".

The inner world of labour is impoverished, the body of labour is dehumanised by poverty and sickness, its poverty does not result from shortages but from exclusion and exploitation. Instrumentalised as a commodity, man is also alienated from man,[3] his knowledge of nature is destroyed. Labour is thus cut off from "species being" (a term from Feuerbach, meaning a species which knows it is a species and is rich in reflective capacities). According to Saito, although Marx drops this concept after 1845, when he turns from philosophy to study science and technology, he is always implicitly aware of the destruction of *human beings* as species beings, of threats to human capacity to reproduce, and the destructive reduction of species beings to commodified labour.[4]

Yet it is physical material limits – i.e. the contradiction between capitalism and its complex material base, rather

than contradictions between forces and relations of production – that will ultimately limit capitalism. The driving force of value shrivels as a mediator between humans and nature, instead becoming a goal of capital that is unobtainable without class exploitation.

Although capitalism cannot generally halt the drivers of self-valorisation, commodification and alienation, yet the process of value faces material limits manifested in diverse, specific, "non-linear" and historical ways. Unbalanced and ultimately limiting metabolic exchanges depend on the specificities of the division of labour and of nature.

3. Principles of ecosocialism

The title of Saito's book indicates ecosocialism as a major analytical and political objective of his project – but we learned at a discussion of the book[5] that the title is the publisher's rather than Saito's.

Calling their bluff, taking the title seriously, we can ask of the book how relevant to the current era is the act of reinterpreting 19th century ideas. In fact Marx's principles of ecosocialism are scattered throughout Saito's book, rather as ecological insights are scattered

Henry Charles Carey

in Marx. But, unlike the latter, Marx's ecosocialism does not evolve as we read. (The reader has the right to wonder

whether the lack of evolution of ideas about ecosocialism is in Marx or in Saito's treatment of Marx.) I try here in a summary way to bring Saito's unconsolidated references to ES together.

Moving towards ecosocialism (and not allowing for unintended consequences…)

Because of capital's elasticity, Saito's late Marx expects the motor of change to be ecological, rather than through economic crises. Nevertheless, Marx's ecosocialist politics are not uniquely ecological: the struggle is to change social practices to halt the power of private property and commodity production. The fight to improve conditions of work; to shorten the working day; to release/preserve time for the education of producers are parts of the preconditions for ecosocialism, just as they have been for non-ecological conceptions of socialism.

Consistent with the grounding of ecosocialism in agriculture and the productivity of soil, agrarian reform is a vital precondition to ecosocialism. As Marx wrote in a letter to Friedrich Engels: "Agricultural property is the alpha and omega of the coming revolution."[6]

Much more difficult – because only gained through revolution (which is hardly developed by Saito) – come a number of other dimensions of struggle. These include the abolition of wage labour – the emancipation of labour from illusion and from being a commodity – and also the de-commodification of the product of work and the abolition of the autonomous power of capital.

Many pathways to ecosocialism

Despite the importance of the historical context for the pathways to ecosocialism, Saito does not develop this insight. We must assume the notebooks don't either. There is

clearly room for a scholar/*activist* project recognising and distinguishing ecosocialism from below and ecosocialism from above.

Objectives of ecosocialism

Free and sustainable human development is the purpose of ecosocialism. But what did Marx mean by this? Saito's book makes clear that it's a project with several constituting elements.

Farmer spreading kraal manure (decomposing manure from cattle pens) on recently ploughed land, 2008, Hlokozi, KwaZulu-Natal. Photo: Alan Manson/Creative Commons

First, the careful use of science – perhaps, as Burkett enjoins us, to reconceive science as human science – *not* to transcend nature, but first to stop nature destroying society through humans-nature-humans feedbacks or through natural processes (post-glacial historical climate fluctuations, extreme events, etc). Second, to "restore unity" – restrain relations between humans and nature to ensure "more sustainable social metabolism", "conscious interaction".

Labour is to bring about "conscious de-alienation", "transcendence of reification".

