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> ***We only know a single science, the study of history. One can look at history from two sides and divide it into the history of nature and the history of people. The two sides are, however, inseparable; the history of nature and the history of people are dependent on each other so long as people exist.*** Marx, 1845(1)

Few people today other than the coterie around Donald Trump and his appointed head of the US Environmental Protection Agency can doubt that humanity faces an environmental crisis. The rate of extinction of animal and plant species and the loss of natural ecosystems surpasses anything that has gone on in the past. The disruption of global biogeochemical cycles – manifest most critically in climate change — now poses a threat to human survival second only to that of nuclear war.

160 years ago, in London, as Marx was working on Capital, the physicist John Tyndall, experimenting on the heat-absorbing powers of carbon dioxide (and other gases), was the first to suggest what was later called the 'greenhouse effect'; the absorption of infra-red radiation by the Earth's atmosphere. Then, the concentration of atmospheric CO_2 (as measured subsequently by air trapped in ice cores) was around 286 parts per million. When the first direct measurements of global greenhouse gas were made in 1960 it was 315ppm. Today it is 412ppm – the highest ever since humans appeared on the planet. The effects — melting ice caps, sea level rise, desertification and extreme climatic events and their knock-on consequences for food production, biodiversity and our planetary ecosystem — are no longer a matter of conjecture. July 2019 was the hottest month ever recorded on earth. 'Tipping points' — patterns of self-accelerating destruction beyond which remedial action will be pointless, from thawing permafrost to degradation of rainforest — get ever closer. And, critically, despite huge advances in technology and productive capacity (not least in agriculture) millions of the world's people still go undernourished with inadequate access to water and the basic necessities of life.

Even the most conservative sceptics have been forced to pay lip service to a growing consensus that something is seriously wrong. Green parties, throughout Europe and beyond, are a significant political force even if not always influential in policy-making. All of this has happened during the period when human society has been dominated by capitalism – and the pace of environmental destruction is accelerating.

What follows is an attempt to sketch an answer to the questions: What can Marxism contribute to a theoretical understanding of today's environmental crisis? Is environmental degradation an inherent and inevitable feature of capitalism or is it is a consequence of 'growth' in general? Can and will socialism do any better — and what is the role of environmental movements in the struggle to achieve it?

Ecological alienation and the 'metabolic rift'

All living species change their environment in some way and most, arguably, leave some trace, however small, in the geological record. This was recognised well before Darwin and Marx; both of whom were aware of the enormous and generally irreversible impact of humans.

In his The Condition of the Working Class in England (written in 1845) Engels emphasised not just the low pay and appalling working and living conditions of working people, but the wider environmental degradation caused by industrial capitalism — as important to him as the conflict between factory-owner and worker over hours and wages. The Communist Manifesto, composed the following year, focused on the need to transform society for the benefit of people rather than profit. But as the views of the 29-year-old Marx and the 27-year-old Engels matured they progressively incorporated a growing awareness of human impacts on the natural environment and its interconnectedness. Charles Darwin's Origin of Species was published in 1859 and Haeckel coined the term 'ecology' in 1866. Although the analytical focus of Marx's Capital was economics, key passages assert fundamental environmental as well as economic contradictions within capitalism. Both Marx and Engels saw environmental degradation as not just a problem of the burgeoning industrial cities but a more general consequence of the alienation of humans from nature.

At that time systemic biogeochemical impacts of human activities were unknown, and their attention focused on specific issues to do with land management such as soil degradation and deforestation. Capitalist agriculture was a particular concern. Awareness of the consequences of monocropping - in nutrient depletion, soil destructuring and pest infestation - had informed the agricultural innovations which underpinned Britain's industrial revolution. With the intensification of farming, facilitated by inclosures, soil deterioration became in some areas a major problem, only partly addressed by a new trade in horse manure from the growing towns. Joseph Fison, John Lawes and other entrepreneurs made huge profits from the mining of mineral fertilisers. But the substitution of manures by inorganic fertiliser led to a reduction in soil organic matter (itself, together with the burning of fossil fuels, a significant contribution to atmospheric CO_2). In Volume 1 of Capital Marx declares that "[c]*apitalist production, therefore, develops technology, and the combining together of various processes into a social whole, only by sapping the original sources of all wealth — the soil and the labourer*."[(2)] Later, in writings assembled by Engels as Volume 3 of Capital, Marx writes of the moral imperative of environmental stewardship:

