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The journal aims to publish papers exploring all aspects of the relationship between human numbers and environmental issues. It is truly interdisciplinary and invites contributions from the social sciences, humanities, environmental and natural sciences including those concerned with family planning and reproductive health. We also invite contributions from those working for NGOs with interests in population and environmental issues. It is intended that the journal act as an interdisciplinary hub facilitating collaboration and furthering the development of the field. We are interested in publishing original research papers, reviews of already published research and book reviews. For submission details please see our website (**www.populationmatters.org**) or contact the editor: **journal.editor@populationmatters.org**

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The Journal of Population and Sustainability

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Editorial Introduction

DAVID SAMWAYS – EDITOR

The contents of this, the third issue of *The Journal of Population and Sustainability*, once again illustrate the breadth of scholarship required to grapple with the relationships between human numbers and environmental sustainability. With papers covering the development of ideologies of consumerism and economic growth, the idea of the Earth's human carrying capacity, UK immigration in a global context, and the ethical problems surrounding individual reproductive choice, the diversity of concerns is, once again, all too apparent. We also carry a review by Ugo Bardi, professor of Physical Chemistry at the University of Florence and author of *The Limits to Growth Revisited* (2011) and *Extracted* (2014), of Raoul Weiler and Kris Demuynck's *Food Scarcity* (2017).

Whilst reading our first paper, Kerryn Higgs' *Limits to Growth: Human Economy and Planetary Boundaries*, I was reminded of John Maynard Keynes' essay *The Economic Possibilities of Our Grandchildren* (1930). Keynes gazed 100 years into the future and envisaged the society brought into being by the wealth created from compound interest and ever-advancing technology. He anticipated a leisure society where work occupied three hours of a day, the love of money was regarded as a disease, and the biggest challenge was how to meaningfully occupy free time. From the standpoint of 2017 the achievement of Keynes' vision seems a great deal further off than 13 years hence. However, I am struck by how Higgs' paper gave some of the key reasons why Keynes' prediction did not come true, but also by the fact that, in essence, Keynes presents us with the germ of a idea of what a sustainable society might look like.

The articles in this issue are linked via their emphasis on the role of ideas, values and choices in both the generation and amelioration of our current environmental problems. They all, therefore, have an indirect relevance to Keynes' forecast,

both in terms of its failure to materialise and the actions required if we wish to achieve it.

Keynes reasoned that the contemporary issue of technological unemployment, caused by increasing mechanisation of production, was a temporary situation that ultimately would be liberating. Like Marx, Keynes had great foresight and correctly predicted the ever-increasing impact of automation on economic activity, and while not revealing how the dividends of technology would be equitably distributed, Keynes argued that basic needs would be universally satisfied without labour. Although first written at the end of the 1920s, Keynes' essay was not published until after the Wall Street Crash. In this version Keynes argued that the pessimistic view that the economic progress of the 19th Century had come to an end was not correct. While he did not foresee the depth and severity of the Great Depression, he was correct about the still enormous growth yet to come. Undoubtedly, Keynes believed that economic growth was good. Once again he concurred with Marx that technology was eradicating scarcity and liberating human beings from toil. However, this was not growth without end. Keynes believed that a point would be soon reached where "we prefer to devote our further energies to non-economic purposes" (p. 326). Thus leading to a form of steady-state economy with people living "wisely and agreeably and well" (p. 328). Ultimately, Keynes thought that economic appetites would be satiated and further economic growth would be neither necessary nor desirable.

According to Zilibotti (2008) Keynes' optimism about economic growth was not misplaced. Zilibotti calculates that during the half-century after the war GDP per capita quadrupled and that if projected over the century amounts to a 17-fold increase – Keynes anticipated a four to eight-fold increase. Whatever the precise rate of economic growth since Keynes was writing, as Higgs notes in her paper published here, post-war economic growth is unprecedented in human history and has exceeded the capacity of the planet to sustainably provide material resources and absorb waste.

Two important factors should be appreciated in Keynes' essay. Firstly he was only considering the "progressive countries" (i.e. the developed world), and secondly he included the caveat "no important increase in population" (p. 326). When Keynes was writing world population stood at around 2 billion with Europe and North and Central America (largely representing the "progressive countries")

constituting around a quarter of that total, by 2016 the combined populations of Europe, North and Central America had roughly doubled to over a billion with total world population at 7.33 billion (Roser and Ortiz-Ospina 2017).

The aggregate figures for wealth and population reveal relatively little. As Joel E. Cohen's paper *How Many People Can the Earth Support?* published here shows, "the devil is in the detail". Cohen's paper shows that despite rapid global population growth, average well being on a number of indices has improved. However, regardless of this general improvement massive inequality and poverty persists. In particular Cohen demonstrates that while enough grain is presently produced to feed 10-12 billion people, only just over two fifths goes to feed humans directly while a third is used to feed animals to produce meat for those who can afford it (the remainder goes for industrial use). In 2017 800 million people are chronically malnourished.

Even within the "progressive countries" Keynes' implicit assumption that inequality would diminish has proved to be incorrect. Paul Mason (2015) has argued that while income inequality flattened in the mid-20th century, the adoption of neoliberalism in the late 1970s onwards has led to the weakening of workers' bargaining power and a squeeze on incomes.

> If we accept, as Piketty [(2014)] and others show, that modern capitalism is geared to boost asset wealth above incomes, inflation and GDP growth rates, then even rising per-capita GDP can lead to an increase in poverty among growing parts of the population. You get the oligarch's yacht alongside the food bank, forever (Mason 2015).

Furthermore, Porritt and Hines' argue in *Reflections of the Current Immigration Debate in the UK* published here, that the free movement of labour is the principle neoliberal method of keeping wages low and reducing workers' power. This is particularly true for the least skilled strata of British society. While immigration has had a limited but broadly positive economic impact for most people, it has undermined the earning power of unskilled labour and in turn contributed to increasing inequality. The neoliberal drive toward globalisation of the capital, labour and commodity markets has concentrated wealth into fewer and fewer hands both globally and within nation states.

As we have seen, while Keynes had great foresight where economic growth and the development of technology was concerned, he did not anticipate massive population growth and, most importantly, widening inequality. Yet, Keynes was not unconcerned about human numbers. In *The Economic Consequences of the Peace* (1919) he writes:

> Before the eighteenth century mankind entertained no false hopes. To lay the illusions which grew popular at that age's latter end, Malthus disclosed a Devil. For half a century all serious economical writings held that Devil in clear prospect. For the next half century he was chained up and out of sight. Now perhaps we have loosed him again (Keynes 1919, p. 8).

Furthermore, Keynes' writings on Malthus and population (see Toye 2000) clearly show that for a considerable time he was concerned with the return of the Malthusian Devil and that he did not dismiss the idea of natural limits[1].

While population growth and widening inequality are possibly sufficient reasons for Keynes' prediction to fail, there is yet another factor, related to both, which he did not anticipate: the rise of consumerism and the ideology of perpetual economic growth.

Keynes identified two types of needs: absolute and relative. The first, as we have seen, he believed were likely to be universally met by the fruits capital accumulation and technology. The second, "those which are relative in the sense that we feel them only if their satisfaction lifts us above, makes us feel superior to, our fellows" he acknowledged, "may indeed be insatiable; for the higher the general level, the higher still are they" (p. 326).

Perhaps Keynes' acknowledgement of the status ordering nature of human beings is actually one of the main reasons why, despite the satisfaction of basic needs, so many people in the developed world still choose to work long hours and strive for ever higher material accumulation. This, no doubt, would have greatly perplexed

1. However, as John Toye (2000) has made clear, Keynes' views on population were not static. Furthermore his enthusiasm for eugenics, shared by many "progressive thinkers" such as Beatrice and Sydney Webb, is now rightly regarded with considerable distaste.

Keynes since status ordering need not express itself materially and he certainly believed that even if there were those who pursued accumulation "the rest of us will no longer be under any obligation to applaud and encourage them" (p. 329).

The "naturalisation" of the desire to acquire ever increasing wealth and material possessions is so entrenched in modern consciousness that to many the idea that people would choose to consume less in order have more free time seems fanciful. Yet, Weber (1930) alerts us to the role of ideology, specifically the work ethic, as a necessary but not sufficient condition in the development of capitalism. Weber points out that without a work ethic pre-industrial agricultural labourers, usually paid piece-rates during harvest, would actually choose to work fewer hours if the employer raised the rate with the intention of bringing the harvest in more quickly. Weber observed: "A man does not "by nature" wish to earn more and more money, but simply to live as he is accustomed to live and earn as much as is necessary for that purpose" (Weber 1930 p. 60).

Weber's emphasis on the work ethic as a force in the economic growth brought about by capitalism only takes us so far in understanding modern consumer society. Indeed, Keynes was well aware of the power of the work ethic and the possible difficulty of suppressing it ("[f]or we have been trained too long to strive and not to enjoy" (Keynes 1930 p. 327)). However, what Weber alerts us to is the role of ideology – values, beliefs, attitudes – in what appear to be value neutral economic choices. The generation of our current environmental predicament has to be understood in this context.

