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Editorial introduction

David Samways – Editor

The previous issue of the JP&S (Vol.4 No.2) was published in the midst of the COVID-19 pandemic and as I write, although hope in the form of vaccines is on the horizon, the disruption and the costs to welfare (in the broadest sense) still appear to be far from drawing to an end. This issue of the JP&S could have been titled as a 'partial special issue' since of the six articles three are directly concerned with the pandemic, the lessons that can be drawn from it, and the opportunity for change that it may present. To some extent all the papers presented here touch upon issues concerning our relationship with the natural world which the COVID-19 pandemic has brought to the fore, such as the potential tension between liberal conceptions of individual freedom and collective welfare, the need for change in our socio-economic system and a need to reassess our vulnerability to natural forces that once were thought to be potentially within our control.

The idea of transcending nature and bringing it under human control is a theme familiar to scholars of the Enlightenment. The burgeoning science and technology of the modern era and the production of ever greater surpluses appeared to many thinkers to be removing humankind from the capricious forces of nature and offered the hope of a new kind of freedom. For many, this sentiment reached its apogee with this much quoted sentence from Marx's Capital Volume III.

> Freedom in this field [material existence] can only consist in socialised man, the associated producers, rationally regulating their interchange with Nature, bringing it under their common control, instead of being ruled by it as by the blind forces of Nature; (Marx, 1959 [1894] p.820)

This "Prometheanism" was considered a pernicious perspective by the founding figures of the contemporary environmental movement. Rachel Carson (1962) wrote:

> The 'control of nature' is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man (p.297).

The COVID-19 pandemic reminds us of the power of natural forces: while we can frequently find technical solutions – in this case a vaccine – our technical "mastery" of nature is far from complete. As William Rees' article makes plain, population growth and density are critical vulnerabilities for any species. Rees, the co-developer of the ecological footprint concept, argues that the COVID-19 pandemic should be seen as one of the negative feedbacks consequent of our outsized footprint of which human population expansion is critical dimension. Rees takes us through a number of examples of how in nature the positive feedback of reproduction in favourable environmental conditions leads to population growth which is eventually checked by the negative feedback of the exhaustion of some fixed resource or environmental change due to population growth. Indeed, the SARS-CoV-2 virus itself demonstrates the biological principles behind any species' population growth in conditions of resource abundance (non-resistant humans).

Rees also points out that growth in population densities beyond certain levels lead to conditions in which populations are more vulnerable to predators, which of course can include micro-organisms like the SARS-CoV-2 virus. All density-dependant species, that is those which are subject to negative feedback due to their own expanding numbers, are involved in these push-pull dynamics where numbers fluctuate up and down depending on environmental conditions around an unstable equilibrium. In nature, Rees argues, from the smallest to the largest, all organisms exhibit a "fractal geometry" in that the patterning of population dynamics differ only in temporal and spatial scale.

In the case of our own species, it is only recently (in species history terms) that our population has exponentially grown beyond the boundaries that in pre-industrial times would have corrected it to the environmental 'carrying capacity'. Fossil fuels have been pivotal in this and allowed the ecological footprint of individuals as well as entire populations to grow. While only a fraction of the global population has until now been responsible for the vast majority of environmental degradation, the growth in consumption and populations of low and middle income countries is the present driver of humanity's expanding footprint. As Rees observes, "the

world community must confront egregious inequality and population growth as separate problems".

However, nothing can continue to grow for ever and we are now beginning to directly experience the boundaries of the ecosystem as negative feedbacks such as COVID-19 and climate change show their teeth. Rees points out that all species are ultimately subject to checks on population growth beyond carrying capacity. That human population will adjust back to a carrying capacity Rees is certain, the question is whether it is a consequence of highly unpleasant natural forces or our collective restraint on resource consumption and management toward a sustainable population.