> *Even a whole society, a nation, or even all simultaneously existing societies together, are not the owners of the earth. They are only its keepers, its beneficiaries, and* […] *they must hand it down to succeeding generations in an improved condition.*[(3)]

Environmental contradictions raise questions about the complex dynamics of the relations of humans and of human society to nature; a project started by Engels in fragmentary essays collected together and later published as Dialectics of Nature. Engels wrote:

> *Let us not, however, flatter ourselves overmuch on account of our human conquest over nature. For each such conquest takes its revenge on us. Each of them, it is true, has in the first place the consequences on which we counted, but in the second and third places it has quite different, unforeseen effects which only too often cancel out the first.*

Engels saw this 'revenge' as something which predated capitalism; one of the main driving forces behind technological and social change and one that would be resolved with socialism. He concluded, optimistically:

> *Thus at every step we are reminded that we by no means rule over nature like a conqueror over a foreign people, like someone standing outside nature — but that we, with flesh, blood, and brain, belong to nature, and exist in its midst, and that all our mastery of it consists in the fact that we have the advantage over all other beings of being able to know and correctly apply its laws. And, in fact, with every day that passes we are learning to understand these laws more correctly, and getting to know both the more immediate and the more remote consequences of our interference with the traditional course of nature.*[4]

During and especially subsequent to the publication of Volume 1 of Capital both Marx and Engels became deeply interested in the dynamic of human-nature relations and of the ecological damage wrought by capitalism. Their theoretical understanding of the wider environmental consequences of capitalist production was informed by recent advances in physics (particularly thermodynamics) and chemistry as well as geology. For example, Sergei Podolinsky, a contemporary of Marx and Engels and an early pioneer of ecological energetics, set out to develop a synthesis of Marxism with the insights of Darwin and the laws of thermodynamics, developing a labour theory of value based on embodied energy.

Engels himself was critical of Podolinsky's attempt to *"find in natural science a new proof of the truth of socialism"* which, he said, *"confused physics and economics."*[5] Some anti-Marxists cite Engels' response as proof of a Marxist neglect of ecology. Burkett and Foster demonstrate however that Marx and Engels not only took Podolinsky's work seriously, but were in advance of it in several respects.[6, 7] *Engels, writing in 1882 to Marx (a few weeks before the latter's death) declared "As to what we have done in the way of squandering our reserves of energy, our coal, ore, forests, etc., you are better informed than I am."* He added, portentously, that what Podolinsky had forgotten *"is that within capitalism dependent on fossil fuels "the working individual is not only a stabiliser of present but also, and to a far greater extent a squanderer of past solar heat."*[5]

Marx's own research for Capital included a study of Justus Von Liebig's work on agricultural chemistry. Liebig pioneered the study of nutrient cycling and the role of chemical elements in plant growth (including the carbon cycle) but while promoting the manufacture of inorganic fertilizer he was also concerned about the depletion of soil organic matter and argued for the recycling of human sewage. Engels was particularly influenced by his close friend in Manchester, the 'Red Chemist' Carl Schorlemmer whose address he used to avoid police opening his letters.[8, 9] Schorlemmer (Marx nicknamed him Jollymeir because of his sense of humour) was one of the foremost organic chemists of his time and his influence, with Liebig and others, was almost certainly pivotal in Marx's concept of the 'metabolic rift'.[10]

'Metabolism' for Marx, signified the whole of nature and its interdependent processes of which humans were necessarily a part. He declared: *"Humans live from nature, i.e., nature is his body, and he must maintain a continuing dialogue with it if he is not to die. To say that man's physical and mental life is linked to nature simply means that nature is linked to itself, for man is a part of nature."*[11] *However, c*apitalism had severed that link, producing *"an irreparable rift in the interdependent process of the social metabolism, a metabolism prescribed by the natural laws of life itself."*[3][12]