In her paper published here, Kerryn Higgs gives an account of the history of the idea of economic growth and the development of consumerism that goes a considerable way to understanding why Keynes' expectation of the satiation of material desire failed to occur.

Higgs points out that by the early 20th century the basic needs of most of the population of the United States had been satisfied and industrialists feared a permanent crisis of overproduction. However, writers like Edward Bernays and Victor Lebow realised that the manipulation of consumer desires through advertising could lead to insatiable demand. In particular the stimulation of status consciousness, the creation of new "needs" in tandem with constantly changing products encouraged

a desire for unfettered consumption of new goods and discarding of the old under the banner of "progress". All this encouraged and depended upon the impetus to spend rather than save, and to value material goods over free time – a kind of bastardised version of Keynes' own *General Theory*.[2]

Higgs argues that prior to the 1950s economic growth as a government policy objective was conspicuously absent and neither businessmen nor politicians thought governments should have any role in promoting it. However, post-war governments and international economic agencies the world over embraced the idea of economic growth as an imperative, and it became, and still is, the central and uncontested objective of economic policy. At the same time, the idea of economic development of the third world came into being and redefined well-being in terms of economic growth and the exploitation of resources. In the face of national liberation movements in these "undeveloped" countries, economic growth was preferred over the redistribution of land and resources.

Higgs goes on to draw up a list of environmental problems all too familiar to readers of this journal, including loss of biodiversity, climate change, pollution etc., consequent of this explosion of economic growth and human numbers. Higgs argues that all these problems are indicative of approaching planetary boundaries.

Keynes' vision of an almost work-free steady-state economy has failed to materialise due to a number of related factors including population growth, chronic inequality, consumerism, an ideological commitment to economic growth and environmental damage chief amongst them. Yet Keynes' vision is far from redundant and has provided inspiration for a number of contemporary writers on steady-state economics including Dietz and O'Neill (2013), Maxton and Randers (2016) and Tim Jackson (2017). While there is insufficient space in this editorial to explore the proposals of any of these writers, it's worth noting that the papers

2. Despite the claims of neoliberals like Steven Horwitz (2010), Keynes would not have been in favour of consumerism. Certainly, Keynes argued for aggregate demand management involving the stimulation of consumption in order to smooth out the business cycle, but, as Higgs' article will make clear, this is not the same as the ideology of consumerism. Indeed, Higgs would point to the organisation for which Horwitz is writing, the FEE, as one of the "think tanks" which have promoted the neoliberal agenda of unfettered economic growth.

published in this issue (and indeed previous issues) of *The Journal of Population and Sustainability* all contribute insights compatible with the achievement of a sustainable, low-growth, or steady-state economy.

Higgs argues that we need to challenge the ideologies of economic growth and consumerism, and develop an alternative economic system. Redistributive justice within and between countries will be essential. The rich world will need to reduce material consumption and allow the developing world to achieve material security. She points to Herman Daly's (2008) ten point program including ecological tax reform, policies to deal with unequal income distribution and the stabilisation of population, as a means to tackling our current predicament.

While Cohen's approach can be seen as critical of authors that have raised concerns about human numbers in combination with economic growth such as Meadows et al.'s *Limits to Growth* (1972), it is also complementary to them. When addressing the issue of the planet's human carrying capacity Cohen argues that natural constraints are only part of the equation and that choices and values play a critical role. Thus, as we saw above, more than enough food is currently produced to feed the entire global population, but the persistence of poverty and inequality, and a range of other collective and individual choices and actions, lead to the greater part of a billion people being malnourished. The impact of such choices of course go well beyond the ability of agriculture to feed the world's population. Putting aside the issue of our current dependance on fossil fuels to produce fertilizer, the growth in the consumption of meat, and even the choice of which animals are regarded as culturally acceptable as food, affects the envionment in different ways.

Since publication of his 1995 book *How Many People Can the Earth Support?*, Cohen has argued for extending universal primary *and* secondary education in the developing world. This will allow people to create and use better technology, it enables people to understand their own bodies and better regulate their fertility, and it empowers them to demand better governance (Cohen 2007). However, without meeting a standard of basic nutrition prior to and in the first three years after birth (the time during which the brain is developing fastest) children born into the poorest regions of the world are already significantly disadvantaged. Cohen argues that addressing this issue is a vital prerequisite to the success of any education programme leading to the achievement of the desired outcomes.

As Cohen's work makes clear, migration is an important factor in the relationship between population and sustainability. However, Porritt and Hines argue that the "progressive centre-left" has a particular blind spot where it comes to immigration issues (and indeed to the consequences of world population growth) and tends to be committed to an "open borders" perspective, often characterising attempts to raise the issue as "xenophobic". Yet this unintentionally supports neoliberal free movement of labour policies with their tendency to increase inequality. As a counter to this, Porritt and Hines propose a "progressive internationalism" consisting of international trade and development designed to address the factors where people perceive their life chances being improved from leaving their homeland. Critically these aid and development policies should be tailored to enhance the employment prospects of the young, and most importantly, to improve women's access to education and reproductive healthcare which will help reduce population growth.

Many advocates of a low growth or steady-state economy, such as Dietz and O'Neill (2013) and Maxton and Randers (2016) see the shrinking of the developed world's population as essential in shifting the global imbalance in resource consumption and environmental impact. Julian Roche's paper is a response to Sarah Conly's *One Child: Do We Have a Right to More* (2016), a summary of which was published in the first issue of this journal. Roche identifies Conly's earlier concept of 'coercive paternalism', where individuals are forced to act in their own interests by morally concerned external agents such as government, as a limit on the policy options for dealing with population growth. According to Roche, Conly's 'one-child per couple' position, apart from being poorly defined and in the process of being rendered obsolescent by technology, is a direct consequence of her commitment to the liberal concept of the individual and the centrality of the associated notions of individual autonomy and rights. Roche argues that by substituting a more relational and communitarian concept of the individual, solutions to deal with population growth are better solved by transcending narrowly defined individual interests and notions of rights and autonomy. This wider approach Roche contends, has a much greater chance of dealing with the issue of human numbers and is likely, with appropriate policy development, to be more effective, democratic, and, importantly, more just.

In conclusion, Keynes' prediction of a steady-state economy should perhaps be reinterpreted as a global aspiration. As Maxton and Randers (2016) observe,

automation of both the production of goods and the provision of services is already with us, and as this becomes more widespread has profound implications for our economic system that "business as usual" cannot deal with. Keynes' vision of a society where machines do all the work may well be a reality much sooner than we think, but creating a sustainable society by overcoming the entrenched discourses of consumerism and economic growth, as well as tackling inequality both within and between nations may take longer. The transition will require the kind of government intervention approved of by Keynes but abhorred by neoliberals. As Maxton and Randers acknowledge, the biggest barrier is not economic but political. However, with the entrenchment of neoliberalism in national governments, international agencies, and corporate lobbying networks, overcoming established short-termist discourses will not be easy.

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Limits to Growth: human economy and planetary boundaries

KERRYN HIGGS

Kerryn Higgs is an Australian researcher and author who published Collision Course: Endless growth on a finite planet *(MIT Press) in 2014. She completed her PhD with the School of Geography and Environmental Studies at the University of Tasmania, where she is now a University Associate. She is a Fellow with the International Centre of the Club of Rome.*

Abstract

The idea of physical limits to human economic systems is advanced by physical scientists and ecological economists, as well as appealing to the common sense proposition that unending growth in physical processes such as material extraction and waste disposal will ultimately be inconsistent with any finite entity, even one as large as the Earth. Yet growth remains the central aim of business and government almost everywhere. This paper examines the history of the idea of economic growth and the many influences and interests that supported – and still support – its enshrinement as the principal aim of human societies. These include the apparatus of propaganda in favour of corporate interests; the emphasis on international trade; the funding of environmental denial; and, underlying all these, the corporate requirement for profit to continue to increase. The dominance of these influences has serious consequences for the natural world while growth has failed to solve the problems of poverty.

Keywords:

Limits to Growth; propaganda; consumerism; environmental denial; planetary boundaries.

The authors of *The Limits to Growth* (Meadows et al., 1972) were not the first to draw attention to physical limits on the expansion of the human economic system, but they enjoyed substantial attention, especially in the 1970s, and brought the concept into mainstream thinking. The project came out of the concerns of the founding members of the Club of Rome and drew on the discipline of systems analysis being developed at the Massachusetts Institute of Technology (MIT).

The Club of Rome, founded by Italian industrialist Aurelio Peccei and Scottish scientist Alexander King, brought together a select group of prominent, mostly wealthy individuals who wanted to address what they called the *problematique*, translated as "the predicament of mankind". Peccei saw post-war economic and industrial advance as a double-edged sword and described himself as "perplexed and worried by the orderless torrential character of this precipitous human progress" (Barney, 1982, p.607). Soon after it was founded in 1968, the Club commissioned the Limits to Growth project at MIT with researchers Donella Meadows, Dennis Meadows, Jørgen Randers and William Behrens.