As argued in papers in this issue and in our special issue on economic growth (Vol. 3, No. 1), this management will need to be part of a larger transformation of our social and economic systems. Marxist thinkers have frequently been the most vociferous in their claims that capitalism is economically and socially unsustainable, yet a faith in human ingenuity and the technical transcendence of natural boundaries has led the majority to a dismiss population growth as a problem. As Julian Roche argues in his paper in this issue, "Marx, population and freedom", even when Marxists have embraced ecological concerns and drawn out 'ecological' themes in Marx's writing, few have critically engaged with Marx's antipathy to Malthus regarding population growth and natural limits. Indeed, Marxists have traditionally regarded those concerned about population growth with suspicion as it has been seen as an inevitable result of capital accumulation and the social problems associated with it, such as poverty, the result of capitalist relations of production and hence distributional in nature. Moreover, Marxists have tended to subscribe to a technological optimism whereby natural limits are continuously transcended.

However, Roche notes that even when Marxist ecologists have acknowledged natural limits, the issue of population growth has largely remained unaddressed with most focussing on overconsumption in the Global North. This has tended to go hand-in-hand with a liberal human rights-based stance rejecting state interference in individual fertility decisions coupled with a reliance on the observance of demographic transition and the argument that fairer resource distribution will lead to fertility reductions as incomes rise. However, Roche points

out that notwithstanding the empirically problematic nature of Marxist arguments regarding population growth, there is a basic incompatibility between liberal individual freedom and Marx's own conception of individual freedom as social, collective and positive. Roche argues that the achievement of the this unalienated freedom requires not only the transcendence of capitalist social relations, but given the acceptance of natural limits, the active transition to a smaller global population.

The COVID-19 pandemic certainly demonstrates how liberal conceptions of individual freedom are unequal to dealing with such crises. In the same vein discretionary individual responses to the environmental crisis more generally will be inadequate and changes at the social systemic level will be needed. However, the COVID-19 pandemic may well increase public concern for the environment and increase receptiveness to social systemic change.

Although it is notoriously difficult to measure public attitudes to environmental issues, prior to the pandemic in the UK there was a noticeable shift in public environmental concern, especially regarding climate change. Indeed, environmental concern was at the highest level ever recorded (Smith, 2019). However, for the majority of people concerns about relatively remote existential threats such as climate change are not foremost in their everyday consciousness. The social and physical/technical structures of everyday life (the economic system, social institutions, transport systems, energy systems etc.) mean that not only is the ability to act externally constrained but also that the habitual aspects of life from food preferences to habits of personal hygiene and comfort make changes in behaviour hard to achieve. Frequently the conditions of action are such that we have no knowledge of the potential impact of a particular action. But even when levels of environmental consciousness and behaviour are high what have become the normal expectations of life can trump these concerns, meaning that we knowingly engage in environmentally damaging actions (Alcock et al., 2017). Such behaviour is partly attributable to the problem of collective action (the personal cost of cessation is high and the environmental benefits negligible if others continue), but it also stems from our ability to simultaneously hold multiple, often incompatible and contradictory, values and act on each depending on the situation. This is not some simplistic unthinking selfishness, but a hierarchical ordering and rationalising of purposes and concerns (see Giddens 1984) in a given social context.

It is also clear that where individuals perceive the threat to be more immediate, personal and immanent – or, more powerfully still, if they have direct experience of the consequences – then they are more likely to take action or change their behaviour. A number of studies show that local and short-term environmental issues such as water and air quality are ranked as of great concern (IPSOS, 2018; McCarthy, 2019). Moreover, personal experience of a phenomena connected to a global longer-term environmental issue can have a significant positive effect on the likelihood of engaging with the issue and changing personal behaviour (Spence et al., 2011; Broomell et al., 2015; Demski et al., 2017). Indeed, the more emotionally resonant the possible consequences of action are, the more likely we are to change our behaviour. A recent paper (Schneider-Mayerson and Leong, 2020) suggests that for those aware of the issues, the most intimate and personal decision of whether to have a child is more informed by concern about the wellbeing of the potential child than concerns about the environmental impact of their offspring.