Marx and Engels' work in turn influenced that of Vladimir Vernadsky, a pioneer of environmental science and one of the first to recognize that the oxygen, nitrogen and carbon dioxide in the Earth's atmosphere result from the activities of living organisms. His development of the biosphere concept (whereby earth processes are the product of interactions between living and non-living entities) and — along with the anarchist geographer Élisée Reclus and, later, the Jesuit geologist philosopher Pierre Teilhard de Chardin — of the idea of the 'noosphere' (whereby human consciousness comes in turn to have a determining planetary influence) prefigured many of today's ideas about human responsibility for the earth. Reclus's notion of humanity as '*nature becoming aware of itself*' can be critiqued as teleological but is nevertheless a powerful moral precursor of today's growing environmental consciousness.

A 'second contradiction' of capitalism?

Climate change is one of several categories of impact that are no longer localised; they are global – and permanent. Awareness of these impacts has led to the proposal that they should define a new geological epoch; the Anthropocene ('human-recent'). The start date is typically taken as the end of the Second World War and specifically the 'Trinity Test' of the first nuclear weapons by the US in 1945.[13] Some have challenged 'Anthropocene' as a vanilla term (presenting humanity as a homogenous unit and attributing impacts to our species in general rather than to capitalism as an economic system) and have suggested 'Capitalocene' —*"an ugly word for an ugly system"*[14] as more appropriate. It seems likely that the term Anthropocene will be in due course endorsed by the International Commission on Stratigraphy – making it official.

Rachel Carson's Silent Spring[15] was the first popular text to focus on the wider, systemic impacts of human activities including the accumulation of pesticide residues in terrestrial and marine ecosystems. When it first appeared in 1962 there was a tendency for some socialists to write off the environment as a 'middle-class' issue; a diversion from class struggle. However environmental limits and their consequences have always impacted most heavily on the poor. Environment is a class issue. But, like women's subordination, racism and a host of other issues it cannot be reduced solely to class. The relationship is a dialectical one.

Notwithstanding their insights, Marx and Engels could not have foreseen the extent of the environmental crisis today. Our growing understanding of human impact on the planet poses some profound questions for all socialists. A number of Marxists have pioneered approaches which have integrated economics with our growing understanding of the way the natural world functions. John Bellamy Foster and Paul Burkett have built on the ecological aspects of Marx and Engels' own work, arguing that it provides the basis for a truly green socialist theory.[16] And as awareness of the environmental damage caused by capitalism has grown, some have suggested that the relationship between capitalism and the environment should be seen as a 'second contradiction' of capitalism, a

contradiction of equal significance to that between capital and labour in analysing how capitalism reproduces and, ultimately, undermines itself. The journal Capitalism Nature Socialism, founded in 1988 by the Marxist economist James O'Connor, has, notably, promoted an 'ecological Marxist' theory which has major implications for the struggle for socialism.

The second contradiction thesis argues that environmental contradictions need to be seen as a driver of change alongside the class contradictions of an economic system based on profit. In terms of the dynamics of capitalist accumulation this is clearly the case. Marx and Engels saw energy as a key element in the development of industrial capitalism as the replacement of timber by coal – not just as a source of heat but as substitute for charcoal in the iron and steel industry — solved the problem of the 'timber famine' of the seventeenth and early eighteenth century. However the second contradiction thesis raises a number of issues. In the first place, capitalism has hitherto shown a remarkable capacity for overcoming 'natural limits'. From the replacement of wood by coal, to the progressive substitution of coal by oil, and most recently nuclear power and various types of renewable energy (all of them with their own inherent environmental, economic and social problems) these limits have been a major driver of technological change. And, as an economic system, capitalism has demonstrated that it is capable of surviving the most appalling environmental disasters.