The MIT team identified five major aspects of this predicament: accelerating industrialisation, rapid population growth, extensive malnutrition, depletion of non-renewable resources, and environmental decline. They formulated this question: how could growing populations, locked into ever-expanding industrialisation, avoid immense environmental degradation, exhaustion of the resources on which everything depends, and the social chaos that would be likely to follow decline or collapse? To answer this question, they devised World3, a computer program that combined extensive data about the many interacting aspects of the economy and the environment, with different scenarios about changes that might be made. These scenarios ranged from business as usual (the standard run), through several combinations that assumed extremely advanced technology, to scenarios where both population and physical throughput were stabilised. The standard run led to collapse around the middle of the current century. Even massive technological advance could not avert this outcome, but there were scenarios that could: those that stabilised population and wound back the scale and rate of material extraction and waste.

The book remains the best-selling environmental book ever published, but its reception in the political and economic mainstream was mixed. In the early years, both US President Carter and Prime Minister Trudeau of Canada took it

seriously and launched parallel studies (Barney et al., 1981; Barney, 1982; Voyer and Murphy, 1984). From the beginning, however, most economists ridiculed the idea that human economic systems have physical limits (Beckerman, 1972; Economist, 1972; Nordhaus, 1973; Solow, 1973), an attitude which came to prevail. One characterised the World3 computer program as "Garbage in, garbage out". Robert Gillette (1972), who reported for *Science* at the launch of the book, noted that the "assumption of inevitable economic growth" constitutes "the very foundation" of the economics profession – which may help to explain the intensity of the assault from economists.

In recent years, several researchers (Hall and Day, 2009; Turner, 2014) have compared the Meadows projections with what has actually happened. The correlation between the standard run (business as usual) and real world trends over the intervening years is extremely close. Hall and Day (2009) could not find "any model made by economists that is accurate over such a long time span". Given that the projections up to 2010 have proven accurate, it would seem wise to question the pursuit of business as usual.

Unprecedented Growth since 1950

Growth, of both economies and populations, was indeed "torrential" in the years after the end of World War II, especially the first three decades. The world's population increased from just over 2.5 billion in 1950 to almost 4 billion in 1975.[1] In the same period, world GDP more than doubled. Thus, by 1975, the base of both the economic system and human numbers was already immense and doubling times were short. By the 1990s, annual increase in world GDP has been estimated to approximate the entire global output of 1900, about one trillion in 1990 US dollars (DeLong, 1998).[2] Although economists like to argue that humans have been exploiting their resources and pursuing economic growth since the Stone Age (Solow, 1974; Beckerman, 1972), there has never been anything like the twentieth century.

Australian climate scientist Will Steffen and colleagues have shown just how unusual it was, in the sets of exponential graphs known as "The Great

1. It is estimated to have exceeded 7.5 billion during 2016.
2. DeLong uses several methods. Estimated annual additions for the 1990s vary from half the entire economy of 1900 to the entire 1900 economy.

Acceleration" (Steffen, Broadgate, et al., 2015). The graphs start at the year 1750 and run to 2010; the disjunction around 1950 is clear in all of them. Figure 1 shows the economic aspects of the growth boom. Despite the financial crisis of 2007–2008, the continuation of this trajectory is sought, to the maximum extent possible, by governments and international organisations.

Socio-economic trends

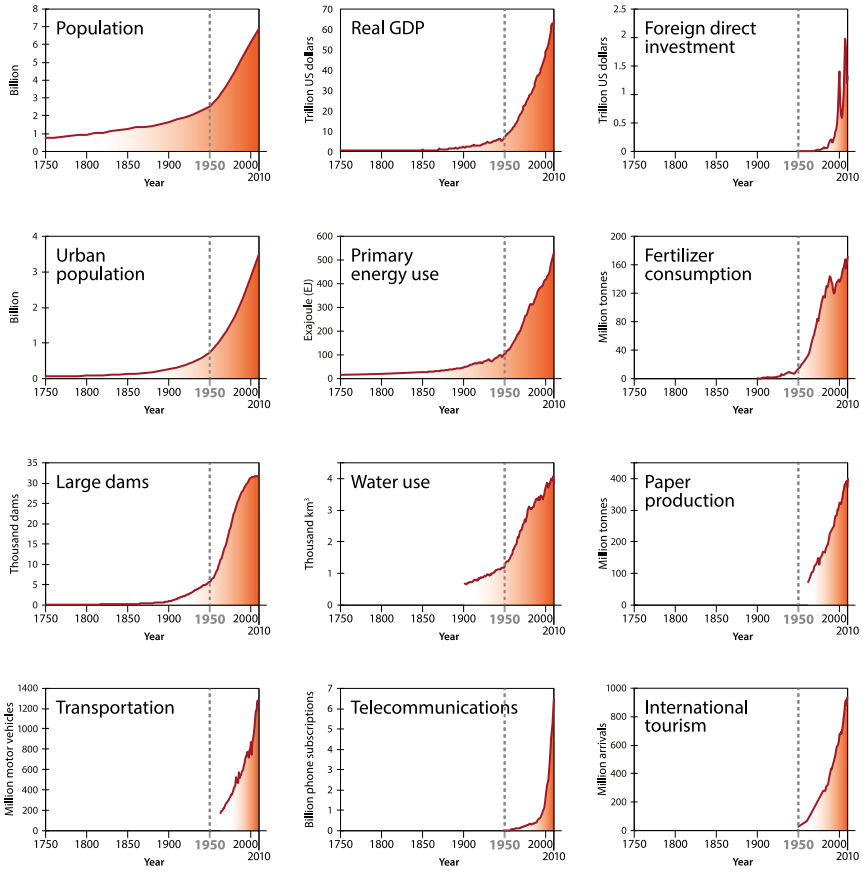

Figure 1. The Great Acceleration, social and economic aspects, courtesy Will Steffen.

The economists' intense attack on *Limits to Growth* reflects the rift between the core assumptions of mainstream economics and those of the physical sciences. Basic economics textbooks depict a standard model where the circular flow between production and consumption has no natural context: producers and consumers are seen to function without any reference to the physical world of resources and wastes. Ecological economists, on the other hand, and most physical scientists, accept Nature as the essential foundation of the human economy; in this framework, production requires resource inputs from the physical world and sinks where its wastes can be absorbed: depletion and pollution are inescapable.

In mainstream economics, economic growth is understood to be the result of two factors: capital and labour. This picture was developed while energy and resources were plentiful; economists could ignore the physical basis of economic activity, including the role of energy. Physical scientists, on the other hand, regard energy as the "master resource", since no other commodity can be produced without it (Cleveland, 1991; Zencey, 2013).[3] One of the ecological economists, Kenneth Boulding, warned in 1966 that the "cowboy" economy (which had commanded the limitless resources of an "empty world") was over; humanity faced a new situation which he called "spaceship Earth", a world that was rapidly filling up. Odd as it may seem, economics has yet to fully acknowledge that energy is just as essential to production as are labour and capital, even though the massive economic growth since 1950 has depended on it.

Economic growth as a corporate goal: inventing consumerism

Notions of limits to economic growth threaten many powerful groups that depend on continually rising profits and the expansion of the physical economy.

3. By the 1950s, empirical studies had shown that capital and labour could explain only one seventh of observed economic growth in the US. There was no clear candidate for the rather large missing ingredient, although "technical progress" was often assumed to provide the best explanation (Ayres and Ayres, 2009, p.11). Later, Robert Ayres (a physicist) and Benjamin Warr identified the missing factor as energy – or, more exactly, as the increasing efficiency with which energy and raw materials are converted into useful work. In this explanation, technological improvement plays a part, but Ayres and Ayres (2009, pp.9–18) stress that: "labour and capital *extract* energy; they don't *make* it". Thus energy is a *prerequisite* for, not a *product* of economic activity.

One of the crucial innovations of capitalism[4] was the system of accumulation, where production surpluses are largely devoted to expansion of the enterprise. Growth is indispensable to such a system, and the corporations that emerged around 1900 were determined to maintain it. The immense productive powers developed over the nineteenth century had met the basic needs of most of the US population by the early twentieth century and the captains of industry feared that the system had triggered a permanent crisis of overproduction. The American capitalist economy confronted the plenty it had created as a threat to its very existence.

A consumer solution, however, was simultaneously emerging. Edward Bernays[5] (2005), one of the pioneers of the public relations industry, pointed out in 1928 that mass production can only be profitable if it ensures steady or increasing demand, which, he suggested, could be accomplished "through advertising and propaganda". Although the practice of inciting consumption has earlier roots (Higgs, 2014, pp.68–69), the first major surge of mass consumption was promoted in America in the 1920s. A "new economic gospel of consumption" was urged (Cowdrick, 1927); new needs could be created, with advertising enlisted to "augment and accelerate" the process (Hunnicutt, 1996). People could be encouraged to give up thrift, value goods over free time and, with ever-increasing aspirations, they would always be chasing a receding goal. Just before the Wall Street Crash, President Herbert Hoover's Committee on Recent Economic Changes (1929) welcomed the "grand... expansibility of human wants and desires", celebrated an "almost insatiable appetite for goods and services", and foresaw "new wants that make way endlessly for newer wants, as fast as they are satisfied". People were encouraged to board an escalator of desire (a stairway to heaven, perhaps) and progressively ascend towards the luxuries of the affluent.