Thus, the majority of our environmental impact emanates from the habitual everyday stuff in which we are engaged, which is inextricably embedded in the social systemic context. It follows that while individual environmental consciousness and choices are important, without system change those decisions will be largely impotent. As Graeme Maxton notes in his article published here, a transition to a sustainable society...

> ...will not come about simply by encouraging people to treat the world around them with greater respect. The imperative to endlessly increase economic output makes that impossible, even before patterns of individual behaviour and the rising human population's need for more land are taken into account. To work, the change in human behaviour needs to be fundamental.

Personal experience of the COVID-19 crisis may come to represent just how disruptive to the taken-for-granted sense of ontological or psychological security anthropogenic environmental disruption can be and may represent a starting point for articulating the need for radical social and economic change.

Like Rees, Maxton sees the COVID-19 pandemic as one of a number of indicators of humanity's unsustainable encroachment on the natural world as a consequence of

our economic and population growth. Maxton points to a whole range of impacts and their consequences for humanity including exposure to novel pathogens and ecosystem disruption leading to species extinctions but singles out climate change as the most pressing and immediate risk. While acknowledging the enormous social and personal cost of the pandemic, Maxton sees it as an opportunity to reset economic policy and for governments around the world to shift to a new economic system. The pandemic has forced governments to make drastic restrictions on normal social and economic behaviour, and this has had great short-term and potentially long-term environmental benefits. Importantly, this interruption and reversal of fossil-fuelled economic growth has shown that it is possible to cut carbon emissions. But perhaps most significantly, the pandemic has shown the level of investment required to tackle climate change. Maxton argues that the current economic crisis should not be seen as a problem but an opportunity. Governments should abandon the idea of returning economies to their previous size and permanently downsize them while building a system which can live within natural boundaries. To this end, governments should pay a basic income during the transition and support the new economic sectors required to address climate change. To pay for this governments should print money, and while this may lead to economic problems, Maxton is clear that such problems are easier and less costly to deal with than the run-away climate change which will indiscriminately force change upon us. COVID-19, Maxton argues, presents the opportunity to choose our fate.

Doug Booth also believes that the COVID-19 pandemic offers an opportunity to change economic direction. In "Achieving a Post-growth Green Economy" Booth blends what he calls the "post-materialist silent revolution" and the idea of a "post-growth green economy" and offers it as a framework to consider our economic and environmental future. The post-materialism thesis is based upon the research from the World Values Surveys which shows a significant increase in the number of middle-class youths who are significantly less interested in material wealth and possessions than previous generations and who also subscribe to values of freedom of expression and social tolerance and are more likely to live in high density urban environments. These factors, Booth argues, mean that, overall, the lifetime resource consumption of post-materialists is reduced.

Such changes in individual preferences and culture clearly represent a starting point for the establishment of a more sustainable society but need to be accompanied

by overall change in social and economic structures. Importantly, Booth argues that post-materialists represent a political constituency to support a post-growth green economy founded on the principle that energy flows and wastes should be capped at levels which are ecologically sustainable. Booth points out that societies at the upper end of the development scale are already experiencing declining rates of growth. Importantly population growth in developed societies has slowed to very low levels and will soon be negative while economic growth has slowed to approaching 1% of GDP. Indeed, Japan has a population growth rate of zero and a GDP growth of 0.8%. A post-COVID-19 green new deal, although stimulating short-term economic growth, could decarbonise developed-world economies, while assistance to developing nations to grow and improve welfare while also simultaneously reducing their carbon footprint could be financed by the developed world at modest cost. Such development, Booth notes, would also have the added benefit of accelerating the decline of fertility rates.