Capitalism has always shown a remarkable ability to turn the environment – 'someone else's problem' into a profit opportunity. Friends of the Earth and Greenpeace were founded in 1971 – part of the tide of environmental activism that accompanied the peak of opposition to the Vietnam War a decade after Silent Spring. One of FoE's first campaigns was the 'bottle dump' of thousands of empties at the London HQ of Cadbury Schweppes, in response to Schweppes' decision to phase out deposit bottles in favour of (more profitable) non-returnable bottles.[(17)]

FoE won the media battle — it helped to establish FoE in the public mind as a campaigning organisation — but lost the war. Had FoE continued the campaign, the UK Government would almost certainly have conceded the central demand of re-use of bottles (via a statutory requirement for a deposit). Instead, FoE accepted the government's offer of a place on a new 'Waste Management Advisory Council' (WMAC) – dominated by senior managers of the worst industrial polluters, leavened and legitimised by tame representatives of community, trades union and environmental bodies.[(18)] Other members included the Chair and CEO of Reed Paper and Board Ltd; the President, British Reclamation Industries Confederation; the Assistant Managing Director of IMI Ltd and Past president of British Non Ferrous Metals Federation; the Managing Director, United Glass Ltd; the Vice-chair of Metal Box Ltd; the former administrative co-ordinator of BP Chemicals International and several local authority representatives.[(19)] The industry representatives managed to persuade the WMAC that the solution was not to reduce or to reuse what would otherwise be waste, but to 'recycle'.

Recycling, of course, shifted the burden to local authorities (and the ratepayer) and at the same time provided new opportunities for outsourced profit, much of it derived from dumping waste for landfill or incineration in low-income countries with lower environmental standards and labour protection. Importantly, it also let the manufacturers off the hook, shifting the focus of environmental responsibility to the individual consumer; 'acts of greenitude', a highly profitable corporate rhetoric that emphasizes the centrality of individual voluntary and virtuous acts. Only recently has this begun to be challenged with the revelation that much supposedly recyclable plastic

is not recycled at all but ends up as landfill or (worse) inside or encasing the bodies of marine animals. The result is that large UK retailers (belatedly; many other countries have for years required a returnable deposit on plastic as well as glass containers) are since October 2015, required by law to levy a charge on single-use carrier bags and some are slowly switching to paper or biodegradable containers for off-shelf products. But manufacturer opposition to returnable containers still prevails. How ironic that almost half a century on, environmental groups should now be campaigning for an all-in deposit return system on bottles and cans.

Overall, the voluntary approach to environmental sustainability has proved hugely effective in securing a cosy relationship between industry and government, sucking in sections of the left and the environmental movement as it does so. Radioactive waste remains probably still the single biggest threat, albeit one which is less in the news today, possibly because it is less suited to the 'I-issue' approach of the media. Private capital having made a mint out of nuclear power, the task of disposing of radioactive waste becomes the responsibility of the government's Radioactive Waste Management (RWM) charged with locating and commissioning a Geological Disposal Facility (GDF) for deep underground long-term (several centuries) storage of high-level waste. RWM is currently looking for suitable geological sites and 'willing communities' to build such a facility.[(20)] That cosy relationship is symbolised by the appointment of Lorraine Baldry OBE, Chair of the government's Radioactive Waste Management Advisory Council (charged with advising RWM) as Chair of Sellafield Ltd. Sellafield Ltd, like RWM is a wholly-owned subsidiary of the Nuclear Decommissioning Authority (NDA) – so that Baldry, while advising RWM on geological disposal, will also be running the company which stands most to benefit from that disposal – a clear conflict of interest. Baldry and is also, *inter alia* Chair of London & Continental Railways Ltd, Schroders Real Estate Investment Trust, Inventa Partners Ltd and of Tri-Air Developments Ltd. She was a Director of Thames Water until March 2019 and is also a Director of Circle Holdings plc and a Governor of The University of the Arts, London.[(21)]

'Ecosystem services' and the financialisation of nature

Fast-forward a half century from FoE's bottle dump and it is clear that the environment has become a source of capital accumulation beyond the wildest hopes of the industry representatives on the WMAC. Capital has moved from a strategy of denial, through subversion, to one of embracing 'solutions' as a new profit opportunity. Trading in carbon credits (essentially, permissions to pollute through emissions of greenhouse gases) is now one of the world's largest and most profitable international commodity (read: financial) markets, itself driving other technologies, from renewables to the currently fashionable focus on carbon capture and storage — a key element of the government's Clean Growth Industrial Strategy[(22)] and the latest and potentially very profitable technical 'fix' for a broken system.