Although the Great Depression interrupted this process, it resumed after World War II with an intensity stimulated by corporate advertisers using debt facilities and the new medium of television. As retail analyst, Victor Lebow, put it in 1955:

4. With the partial exception of Cuba, socialist and communist economies have been just as dedicated to industrialisation and economic growth as their capitalist rivals. Eastern Europe and the former Soviet Union were even more severely polluted than the West, as is China today; although a state-controlled economy, China is hardly "socialist" (Higgs, 2014, pp.5–7, 11–13).
5. Nephew of Sigmund Freud.

> Our enormously productive economy demands that we make consumption our way of life... that we seek our spiritual satisfaction, our ego satisfaction, in consumption. … We need things consumed, burned up, replaced and discarded at an ever accelerating rate (Kettles, 2008, p.47).

Vance Packard (1959) described the advertising men of this new era, putting "sizzle into their messages by stirring up our status consciousness", making what were once luxuries into the "necessities of all classes". Sold as status symbols perhaps, it was endless material objects that were being consumed.

The prospect of ever-extendable consumer desire, characterised as "progress", promised a new way forward for modern manufacture, a means to perpetuate economic growth. Progress required the endless replacement of old needs with new, old products with new. Notions of meeting everyone's needs with an adequate level of production did not feature. In this sense, the twentieth century capitalist era unleashed desire with its complex individual peculiarities and set it loose in the marketplace of material goods, supplanting basic survival needs as the purpose and driver of economic growth. Up to now, there has been little change in this strategy. As we run up against the limits of material production, nothing could be more inimical to finding solutions.

Economic growth as policy goal: the idea takes over

In the reports of the IMF, World Bank, Organisation for Economic Co-operation and Development (OECD) and G20, and in the speeches of our politicians, economic growth is seen as imperative, and it may seem that government – and international – economic policy has always embraced this view. However, Australian economist H W Arndt (1978) demonstrated that the idea of economic growth as a policy objective appeared quite abruptly in the 1950s – as did the idea of "development". Governments pursued neither material development nor economic growth during the first half of the twentieth century, academic economists rarely discussed it, and neither businessmen nor politicians thought governments had any role in promoting it (Arndt, 1978).

At his inauguration in 1949, President Harry Truman signalled a departure from this position[6], announcing the intention of the US to extend modern industrial production to every corner of the earth: "More than half the people of the world are living in conditions approaching misery…. Greater production is the key to prosperity and peace.... [and will require] a wider and more vigorous application of modern scientific and technical knowledge" (Truman 1949).

Soon afterwards, a new field of economics emerged, defining the well-being of the world's people in terms of economic growth and the exploitation of resources. The new "development economists" echoed Truman's vision of technology as the engine of human progress, and stressed capital accumulation as the central facilitator. Energy did not play any role in their theories. Walt Rostow (1960) held that "the age of high mass-consumption" is the ultimate stage of progress. W Arthur Lewis (1954) argued that traditional cultures and subsistence livelihoods must be swept away and replaced by the industrial money economy, a necessary and inevitable process.

"We are interested", Lewis wrote, "not in the people in general, but only in the 10 per cent of them with the largest incomes.... The central fact of economic development is that the distribution of incomes is altered in favour of the saving class". In this respect, the development economists adopted a "trickle down" approach to solving the misery Truman lamented. Lewis focussed on consolidating the wealth of the rich, who would instigate an economic "take-off"; at a later stage, he believed, the resulting economic growth would reach the poor. In recent times, neoliberal ideology embraced the same idea, with its claim that cutting taxes for the wealthy leads them to invest and therefore benefit everyone. Neither the expectations of the development economists nor the claims of the neoliberals are supported by empirical evidence. In both cases, wealth has "trickled up" (Higgs, 2014, pp.119–123).

Quest for the bigger pie

Several imperatives underpinned the new scramble for economic growth in the post-war world. After the Great Depression, full employment was regarded as an essential policy objective and economic expansion was believed to be the only practical way to achieve such a goal. In the "developing" world too, where national

6. See Hickel (2017, pp.7–9) for an account of how this came to be included in the inaugural address.

liberation movements had to be accommodated or neutralised, growth was preferred to redistribution of land or resources. Although growth has increased the numbers of the middle class in some developing countries, especially China, and despite persistent claims that economic growth has "lifted millions out of poverty", the reality is not so rosy. More than half the world's people still live in poverty, without reliable material security, even if the definitions used by the rich world's institutions tend to obscure the fact. Prosperity is concentrated among a privileged minority (Higgs, 2014, pp.105–162; Hickel, 2017).

The so-called "bigger pie" was promoted as the obvious solution to all social problems – debt, unemployment, poverty, and even the environmental damage involved in baking it. It still remains the primary strategy for the institutions of the OECD world, whether businesses, national governments, or the international bodies allied to business. In these forums, no-one asks where we are to find the ever less accessible ingredients for this ever more gargantuan pie.

Post-war theories of economic growth harboured two key assumptions – and continue to do so. Firstly, economic growth is regarded as an inevitable stage of human civilisation, a natural and linear progression from more "primitive" social forms. Secondly, economic growth is seen as a process of indefinite duration, with no limits in space or time. On a graph, it is a curve which continues upward forever, permanently exponential. Such beliefs are a form of magical thinking. They ignore problems of resource scarcity, especially that of energy, they ignore waste and they ignore the destruction of the natural world in which everything is based.

Arndt's fears that the limits critique would end the pursuit of economic growth were groundless; in fact, the influence of such ideas waned as neoliberalism increasingly monopolised the economic discourse, and began to dominate government policy from around 1980 when Ronald Reagan was elected as US President, and Margaret Thatcher had just settled into Downing Street.

Naturalising the "free market"

Neither natural nor inevitable, the so-called free market has received massive advocacy for more than a century – in order to create, retain and extend public acceptance. The roots of this process lie back in the early decades of the twentieth century, just as the modern corporation was emerging (Higgs, 2014, pp.167–169).

By the 1920s, with Edward Bernays in the lead, public relations (PR) began to gain ground as a career path. As Bernays (2005, pp.37–38) explained in 1928, with a candour rarely heard these days:

> The conscious and intelligent manipulation of the organised habits and opinions of the masses is an important element in democratic society. Those who manipulate this unseen mechanism of society constitute an invisible government which is the true ruling power of our country. … It is they who pull the wires which control the public mind.

Bernays described himself as a "propaganda specialist" or a "public relations counsel". He and his colleagues were anxious to offer their services to corporations and were instrumental in founding an entire industry that has since operated along these lines, selling not only commodities but also opinions on a great range of social, political, economic, and environmental issues.

One early PR man, Ivy Lee, simply made up facts to suit the purpose (Higgs, 2014, p.170), a precursor of the "alternative facts" which have become more palpable than ever since 2016. Later, with the advent of Bernays, PR centred on the careful construction of image: for example the idea that corporations exist to serve, rather than turn a profit; the displacement of the term "big business" with a new enemy, Big Government; the denigration of public servants and politicians as "fat cats" while CEOs were depicted as models of generosity; and the replacement of terms like capitalism, laissez faire and private enterprise with the sanitised expression "free enterprise" (Higgs, 2014, pp.175–178).

The work of hired propaganda specialists was augmented by that of think tanks later in the twentieth century. Just a handful of these institutions predate 1970; but by 2015, their number was estimated at almost 7,000 (McGann, 2017). Funded by corporations that prefer to avoid regulation (for example tobacco, asbestos, chemicals, fossil fuels, mining, car manufacturers), business-friendly activists set out to "litter the world" with "free enterprise" think tanks (Cockett, 1995, p.307). In the US, the family foundations where fortunes of corporate leaders are often held also chipped in handsomely (Higgs, 2014, p.90, pp.191–192).

These ferociously proliferating think tanks have disseminated industry propaganda as "independent research" ever since. Most are tax-exempt and vociferous claims

to independence disguise their political ties. One think tank operative, however, told researcher Georgina Murray (2006) that it would be naive to imagine that think tanks are established "by Santa Claus or the tooth fairy". Rather, as Irving Kristol (1977) admitted, they are always intended to "shape or reshape the climate of public opinion". Think tank staff enjoy immense influence in the media of the English-speaking world, where they are depicted as scholars on a equal footing with peer-reviewed academics and have also been recruited into governments. Heritage, American Enterprise Institute and Hoover supplied 150 of Reagan's staff – and numerous Heritage operatives were "borrowed" by George W Bush. In the UK, the Thatcher government owed much to the Institute of Economic Affairs and the Centre for Policy Studies (Higgs 2014, pp.96–98, 214–215).