These are highly abstract ideas for a book on history – but that is how Saito finds Marx's notebooks explaining the project. *Much more concrete* – is Marx's insistence on co-operation and collective action: "associated producers" … "participation in the public sphere"..."democratic government" … praxis/practice based on workers' experience, self affirmation with the external world, freedom through association. The "free development of individuals is a condition of the free development of all" and not of one class (capital) at the expense of the other (labour).

Resistance to capital is recognised to *need science* in order to be able to reject productivism and open up alternative production-distribution systems, collectively owned.

It is not that Marx wasn't elsewhere more specific than Saito credits him with here[7] – but the suggestive discussions outlined in the footnote are beyond the scope of Saito's project from the notebooks.

While the ends both transcend history and reflect the science of the time, the means have defeated human society so far.[8] The state of human-nature relations have changed so greatly since the mid 19th century that we face the imminent end of conditions for human survival.

4. Keys to contemporary problems

Saito leaves Marx in the 1870s+, in a position that both acknowledges physical constraints to relentless expansion of capitalism, and defends an analysis that is anti-catastrophist and anti-apocalyptic. Apart from enriching our understanding of its 19th century roots, how far does Saito contribute to contemporary debates about ecosocialism and agendas for ecosocialism, some 150 years after the period on which he

focusses, when a new politics of catastrophism is in development? We take as key messages into the future: (1) the ecological constraints on drivers of value under capitalism; (2) the specificity and contingency of destructive deformations of nature and of human development; and (3) the importance of the education of associated producers and role of science and technology in their education. (Although Marx didn't live with associated producers himself.)

Who are to be the educators to enable labour to recognise its "species being"? To his credit, Saito himself is one.

Contemporary conditions of nature and humanity: the inexorably widening metabolic rift

Notable planetary assessments, written in a fashion accessible to readers not steeped in science, include papers in *Nature* (here) and in *Science* (here and here) by the teams around Johan Rockstrom and Will Steffen. They conceive a safe operating biophysical space for humanity and describe what humanity is doing to wreck it. (These are part of a wider literature, which will not be covered here.)

Another body of research reveals the social relations of the widening metabolic rift. Daniel Hoornweg and his colleagues, in an article in *Nature*, show that waste is the fastest growing

Commodified livestock farming can deepen the metabolic rift

sector of many (developing) economies, expected to expand for a century before efficiencies in packaging and recycling are not overwhelmed by sheer growth in the by-products of production, distribution and consumption. Our research on India shows how public finance cannot cope with waste. Other work shows how the extraction of raw materials – at least in South Asia – is interlaced with criminal activity making a mockery of the legitimacy and developmental projects of states and democratic politics (See the Wild East: free pdf to download) . Jean and John Comaroff go so far as arguing that criminality is a global phenomenon of contemporary capitalism. (See here for *The Truth about Crime*: free pdf to download.) If so, the struggle against criminal capital must be factored into the pathways towards ecosocialism.

Xu Huijiao, in a forthcoming paper, looks at web of commercialised metabolic exchanges in northern China – finding them "multidirectional, interconnected, dynamic and uneven" (and music to Saito's ears). In this part of the world, social relations of agrarian capital incorporate a wide variety of tenurial arrangements, commercialised inputs plus

“backward”/“traditional” practices to preserve soil fertility (and yields).

Even confining the idea of “nature” to soil and its nutrient (organic/mineral) flows, and even reducing ecosocialism to metabolic repair (and political resistance), Xu finds that on-farm practices such as intercropping, the application of commodified livestock manure, fallows etc, have the net effect of doing the opposite – deepening the metabolic rift, instead of repairing it. (For Xu, as for Liebig, soil is a site of resistance not just land as the basis for revolutionary politics.)

Agriculture may be the paradigm but *nature is much more than soil* – more than biodiversity. There are constant debates about what nature is, about how materials, energy, organisms, waste and entropy are currently conceived in science and in public consciousness, and whether these definitions and conceptions are fit for purpose in the 21st century and/or adequate for ecosocialism.