CO_2 removal in operating power plants is often presented as the equivalent of taking a number of cars off the road. The Petra Nova coal-fuelled power station in Houston Texas claims 350,000 cars — to which a sane response might be 'why not take those cars off the road as well?' Even more ironically, the Petra Nova plant sends the CO_2 it 'saves', through over 100 km of pipes to the West Ranch oilfield where it is used to pump more oil (raising production from 300 to 4,000 barrels per day) – to fuel the cars whose emissions it hasn't replaced.[(23)] And the introduction of electric cars is no solution. Leaving aside the question of how the electricity is generated, existing reserves of cobalt (most of it currently mined in the Democratic Republic of Congo dominated by a

handful of mining companies such as Glencore using child and forced labour) are way too low to produce storage batteries for all the cars currently in existence — of which less than one in five are in use at any moment.

Following the publication of Capital, Marx himself had several times to challenge dogmatic interpretations of the labour theory of value, declaring (for example) that *"Labour is not the source of all wealth. Nature is just as much the source of use-values (and what else is material wealth?) as labour, which is itself only the expression of a natural power, human labour power."*[24] What Marx and Engels did aver, however, is that only human labour could be the source of new value. Even here Marx had earlier emphasised that there were things like 'wild' land (Marx added conscience and honour) that could have a price but no embodied labour value: *"Objects that in themselves are not commodities* […] *are capable of being offered for sale by their holders, and of thus acquiring, through their price, the form of commodities. Hence an object may have a price without having value.* […] *for instance, the price of uncultivated land, which is without value, because no human labour has been incorporated in it."*[2]

Were he writing today Marx would undoubtedly have chosen the commodification of the atmosphere through carbon credits as his 'natural' example. Carbon trading is just one aspect of financialisation which treats nature as a commodity, applying an exchange value to 'wild' processes and ecosystems notwithstanding the fact that there is no labour content involved.[25] It manifests itself in peculiar ways. In August 2019 'Sir' Elton John (lionised as a pillar of society on the Royal Mail's September stamp issue) defended flying the Duke and Duchess of Sussex (Harry Windsor and Meghan Markle to you and me) in his private jets, saying he had paid to 'carbon offset' their trip.[26] December's COP25 in Madrid (27,000 delegates, observers and journalists, most of whom travelled by air) was intended to progress the2015 Paris Agreement (from which the US under Trump, has withdrawn). It ended in disarray and global emissions continue to increase.

Carbon trading is an extraordinary source of what Marx called 'fictitious capital' – but a source which would have been inconceivable in Marx's time. If history teaches us anything, it is that under capitalism the forces of production are dynamic and constantly changing, but the essential exploitative relations of production remain and can indeed be reinforced. It is entirely possible that 'fossil capitalism'[9] could be superseded by a notionally greener version but with its exploitative structures intact. A host of related practices such as biodiversity offsetting and habitat banking (now fundamental to the UK planning system) reflect the commodification, the monetisation of nature, underpinned by new theoretical approaches such as natural capital and ecosystem services, often promoted as somehow challenging 'orthodox' economics (but in reality supporting it), all putting a price on nature and natural processes so that they can be integrated with the capitalist marketplace.

The environment has become big business. In the UK the Green Investment Bank (GIB) was set up in 2012 with £3.8 billion of government (i.e. our) money, to fund green infrastructure projects including off-shore windfarms and other renewable energy and low-carbon schemes. In April 2017 it was sold off for just £2.3 billion to the notorious Australian tax-dodging Macquarie Bank, adding to the Bank's 'green portfolio' of £6.7 billion equity (which brings in 70% its profits) in this area alone. Free of public-sector restrictions the Bank can do what it likes with its investments; these already include fracking.