Think tanks promoted the bogus standard of "balance" in place of impartiality and accuracy, as they pursued "equal time" in media and educational institutions. Analysis of the US prestige press between 1988 and 2002, showed that "balanced" reporting successfully obscured the scientific consensus on global warming by giving equal, or even greater, space to those who denied that climate change was occurring (Boykoff and Boykoff, 2004). This trend is symptomatic of multiple efforts to undermine any science that threatens polluting industries (Higgs, 2014, pp.211–238) and demonstrates the efficacy of "balance" as a tool of obfuscation.

The drive for "free trade"

By the early 1980s, neoliberal ideology was established as the economic creed of the governments of the UK, US and Australia and had begun to penetrate international institutions. When assisting developing countries, the IMF now insisted on Structural Adjustment Programs which required strict market policies in exchange for its help. These programs were rarely in the interests of the citizens of these countries: privatisation, deregulation, balanced budgets, abolition of welfare measures and removing barriers to foreign investment usually disadvantaged the poor.

By 1986, the General Agreement on Tariffs and Trade (GATT), founded in 1948, had attracted 108 member countries and slashed tariffs by 75 per cent. Like "free enterprise", free trade is not so much about freedom, but about abolishing rules for corporations and substituting rules for governments and citizens. Already, under the GATT arrangements, rules relating to environment, health or working conditions were excluded as not "trade-related". The World Trade

Organisation, fiercely pursued by corporate lobbyists, was finally established in 1995, and followed the same blueprint. Dispute panels of both entities were run by corporate lawyers or economists with no input from environmental experts.

Under the trade regime of the GATT-WTO system, trade has priority over environmental, health, and social justice considerations, regardless of the wishes of a government and the people it represents. To enforce trade obligations, the rules penalise countries if they choose to assess risk and protect citizens or environment under their own standards. For example, it is regarded as irrelevant if fish are caught with collateral slaughter of dolphins, or if residues of pesticide or growth promoting hormones exceed local limits. The burden of proof is reversed, so that citizens must prove commodities are unsafe rather than manufacturers having to show they are safe.

Although the GATT concentrated on removing tariffs on actual goods, the WTO and subsequent multi-party agreements such as the North American Free Trade Agreement, moved to abolish restrictions on capital flows, making it nearly impossible to prevent stampedes of capital in and out of countries on speculative errands. Overall, economic goals gained precedence over all other priorities. By the new century, business priorities were entrenched in public discourse, government policy, and international institutions (Higgs, 2014, pp.246–254). Economic growth was established almost everywhere as the only way to solve any problem. Environmental protection and social justice, both national and worldwide, were now deemed to depend on it.

Approaching the planetary boundaries: four major problems

Over the twentieth century, physical production increased twenty-fold and human population quadrupled. The consequences continue to cascade through the natural and human world, literally liquidating life on earth. Although the roots of this post-war growth lie deep in our history, it was not until about 1950 that the scale of the human project began to outgrow planet Earth decisively. It might not have mattered so very greatly at other points in history, but frantic attempts to restart the growth curve of the past 70 years and to enshrine economic growth as the central element in government policy are now in conflict with physical reality.

Figure 1 showed the economic aspects of the growth boom. Figure 2 shows the corresponding physical changes in the natural world. From the 1960s onwards,

scientists such as Rachel Carson sounded alarm about various problems associated with growth, but this was not the case in governments, bureaucracies and public debate, where economic growth was gradually being entrenched as the central objective of collective human effort. The transition to service economies in developed countries has not moderated the global trajectory of either economic or natural impacts, since our consumption continues to increase, with even greater quantities of far cheaper material objects imported from the countries that now conduct manufacture.

Earth system trends

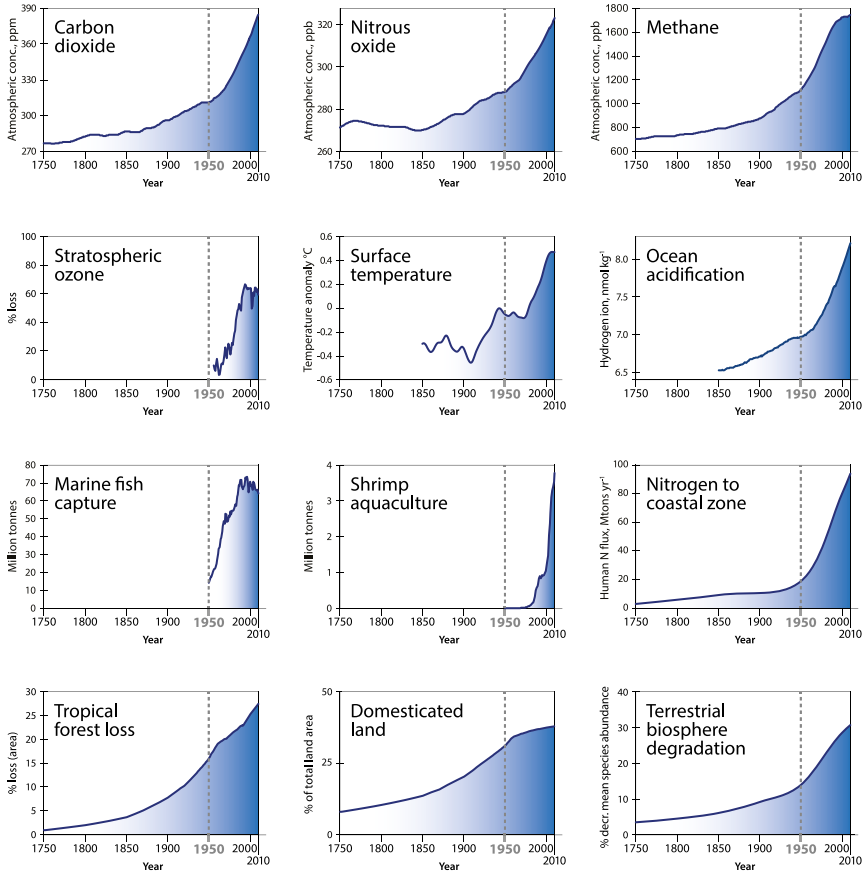

Figure 2. The Great Acceleration, impacts on Nature, courtesy Will Steffen.

The concept of planetary boundaries has been developed by a team led by Johan Rockström of the Stockholm Resilience Centre and Will Steffen from the Australian National University. It is a work in progress and the exact extent to which we are breaching these boundaries is still being quantified; the teams' most recent paper (Steffen, Richardson, et al., 2015) argued that two problems are already extremely dangerous and two others are well on the way.

Biodiversity

The boundaries team argues that the most serious problem is loss of biodiversity.[7] We are losing species 100 to 1,000 times faster than the background rate through geological time and the world lost something like 50 per cent of all its mammals, birds, fish, amphibians and reptiles in the forty years following 1970. This research refers to numbers of animals, not species, but smaller populations are increasingly vulnerable (Ceballos et al., 2015; WWF, 2014).

Trade plays a crucial role in obscuring the location of the ecological damage embodied in consumer products. It allows the people who consume most of the goods to transfer the damage involved to the generally much poorer people who host the extraction of the materials they are made from and the factories where they are made. Manfred Lenzen and his team (2012) estimated that some 30 per cent of extinctions are related to trade. The website shipmap.org gives a graphic picture of the immense scale of trade by sea; trade by air is also extensive. My own country, Australia, occupies an unusual position for a developed country. Mainly through agriculture – and to some extent mining – we sustain more ecological damage on behalf of others than we export through consuming products made elsewhere. Consumption in the US, Japan and Europe, however, transfers significant ecological damage, especially to countries in Africa and South-East Asia.

Disruption of biogeochemical cycles

For Steffen and colleagues the second most immediate danger lies in the impact of fertilisers: the nitrogen and phosphorous cycles are radically disrupted. In Nature, most nitrogen was inert in our atmosphere (though mobilised by bacteria

7. Most serious in the sense of most well advanced. Many scientists argue that non-human species and ecosystems have intrinsic value, a view I share; but even if one rejects this view, humans nonetheless depend on the fabric of life on earth for survival – for food, clean water, pollination and numerous other ecosystem services as well as for novel substances, including drugs (see Crist, Mora and Engelman, 2017).

and leguminous plants). Mainly through making fertiliser, nitrogen is now flooding through our rivers, groundwater and continental shelves, causing algal blooms and dead zones where fish, molluscs and aquatic insects may die, sometimes in large numbers.[8] In the case of the other widely dispersed fertiliser, phosphorous, there is an added danger – phosphate rock is a resource in decline, with grim implications for agriculture (Cordell and White, 2014). Phosphorous is an element, one of the indispensable building blocks of DNA, and no market on earth will be able to manifest a substitute, though it could be recovered from human waste.

Land use changes

Land use change is in the "amber zone", close to crossing the boundary into extreme danger; it is also implicated in the threat to biodiversity. Humans are still clearing millions of hectares of vegetation every year and draining wetlands. Tropical forests of Asia and Africa are being replaced by palm oil plantations, also expanding in Latin America, where clearing already provides cattle pasture, soybean and sugar cane. Oil palm plantations involve the death of immense numbers of individual animals and the annihilation of vast tracts of tropical forest. In China and South Korea, wetlands that support migrating birds are being drained and transformed into ports. Growing populations, in both rich and poor countries, contribute to this pressure (Crist, Mora and Engelman, 2017).