Complexity.19th century natural sciences/sciences of nature were complicated enough as they evolved. Nonetheless there were no disciplinary Mexican walls as there are now. It was cognitively possible to keep in touch. It is another feat of Saito’s to have mastered science and social science, if only of the 19th century.

However the volume of science and social science now makes the mastery of all branches of transdisciplinarity impossible. Even the wide-ranging *new sciences of synthesis* are far removed from the much needed “dialectical science” called for after Saito’s Deutscher prize lecture in November 2019.

Some science of synthesis focuses on the dynamics of big polluters – as Simon Pirani does for fossil fuel energy. Similar systematic treatment is needed for Chemicals, Iron and Steel, Aluminium, Cement, Paper etc. Other science tries to

model ecosocialism – provisionally relabelled the Good Life for All. The Good Life project at Leeds university makes two further useful advances – despite results which only point to deepening rifts. First, it traces the destruction of biophysical thresholds for safe operation by each of 100 out of 196 countries. Second, it shows their progress towards human development. Only Vietnam has anything like a creditable record on both counts, with 6 out of 11 human development indicators achieved, while transgressing only 1 out of 7 environmental thresholds (CO2). Worldwide there is no existing model of Sustainable Development.[9]

Contemporary conditions of nature and humanity: Applying Saito's method of scrutiny to the present

So at least for those studying the present, Saito must be dynamised as an analytical perspective, just as he has done with Marx. This would involve a critique of science in order to help prepare the ground for science for ecosocialism. While it would take another book-length treatise to map and substantiate such a critique, hints of what might be involved include the following.

1. *The private ownership of science*. Much science is paid for, and enveloped, capitalist corporations or indirectly funded by them and paid for by consumers. Its results are shrouded in secrecy and there is hardly any point (yet) in drawing attention to the need to evaluate how its achievements might service the public interest or to the degree of autonomy in private science.
2. *The scope and ownership of public science*. Public science is mobilised a very wide range of funds and institutions. They include UN and intergovernmental agencies; civil society organisations not always with transparent funding; university consortia; learned societies, and an army of highly educated and highly paid members of ancillary/professional classes, who service and interpret

science for the non-profit complex.[10] Public science is mandated to address planetary problems and is evidently not a blunt tool of neoliberalism.

3. *Themes in public ecological science.* Sustainable development is at the heart of many transdisciplinary assessments, carving humans and nature into "people and planet", "nature, food climate and people", "millennium ecosystem services", "global warming of 1.5 degrees", "natural capital accounting", "sustainable development goals", etc. For this feat of public science to be possible, many potentially incompatible theoretical approaches have to be made consistent. Fuzzy concepts fill this role.
4. *Practices*. Modelling/scenario building is also deployed on a wide scale, sometimes assuming technology which does not exist (most famously in the IPCC's 2018 report on paths to limiting warming to 1.5 degrees), with impacts on scales that have hitherto been unmeasurable, and with results thematised through the effects of initial assumptions. Nature is either consensually assigned dollar values, and conceived only as the sum total of ecological services to humanity – or it is assumed to be able to be valued in this way.

Calls for stakeholders, for public participation, for plurality of thought and interdisciplinarity, and for leadership to reconcile competing perspectives, are made. Policy implications may not follow directly from the analysis (e.g. the epidemic of calls in 2019 to lift subsidies on agriculture (from scientific overviews of biodiversity and of the food system)). Unprecedented transformations, radical and even revolutionary changes are invoked for both governments and societies – always within the existing global capitalist system.

Analysis of the latter is conspicuous by its absence and its mention is taboo. At best it is paraphrased as "growth", "the

economy", "business", "markets". Political will is something lacking and to blame for procrastination in political action. Politics is ideology and to be avoided. With such practices, UN science demands sustainable development, while accentuating the metabolic rift. By neglecting capitalism, UN science cannot avoid serving private interests.