As all political parties pay lip-service, at least, to the perils of climate change (though target dates for a carbon-neutral economy differ) big business is lining up for yet another profitable bonanza subsidised from public funds. The (privately owned) Drax generating station in Selby, North Yorkshire was once one of Europe's biggest polluters. Now converting (at a public subsidy of £2m per day) from coal to 'renewable' wood pellets (imported from the US), it is lobbying for yet greater public funding to capture its carbon emissions and store them underground.[27] Environmentalists have criticised the dodgy 'carbon accounting' of the project which could lead to further deforestation and ignores the risks associated with carbon capture and storage.

There is a danger in overemphasising 'natural' limits at the expense of a focus on the internal contradictions in capitalism that force 'growth' of the most environmentally destructive but profitable kind. As David Harvey declares, *"The capitalist class, it goes without saying, is always delighted, on this point at least, to have its role displaced and masked by an environmental rhetoric that lets them off the hook as the progenitors of the problem."*[28] Especially after the defeats of labour and socialist movements of the 1970s, capitalism's environmental contradictions became more prominent and for some, appeared to present a stronger basis for building anti-capitalist alliances than labour struggles. The alliances that can be built around environmental issues are critical. However it remains the case that environmental destruction is to a great extent driven by the fundamental contradiction in capitalism - between the forces and relations of production.

In this context a Marxist, class approach can also illuminate more generic, seemingly intractable aspects of the environmental crisis.[29] Following Silent Spring, Garrett Hardin's essay 'The Tragedy of the Commons'[30] codified in global terms what is today the most prevalent argument for the 'waste' of social property and the privatisation of what were previously public environmental goods. Texts like Paul Ehrlich's The Population Bomb[31] argued (as Thomas Malthus had, more than a century and a half earlier) that poverty and starvation was 'nature's way' of keeping the population down. In parallel the 'Club of Rome' (an 'invisible college' of policy makers funded by a consortium of second-rank multinationals) declared that 'growth' (of all types) was unsustainable and produced a computer model to 'prove' it.[32] All fed in to public policy, not least the (ineffectual) mass sterilisation campaigns of the 1970s in India and elsewhere.

In response, Chris Freeman and colleagues at Sussex University's Science Policy Research Unit showed that the issue was not 'growth' or 'no-growth' but what kind of growth, where, in whose interests and controlled by whom.[33] And specifically in the context of population growth, the Marxist environmentalist Barry Commoner pointed out that the global 'population explosion' of the last century was specifically a consequence of imperialism and of capitalism's continued neo-colonial exploitation; and that the 'developed' nations — many of whose 'natural' populations (i.e. excluding immigration and emigration) are declining — had achieved their own demographic transition on the backs of the so-called 'third world' – a form of demographic parasitism.[34]

There is not a single 'human ecology' – every social system has its own ecological dynamic, and capitalism's is a particularly destructive one.

Alliances in the struggle for socialism

From FOE's bottle dump to plastic pollution, biodiversity loss and climate change – to the population 'explosion' and 'growth' in general, it is clear that just as capitalism, as an economic

system, depends on exploiting workers, so too it relies on exploiting the resources – living and non-living – of our world. The environmental crisis and the degradation of nature is the flip side of increasing inequality and the impoverishment of people. Both are the physical manifestation of m*ultiple alienations under capitalism* — people's alienation from their labour, from each other, and from the natural world. Non-exploitative capitalism is a contradiction in terms.

This is something increasingly recognised, albeit tacitly within the various overlapping movements on the environment. Extinction Rebellion (XR) and the equally impressive school student climate strikes have dramatized for a new generation the enormity of the threat posed by climate change — the tip of the melting iceberg of capitalism's environmental crisis.

On the surface, demonstrators are asking for something very simple: formal acknowledgment that a climate emergency exists and real action to tackle it. Underlying the demonstrations is something even more important – a recognition that climate change isn't something incidental that can be tackled with simple fixes, but intrinsic to a broken system. In short, there's an anti-capitalist element (at least) to the growing movement on climate change. As activist Greta Thunberg declared to Westminster MPs, without change, young people *"probably don't even have a future any more. That future has been sold so that a small number of people can make unimaginable amounts of money. It was stolen from us every time you said 'the sky is the limit*." Jeremy Corbyn welcomed Thunberg's visit to Parliament, saying *"Young people will be the most affected by climate change – seeing them take charge of their future is inspiring."*[35] By contrast London Mayor Sadiq Khan after a perfunctory assurance that he shares the XR protesters' *"passion about tackling climate change"* went on to declare *"you must now let London return to business as usual."*[36]