Global warming

Also in the amber zone is global warming. We are well on the way to a very hot planet and, to remain below the 2°C target, we require technologies which do not yet exist for extracting carbon from the atmosphere. Even if the commitments made in Paris are all honoured, it will already be 2°C hotter than pre-industrial times[9] by 2050 and at least 2.7°C hotter by 2100. The aspirational 1.5°C target is likely to be reached by the early 2030s (Watson et al., 2016).

This situation is better than the likelihood of 4°C which applied before Paris, but there is no guarantee that we will limit the damage to 2.7°C. Even if we do, that temperature will reduce crop yields, make many places unliveable, melt the

8. Humans now produce more reactive nitrogen than natural processes do. Excess nitrogen involves hazards in addition to eutrophication: the greenhouse gas nitrous oxide (N_2O) is released during fertiliser application; nitrate may also leach into groundwater and contaminate drinking supplies.
9. Usually defined as pre-1870.

glaciers that supply water to billions in Asia and South America, destroy coral reefs and many other species, and produce significant – even catastrophic – sea level rise. James Hansen and his team (2015) regard 2°C as already posing a dangerous sea level threat, as much as 3m this century. The Greenland icesheet is melting at an accelerating rate. Not considered likely a decade ago, the entire coast of West Antarctica is dotted with ice shelves that are shrinking or collapsing as warm seawater intrudes underneath. Glaciers are speeding up as a result; Pine Island glacier is considered to be melting irreversibly, as is Thwaites and other adjacent glaciers (Rignot et al., 2014). It is expected to take several centuries before really catastrophic sea level rise occurs, but Hansen et al. (2016), as well as many glaciologists, warn that the melting of the polar icesheets involves non-linear processes of disintegration, so the timing is unknown and may be far quicker than assumed.

Pollution

Alongside these four major crises (species loss; disruption of the biogeochemical cycles; land clearing; and global warming), Steffen's team is also aiming to quantify how close we are to being overwhelmed by pollution and novel substances. This aspect of their project is ongoing, but we do know that there are more than 5 trillion plastic fragments in the ocean, so prevalent that 90 per cent of sea birds are now ingesting them, while deep sea creatures are eating micro-plastic fibres disgorged by our washing machines (Eriksen et al., 2015; Taylor et al., 2016). And we do know that the ocean is acidifying.

Conclusion

As the historian Dipesh Chakrabarty (2009) noted, what is new about the pursuit of the study of history in the twenty-first century is the need to address the intersection between natural history and human history. The key to this collision is the concept of scale, an insight brought to prominence by the ecological economists. Herman Daly and his colleagues perceived that the scale of the human project in relation to the scale of the planet had reached an unsustainable ratio. Especially since World War II, the human project has altered – and continues to alter – the actual physical condition of the earth.

While deniers of ecological crisis like to argue that notions of human impacts on the geophysical scale are laughable, this attitude reveals an ignorance of natural

history. It is scientifically uncontested that humble cyanobacteria microscopically producing oxygen over two or three eons created an oxygen-rich atmosphere suitable for complex life, including ours. If algae can have planetary impacts – expressed very slowly, but unquestionably a geophysical force – big animals such as humans are obviously in a position to change the planet rather faster.

Herman Daly's ten-point program (2008) is an excellent example of the sweeping changes ecological economists consider necessary, most of them totally unacceptable to corporate capitalism. His policy summary includes ecological tax reform; limitations on unequal income distribution; the re-regulation of international commerce; the downgrading of the IMF, World Bank, and WTO; the abolition of fractional reserve banking; stabilisation of the population; and the transfer of the remaining commons to public trust. Under the current economic system, there seems little to no chance that any of these measures would be adopted by governments that exist at the pleasure of market forces.

And yet, structural change is indispensable. Some propose a transition to socialism, others hope to tame the capitalist economy and establish a steady state economy. Both options seem equally hard to imagine in the neoliberal era. However, to hijack Margaret Thatcher's famous expression, "there is no alternative".

We need a different kind of economy, one designed to meet needs rather than create them; we need to abandon the consumer path to human advancement and the reduction of our choices to monetary terms. The consumer template for the human future has outworn its usefulness. Stimulating consumption in the interests of growth and chasing economies of scale was, perhaps, suitable for the "empty world". In the "full world" (and getting fuller) we need redistributive justice within and between countries and a plan for the rich world to reduce its material demands to allow space for the rest of the world to reach material security.

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How Many People Can the Earth Support?[1]

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Two thousand years ago, the Earth probably had 100-300 million people. The human population reached one billion in 1800-1830, and seven and a half billion in 2017. Adding the latest billion took 12-13 years. Another billion people are expected in the next 12 years.

Though the number of people more than doubled from about 3.7 billion in 1970 to 7.5 billion in 2017, experts dispute whether the number of people will ever double again to 15 billion. Nevertheless, the population of Africa, the continent with by far the lowest income per person and by far the fastest rate of population growth, will nearly quadruple between 2015 and 2100, according to the United Nations' 2015 projections.

At current birth rates, a woman has 2.5 children during her lifetime on average worldwide, still above the 2.1 children per woman that would stabilize population size in the long term. The population would double in 59 years if it continued to grow at its present rate of increase of nearly 1.2 percent per year, but a constant growth rate seems very unlikely. It is much more likely that the average number of children per woman and the population growth rate will continue to fall as they have over the past half century.

1. This paper was first published in French translation as "La capacité humaine de la Terre", Revue Projet n°359, été 2017.

Despite rapid population growth, average human well-being has improved. For the world, life expectancy at birth (or average life length) rose from 46 years in 1950–1955 to 70 years in 2010–2015, by UN estimates. In 2015, Africa's average life length was 60 years and rising, but remained far below Northern America's life expectancy of 79 years.

While the global number and the global fraction of chronically undernourished people fell over recent decades, a global pattern of local hunger persists in parts of Africa, south Asia, and Latin America. The estimated number of chronically undernourished people dropped from 940 million around 1970 to fewer than 800 million in 2017. Among the world's roughly 675 million children under 5 years old, an estimated 156 million (nearly one-quarter) are stunted (short height for age), which is an irreversible, disabling result of chronic malnutrition, and another 50 million are wasted (too thin for height), a result of acute malnutrition or malabsorption.

Widespread chronic and episodic hunger persists despite current annual production of about 2.5 billion tonnes of cereal grains, according to the Food and Agricultural Organisation. These cereals could provide adequate nutritional energy to 10-12 billion people, if everyone had enough income to buy food in world grain markets. However, in 2015–16, only 43% of cereals fed humans; another 36% fed animals to provide meat for people wealthy enough to buy meat; and 21% went to other, mainly industrial uses. Earth could nourish all people well if people chose to end hunger.

Future changes in numbers of children, duration of life, family structure, migration, and urbanization; nutrition, health, and education; economic growth and trade; war and peace; global and regional climates, oceans, and life forms, are uncertain. One source of uncertainty that most demographers overlook is this: Can the Earth support the nearly 4 billion additional people that the UN projects for 2100 (with a 95% range of uncertainty from 2 billion to 6 billion additional)? Can the Earth continue to support the 7.5 billion people it has in 2017, at present or better levels of well-being? How many people can the Earth support?

In 1679 Antoni van Leeuwenhoek estimated not more than 13.4 billion. Since 1679 at least ninety additional estimates were published. These estimates of the Earth's

"human carrying capacity" ranged widely, from less than one billion to more than a billion billion billion. There is neither an increasing nor a decreasing trend in these estimates. The scatter has increased with time, contrary to what one might expect from estimates of a constant of nature. One conclusion is immediate: many of the published answers cannot be nearly right – or there is no single right answer.

That there is no single right answer becomes clear when the methods used to obtain these estimates are examined. One commonly used method assumes that a single factor, usually food, constrains population size. (This assumption is wrong. Population often grows fastest in poor countries with the least food and slowest in wealthy countries with abundant food. This fact does not seem to deter those who assume that food limits population growth.) In this method, an estimate of the maximum possible annual global food production is divided by an estimate of the minimum possible annual food requirement per person to find the maximum possible number of minimal shares that the food supply could be divided into, and this number is taken as the maximum number of people the Earth can support.

The maximum possible food production depends not only on environmental constraints like soil, rainfall, terrain, and the length of the growing season, but also on human choices, individual and collective: which plant and animal species are chosen for cultivation; the technology of cultivation; credit available to farmers; farmer education; infrastructure to produce and transport farm inputs (including irrigation capacity and hybrid seed development); infrastructure to transport, store, and process farm outputs; economic demand for food from other sectors of the economy; and international politics and markets that affect trade inputs and outputs. Culture defines what is food: where a Hindu may see a sacred cow, a non-Hindu American may see a hamburger on hooves. If edibility alone determined what is food, cockroaches would be in great demand.