All of the above papers acknowledge that a transition to a greatly reduced human population is necessary to achieve long-term environmental sustainability, but what is that level of population? Christopher Tucker argues in his book, *A Planet of 3 Billion* (2019), that a global population of 3 billion would be compatible with high welfare and environmental sustainability. In the commentary piece published here, he poses the question of how the already declining rate of population growth might be accelerated to achieve such a population well before the UN and other models predict. Tucker begins with the observation that all the data shows that we currently live well beyond the planet's sustainable capacity which has led to an ecological debt that will take generations to repay if we manage to avoid the collapse of our civilisation. In contrast to this, Tucker, like Rees, notes that for the majority of our species history humankind has had a population that has only seen very slow rates of increase as fertility barely exceeded replacement. However, the advent of what we now call modernity led to massive and relatively rapid improvements in infant and maternal mortality rates while decreases in fertility lagged behind. The resulting acceleration in population growth, stabilisation and now the beginnings of decline in the Global North is the core of the demographic transition theory that will be familiar to readers of this journal.

Tucker sets out his argument elsewhere for why a sustainable global population is around 3 billion; here he asks what is required to bend the population curve from

the UN's median projection of nearly 11 billion by 2100 toward this sustainable number. Tucker notes that Vollset et al (2020) question the UN modelling and project that average global fertility will fall to replacement levels by 2064 and global population will grow to no larger than 9.7 billion. Vollset et al. base their lower projection on the anticipation that factors such as increased access to contraception, female education and participation in the workforce are likely to bring fertility rates down much faster than had been previously assumed. Tucker argues that this demonstrates that population growth is not some autonomous force beyond human agency and given this it must be possible to actively manage it by investing in the very same ethical, humane and empowering strategies which are already reducing fertility. Tucker asks what level of investment in such strategies would be required to accelerate the reduction in global fertility from the present level of just over 2.4 to the European average of around 1.5 by 2030.

In many respects, energy consumption is central to the question of population and sustainability. Rees points to fossil fuels as a critical determinant in the massive acceleration of human population growth from the 18th century onwards. Indeed, population growth in all eras can be closely correlated with the availability of energy in the widest sense: the Neolithic agricultural revolution spurred considerable population growth as did earlier changes in hunter-gatherer lifeways (see Feeney, 2019). Yet while increased availability of energy can be seen as inextricably linked with changes in the rate of population growth, population growth itself increases the demand for energy and when that energy is mostly derived from fossil fuels it makes the transition to sustainable energy that much harder to achieve.

Aalok Ranjan Chaurasia's paper looks at the effects of population change on world energy consumption growth and carbon emissions between 1990 and 2019. As emphasised by other papers published in this journal, energy consumption, and in particular its carbon intensity and the changing energy intensity of GDP, is seen by many as one of the key issues in tackling climate change and environmental sustainability more generally. Chaurasia employs a development of the IPAT equation which separates energy use per capita from income per capita to analyse the contribution of population change to energy use and carbon emissions, but also more importantly to separate the direct effect of population growth from the effects of energy efficiency gains.

Chaurasia's research shows that while two thirds of the growth in energy consumption was confined to China, India, the USA, South Korea and Iran, that over 80% of carbon emission growth was accounted for by China, India, Iran and Indonesia. The contrast between the world's most populous countries, China and India, is illuminating with the former accounting for around four times the growth in both energy consumption and carbon emissions. Chaurasia's analysis clearly shows that growth in GDP is the primary driver of energy consumption and carbon emissions, but critically that population is also a key determinant – accounting for up to 20% of the differences between countries in the study. Of particular significance is the observation that (globally) increases in population are shown to offset the impact of energy intensity and carbon reduction measures by over three quarters. However, these offsets vary enormously from country to county and are related to the level of development and the rate of population growth. Chaurasia concludes that population factors are significant in driving increases in energy use and carbon emissions, but that they are not properly integrated into environmental policy. Moreover, population is neglected and in conflict with the objectives of the UN's Sustainable Development Goals since, for example, population growth can be shown to be a significant contributor to economic growth in developing countries such as India.

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