In sum. An approach influenced by Saito's reading of Marx would nail capitalism as a specific historical form, in which commodity production exploits humans, and in which nature will destroy society through the degradation of its habitat. Value creation cannot drive sustainable development nor work towards eco-socialism, because capital freeloads on labour and nature either to maintain surplus value or to maximise the quantity of profit.

Science is indispensable to ecosocialism. We see that UN/"public interest" science is *politicised through its very depoliticisation*, and that its effect will be to deepen the unmentionable metabolic rift under capitalism. Despite the relative autonomy from capital of some science, public science is not yet appropriate for the pathway towards ecosocialism. It is not clear whether it only lacks a historical materialist interpretation, as Saito shows Marx providing for some 19th century science, or whether the problem is more fundamental. I fear the latter.

Endorsing Saito's book, Bob Jessop encourages us to study it and not just to read it. He is right about that. I encourage everyone to study this carefully crafted and surprising book.

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economy; and on, the other, dimensions of deprivation caused by markets: notably under-nutrition, poverty, gender bias, health and disability, destitution and caste discrimination. She has a long term interest in agrarian change and rural-urban relations in southern India and currently researches the economy as a waste-producing system there. Her email is barbara.harriss-white[at]area.ox.ac.uk.

■ The ecosocialist views of Karl Marx. An interview with Kohei Saito

■ *Karl Marx's Ecosocialism by Kohei Saito (publisher's information)*

[1] Discussion at the Historical Materialism conference, London 8 November 2019

[2] Which we academics are supposed still to experience

[3] Saito's book is not gendered

[4] Nature persists as a vast complex micro-biome inside us. One new field of research will establish how the human micro-biome changes under the capitalism created by the human body

[5] At the Historical Materialism conference, 8 November 2019, mentioned previously

[6] K. Marx and F. Engels, *Collected Works*, vol. 38, p. 425, cited in Saito, *Karl Marx's Ecosocialism*, p. 186. Agrarian reform is politically inconceivable now without reform of industrial, service and financial assets

[7] See for instance Paul Burkett on sustainable human development, where he discusses the inevitable separation of humans and nature, despite humans having to work with nature to live. Science is needed to increase the productivity

of nature, not only *for the realm of necessity* but also *beyond* it. At the minimum, surplus stock is needed to cover environmental risk. Surplus time over "bread labour"/necessary labour time is needed for creativity, reflection, science, pleasures, the exercise of capabilities. Relations between the rural and urban (a contradiction?) and between agriculture and industry need reconceptualising. Burkett notes debates about decentralisation of industry to reduce the distance of exchanges of raw materials and waste from consumption of products – ecologically integrating agriculture and industry, rural and urban. Elmar Altvater adds from Marx the "remoralisation of resource allocation" through complex systems of social and non-market regulation of money and nature combining science and loving solidarity

[8] Not merely how to put a brake on capitalism, but also how to reconceive metabolism? This is a project of repair and restoration both to humans and nature. But to what kind of nature, when nature is now in dynamic flux? See my 2019 paper on ecological restitution in *Socialist Register 2020*

[9] Dan O'Neill at the Sustainability Research Institute at Leeds, in a recent interview, suggests 1. creating "reverse scenarios" to when biophysical thresholds were met s.t. adequate human development standards. 2. Investigating subnational achievements. 3. Developing models without luxury consumption, 4. modelling other possible impacts on planetary ecological subsystems and human development standards – colloquially known as "the doughnut" – of frontier dematerialisation. See an open access article here and an article by the research team in *Nature-Sustainability* here.

[10] See my essay, "Making the World a Better Place: Restoration and Restitution". This part of the present article is also informed by: an overview lecture by David Nabarro,

formerly special adviser to UN secretary general on food and nutrition, “Nature, food climate, and people” Oxford Martin School, on 31 October 2019; an Open Letter on 5th November 2019 signed by 11,000 scientists about World Climate Emergency; and the lecture on Biodiversity by Sir Bob Watson, at the Natural History Museum, Oxford, on 18 November 2019