The minimum food requirement depends not only on physiological requirements (2,000-2,500 kilocalories per person per day, on average for most national populations) but also on cultural and economic standards of what is acceptable and desirable. Not everyone who has a choice will accept a vegetarian diet with no more than the minimum calories and nutrients required for normal growth.

The notion of human carrying capacity is a specious metaphor from wildlife management and animal husbandry, as if humans were a herd of deer, antelopes or cattle – as if humans had no choices of what and how much to consume, of what and how much to produce, by what means and with what consequences.

Earth's capacity to support people is determined both by natural constraints, which some will emphasize, and by human choices, which others will emphasize. Many of these choices are decisions made by billions of people in their daily lives (turn off the light when you leave the room, or leave it on; wash hands before eating, or don't bother; pick up litter in the schoolyard, or add to it). The cumulative results of what may be unconscious individual actions amount to major collective human choices: consume more or less fossil fuel; spread or prevent infectious diseases; degrade or beautify the environment.

Personal and collective choices affect the average level and the distribution of material well-being; technology; political institutions governing individual liberty, change, and conflicts within and between nations; economic arrangements regarding markets, trade, employment, regulation, and non-market consequences of market activities; family size and structure, migration, care of the young and elderly, and other demographic arrangements; physical, chemical, and biological environments (do we want a world of humans and cereals only?); variability or stability; risk or robustness; the time horizon (five years ahead, or fifty, or five hundred); and values, tastes, and fashions.

I emphasize the importance of values. Values determine how parents trade off the number of their children against their children's quality of life; how they balance parents' freedom to reproduce and children's freedom to eat. Many choices that appear to be economic depend heavily on individual and cultural values. Slavery was, but is no longer, an option for economic activity. Should massive chronic and episodic hunger continue to be a permitted outcome of economic systems? Should industrial economies develop renewable energy sources, or should they keep burning fossil fuels and leave the transition to future generations? Should women (and, by symmetry, should men) work outside their homes, leaving the care of children and elderly in the hands of others? How many people the Earth can support depends in part on how many will wear cotton and how many polyester; on how many will eat beef and how many bean sprouts; on how many will want

parks and how many will want parking lots; on how many will want Jaguars (luxury sports cars) with a capital *J* and how many will want jaguars (endangered felines) with a small *j*. These choices change with time and circumstance, and so will how many people the Earth can support.

In the coming century, we, our children, and their children are less likely to face absolute limits than difficult trade-offs among aspects of population (not limited to population size, but including aging, migration, urbanization and family structure) and economic well-being and environmental quality and dearly held values. Foresight and action now might make some of the coming trade-offs easier. This perspective differs from the views of those who say that rapid population growth is no problem at all and those who say that population growth is the only problem. The facts should immunize us against both cornucopians and doomsayers.

What could be done now to facilitate future choices? The "bigger pie" school says develop more technology. The "fewer forks" school says slow or stop population growth and reduce consumption per person. The "better manners" school says improve the terms under which people interact (e.g., by defining property rights to open-access resources such as fisheries and groundwater to prevent uneconomic exploitation, removing economic irrationalities, reducing inequities and organized violence, improving governance). All these approaches have value. None is sufficient by itself. Even in combination, they will not eliminate the need to make choices among competing values.

Lack of certainty about future constraints and choices does not justify lack of action now. When I ride in a car, I put on my seatbelt, though I do not expect to be involved in a crash. We need no projections to identify problems that require action today. Today more than 200 million women of childbearing age who are in sexual unions and who say they do not want more children now lack modern means to control their fertility. As of 2013, about 124 million girls and boys of school age were out of school. Three-quarters of a billion people, more or less, were hungry yesterday, are hungry today, and will be hungry tomorrow. Humans leave their mark on the land, sea, air, and other species with which we share the planet. Yes, life is better for many people today than in the past. But yes, for many people life is more miserable than nature requires.

The real crux of the population question is the quality of people's lives: the ability of people to participate in what it means to be human; to work, play, and die with dignity; and to have some sense that one's own life has meaning and is connected with other people's lives.

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Reflections on the Current Immigration Debate in the UK

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1. INTRODUCTION: THE EU'S PRINCIPLE OF FREEDOM OF MOVEMENT

There's an extraordinary irony about the current immigration debate here in the UK. Two years ago, the UK was almost alone in pushing for far-reaching reforms to the interpretation of the EU's notionally sacrosanct principle of 'freedom of movement'. At the behest of the Tory Party's hard-line Brexiteers, the then Prime Minister, David Cameron, was humiliatingly despatched on a tour of EU

1. The views expressed in this paper are those of Jonathon Porritt and Colin Hines, in their personal capacities.

capitals to secure some small-scale (but cumulatively significant) changes in what nation states would be permitted to do to allay concerns about immigration. These were dismissed out of hand by the UK's right-wing media, which would brook no further delay in an all-or-nothing Referendum on our continued membership of the EU.

Two years on, there isn't a country in Europe where the debate about immigration isn't very live indeed – apart from the UK! Astonishingly, immigration had almost no visibility at all in the 2017 General Election campaign, and (as yet) has played only a diminished walk-on role in the current Brexit negotiations.

This new positioning across the EU was best summed up by Emmanuel Macron in his election campaign earlier in the year, arguing that asylum, refugee and migration policy "must be profoundly reformed". Since then, he's floated the idea elsewhere of a "Continental Partnership" between Britain and the EU that would allow for further restrictions on the freedom of movement whilst ensuring some kind of access to the single market. We shall examine other, equally important shifts amongst EU politicians later in this paper.

Similar changes are beginning to emerge here in the UK. As Vince Cable says, "I think you can interpret freedom of movement in a much more pragmatic way." Indeed, the makings of such an agreement are already there, including David Cameron's hard-won, pre-Referendum reforms. Perhaps most importantly, things are changing within the Labour Party, where support for such ideas is growing, bit by bit, led by Chuka Umunna, Stephen Kinnock, Stephen Doughty and many others. They point out that even today's freedom of movement is not an unconditional principle. EU citizens can be required to leave if they have no job or prospect of a job three months after arrival. Restrictions are explicitly allowed for reasons of "public policy, public security or public health", including an emergency brake if public services are being overwhelmed.

It's clear that both Labour and the Lib Dems are inching tentatively to repositioning themselves in a way that would allow them to demonstrate that they have responded to people's concerns, and are now able to address one of the biggest concerns of Brexit voters in the 2016 Referendum – namely, the imperative of being able to manage much more effectively migration from other EU countries.

2. THE CONTEXT

2.1 Facts and Perceptions

Before digging deeper into that increasingly dynamic scene, we need to establish a context – what exactly is going on that has stirred such controversy around immigration here in the UK, where the situation has changed dramatically over the last couple of decades?

In 2001, the UK population was estimated to be 59.1 million, with 4.9 million (8.3%) of foreign birth. By 2011, the population of the UK stood at 63.2 million, an increase of 4.1 million, with the foreign born population at 8 million (12.6%) (Migration Watch, 2016). By June 2016, the population of the UK had risen to around 65,648,000, an increase of 538,000 in one year (similar to the annual growth rate over the last 12 years) (ONS, 2017).

An important statistic here is the percentage of live births in England and Wales being born to mothers from outside the UK. In 1990, it was 11.6%; by 2015, that had risen to 27.5%, the highest level on record (ONS, 2016). It is estimated that net migration (the difference between those arriving in and those leaving the country in any one year), plus births to foreign-born parents, has accounted for 85% of UK population growth since 2000 (Migration Watch, 2016).

In December last year, the Office for National Statistics reported that 650,000 people migrated to the UK in the year up to June 2016, and 315,000 left, making the total net migration figure 335,000.

Between 2004 and 2016, there were around one million migrants from Eastern European countries coming to the UK. As indicated above, many end up returning to their home countries. Over 90% of international migrants to the UK go to England rather than Scotland, Wales and Northern Ireland (Migration Watch, 2016).

If net migration continues at around recent levels, then the population of the UK is expected to rise by nearly 8 million people over the next 15 years (almost the equivalent of the population of Greater London at 8.7 million), and by 9.7 million over the next 25 years, from an estimated 64.6 million in 2014 to 74.3 million in 2039. It is assumed that net migration will account for around 50% of this

projected increase over those 25 years, but 75% of this increase would be from future migration plus the children of those migrants. There is no particular reason why this level of population growth will stop there. Unless something is done to change current policy, growth is projected to increase towards 80 million in 25 years, and to keep going upwards (Office for National Statistics, 2015).

By any standards, this is a big change in the lives of a lot of UK citizens: roughly half a million new residents arriving in the UK, every year, for the last ten years. So why would anyone imagine that this kind of 'demographic disruption' would not be of concern to many people here in the UK? Much of that growth happened during the time when Labour was in power, and many former Labour Ministers have acknowledged that they simply failed to understand either the short-term impacts of such changing circumstances, or the long-term implications. And public opinion has changed a lot during that time.