'Business as usual' of course is precisely what has brought about the crisis. The cultural significance of XR and the school strikes (if you like, their 'revolutionary' potential) is a matter for debate but at the very least they offer an antidote to the tame posturing of Tory politicians and the liberal hand-wringing of television programmes (including, for this author, those narrated by David Attenborough). Without a formal manifesto or any theoretical elaboration activists have already targeted the physical manifestations of capitalism (from Heathrow Airport to the Stock Exchange) in a way analogous to the direct action against the obscene DSEI London arms fair and earlier movements against the threat (arguably today even greater than climate change) of nuclear war. In this context, Extinction Rebellion and student climate strikes are – alongside the renewal of left politics in Britain — hopeful signs that change is possible. And – just as the Governor of the Bank of England (no less) observed that as the economic crisis deepens, the works of *"Marx and Engels may again become relevant"*[37] so increasing numbers of people perceive that Marxism has something to say about the environmental crisis – and about the climate emergency in particular.

O'Connor suggests that if the struggle for the environment is as important as – for many perhaps even more important than — class struggle: *"there may be not one but two paths to socialism in late capitalist society"*[38] - the class struggle focused on economic and political exploitation and struggles focused on the environment. For Marxists, those wider struggles – in our communities, to protect the environment, at the point of consumption as well as of production – are critically important; they cannot simply be subordinated to class struggle. Far from class politics having been superseded, to be replaced by 'middle-class' ideological radicalism, campaigns are increasingly linked (and have the potential to be more so) to economic struggles and to broader-

based campaigns for equality and environmental justice. Interviews with over 20,000 demonstrators suggest that there is significant overlap and that environmental activists are likely to be engaged in more formal forms of political activity.[39] At the same time, the lack of a clear political dimension to environmental activism is a major handicap, illustrated by the significant loss of public support – and consequent divisions within XR - when London activists climbed on top of London trains in October 2019, bringing the Jubilee Line and the Docklands Light Railway – green modes of transport — to a halt at the height of the morning rush hour.

Just as environmental activism doesn't automatically lead to class awareness and socialist consciousness, so socialism is not an automatic solution to the environmental crisis. But it is an essential prerequisite for any long-term resolution. Marx declared that Communism *"is the definitive resolution of the antagonism between humans and nature and between humans and humans* […] *between existence and essence* […] *between freedom and necessity, between individual and species."*[11] But he understood, as Marxists today understand, that we cannot wait for such a theoretical, literally 'utopian' solution. Capitalism's economic and environmental crisis is upon us, now. Following Labour's defeat in the 2019 elections it is clear that progress towards a green socialist future requires a much broader left movement, rooted in the labour and trades union movement, in local communities and in the wider popular concern for the environment. Like other proposals for a 'green and just transition' from the TUC[40] to environmental NGOs such as the World-Wide Fund for Nature,[41] the Labour Party's 2019 Manifesto proposals for a 'Green Industrial Revolution'[42] – a version of the 'Green New Deal' promoted by European left and green parties in response to the financial crisis — emphasises environmental sustainability alongside equality and social justice. It falls well short of a fully socialist programme but would nevertheless have been bitterly contested by the beneficiaries of power and profit whose interests it challenges. Following Labour's defeat it is important that it remains the focus of debate and campaigning.

The relation between capitalism, socialism and the environment is by no means settled and is (along with many other topics) a developing area of Marxist theory and practice. It is one with which we can all engage. In the meantime just like austerity (capitalism's 'solution' to its economic crisis) capitalism's onslaught on the environment – from global climate change through drought and desertification (as last summer's heat wave demonstrated, not just in the 'developing' world) to traffic pollution and the loss of urban green space in our cities – bears disproportionately on 'the many', impoverishes us all, threatens to destroy our planet, and makes the struggle for a sustainable, green, socialist alternative all the more urgent.

Notes

Unless indicated otherwise, all on-line sources were last accessed on 17 January 2020

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