> Despite uncertainties involved in measuring and interpreting public opinion, the evidence clearly shows high levels of opposition to immigration in the UK. In recent surveys, majorities of respondents think that there are too many migrants in the UK, that fewer migrants should be let in to the country, and that legal restrictions on immigration should be tighter.
>
> Immigration is ranked by people consistently among the top five issues facing the UK. As of June 2015, it was the issue picked most often by respondents (45%), followed by the NHS (40%) and the economy (26%). In the 2013 British Social Attitudes survey, large majorities endorsed reducing immigration: over 56% chose 'reduced a lot', while 77% chose either 'reduced a lot' or 'reduced a little'. Levels of concern about EU and non-EU immigration were roughly similar amongst citizens in the UK, Germany, the Netherlands, Portugal and Spain. Whereas in Greece, Italy and France, most were concerned about immigration from non-European countries (The Migration Observatory, 2016).

2.2 The Dilemma for the Progressive Left

All this poses a massive dilemma for those whose views are centre-left and generally progressive. They remain reluctant to acknowledge that large numbers of people are angry because they 'were never asked' about what would be the right level of immigration for the UK. Worse yet, they remain insensitive to the fact that this demographic disruption has been significantly exacerbated by the economic reality of many people's lives in the UK and elsewhere.

This kind of large-scale migration has occurred at a time (between 2005 and 2015) when, on average, between 65-70% of households in 25 high-income economies experienced stagnant or falling real incomes. In the USA, for instance, the median real income for full-time male workers is now lower than it was four decades ago. The income of the bottom 90% of the population has stagnated for over 30 years (Jacques, 2016). This has led (in ways that should be wholly understandable to anyone of a progressive persuasion) to growing and now chronic insecurity on the part of tens of millions of people in such countries, and particularly in the UK and the USA.

The fact that very high net levels of immigration may have had a relatively limited but broadly positive impact on the economic prospects of most people (as demonstrated by a number of reports from the Office for Budget Responsibility) is neither here nor there. What cannot be disputed is that mass immigration has cut the earning power of the unskilled:

> Mass immigration increases inequality. This is the unpalatable fact the liberal left in Britain refuses to accept. Markets are imperfect instruments. But it is not necessary to subscribe to free market economic theory to believe that large increases in supply tend to drive down the price. And the price of labour is the wage. New Labour allowed direct competition to enter the UK labour market on a scale unprecedented in our history. It is the relatively unskilled in the bottom half of the distribution who have lost out. The liberal elite do not suffer. Indeed, they benefit because many of the services they consume are provided at lower prices than would have been the case without mass immigration. It is sometimes argued that immigrants do jobs that native British workers are unwilling to take. Very well then, without mass immigration, employers would be

> obliged to raise the real wage rate to induce these people to take the jobs (Ormerod, 2015).

We would argue that there are many other and more important causes behind today's rising inequality – not least the kind of neoliberal globalisation that has dominated our economies for the last 50 years. We now know, indisputably, that a rising tide does not lift all boats. But we have to become far more sympathetic to those whose boats are now so hopelessly stuck in the toxic mud of that cruel ideology.

And here's the thing: all of that can only get a great deal worse in the future. There is absolutely no reason to suppose that the situation in the Middle East (and pre-eminently in Syria) is a kind of 'geopolitical blip' before stability returns to the region, and that migration pressures from the Middle East will therefore slow. And even less reason to suppose that population growth in many African and Middle East countries will move through the usual 'demographic transition' towards declining fertility levels.

What we do know, as a matter of increasingly painful inevitability, is that the lives of tens/hundreds of millions of people (particularly in Africa and the Middle East) will be devastated by the effects of climate change. We know that many of those people will have no choice but to leave their homes and communities if they are to have any prospect of survival, let alone a better life. And we know that many of them will seek to come to Europe, as the place that offers the best possible refuge in an all-encompassing storm that is not of their own making.

One snapshot of the potential scale of mass migration without border controls was provided by a global Gallup poll of half a million people in 154 countries (representing more than 98% of the world's adult population) that took place between 2010 to 2012. This underscored how potentially well-founded public concerns are in richer countries about uncontrolled mass migration. It showed that around 630 million of the world's adults would like to leave their country and move somewhere else permanently, with 42 million expressing a preference for the UK, a destination second only to the United States. And that's even before the impact of accelerating climate change.

3. IMPLICATIONS FOR POLITICS TODAY

Despite such a rapidly evolving context, Labour, the Lib Dems and the Greens, in the meantime, have largely stuck to a script that extolls the benefits of the EU's freedom of movement principle and of large-scale immigration, whilst choosing to downplay the disbenefits, even as the gap between them and public opinion continues to get wider. Worse yet, they have often set out to imply that any deviation from 'the script' (on the part of individuals in any of those three parties) encourages hidden racist or xenophobic tendencies, and are therefore (by definition) 'unprogressive'. In the meantime, the Conservative Party and others on the Right of the political spectrum have succeeded in using anxiety about large-scale immigration to spearhead every other aspect of today's divisive, illiberal politics.

An 'open borders' position still has strong support across the progressive spectrum. A new 'Alliance for Free Movement' was launched in February this year, demonstrating yet again that many people still apparently believe that the free movement of people provides a bulwark against unacceptable neo-liberalism, instead of seeing it for what it really is – the principal tool used by unaccountable neo-liberalism to keep wages low and workers cowed.

> The free movement of people can build our collective power and creativity in the face of attempts by the super-rich to turn the world into a gigantic marketplace, in which we are all isolated individuals competing against one another (The Alliance for Free Movement, undated).

In other words, the will of the millions of people in the UK who feel (and often are) left behind, who in no way count themselves as beneficiaries of an inherently unjust global economic system, and who want politicians to take back control by actively managing and progressively reducing immigration, alongside other critical measures, must apparently be set aside so that we can make the privileges of our still relatively wealthy country accessible to all-comers.

What lies behind this irrationality? Global inequality and its history are elegantly cited as the reason that rich countries have an apparently permanent, non-negotiable moral and legal responsibility, forever into the future, to take in economic migrants, refugees and asylum seekers. It's part of the burden of our imperial past. And that means that the push factors behind migration (war, inequality, and environmental

threats[2]) have to be tackled first, before we even begin to think about limiting the options for those escaping such destructive trends.

The irony here is telling. Many of the organisations in the vanguard of the fight against the worst excesses of today's neo-liberal globalisation are the ones that are most outspoken in favour of open borders. The fact that it is the self-same, self-serving elites that benefit most from an open borders, pro-globalisation position, goes unremarked. Open borders for capital, goods, services and people is a precondition for neo-liberalism to thrive in the EU, regardless of its impacts on individual nation states, on communities hollowed out by the loss of jobs and on thriving local economies, and on the countless individuals 'left behind' by this devil-take-the-hindmost form of capitalism. Yet still we are told that 'freedom of movement of people' is the sine qua non of progressive politics today.

The reality is that progressive politics in the UK cannot prosper unless it can call on the broad and deep support of millions of people in the UK whose values are still all about fairness, about progress (as in better lives for their communities as well as for their own families and children), and about that delicate balance between entitlements and obligations. The majority of those people believe that an 'open borders' position is demonstrably unfair, is insensitive to their understanding of what makes for cohesive, tolerant communities, and may also dilute their entitlements (particularly in terms of education, housing and social services) at a time when so many things are becoming less and less secure.

4. POTENTIAL POLITICAL FALLOUT

The current positioning around the issue of immigration of those on the Left is not consequence-free. What has to be recognised by politically active progressives in the rich countries is that if they continue to dismiss concerns about immigration as ignorant and ill-informed, or even racist and xenophobic, then the future will, without doubt, belong to the right, and even to the extreme right. The likes of Nigel Farage and Marine Le Pen have focussed ruthlessly on how to benefit from public concern about immigration, and media powerbrokers such as the *Daily Mail* have become only too adept at whipping up such sentiments.

2. The exclusion of population growth from this list is another massive blind spot for those who subscribe to the open borders position and indeed for "progressive spectrum" politics in general.

4.1 Stealing the brightest and the best

Moreover, such positioning is far from "progressive" when seen from the perspective of countries losing some of their most talented citizens as they exit to work in wealthier countries. There was a lot of concern in the UK in 2013 that the extension of freedom of movement rights to Romania and Bulgaria in 2014 would result in the arrival of masses of "beggars and benefits cheats". That didn't happen. Indeed, the reality is very different: it's the Romanian health service that is experiencing the real migration crisis, as their newly-trained doctors leave for UK and other rich countries. The number of doctors in Romanian hospitals has fallen by virtually a third from 21,400 to 14,400 since 2011 (Gillet and Taylor, 2014).

This is typical of our inability to see what the real problems are here. Britain is the world's second largest importer of health workers after the US, including more than 48,000 doctors and 86,000 nurses in 2014. While 5% of Italy's and 10% of Germany's doctors were born overseas, the figure for the UK is 26%. Incredibly, since 2000 at least 11,000 doctors in the Philippines have retrained as nurses and gone abroad, earning four or five times as much as they would as a doctor back at home (McGeown, 2014). The country provided the highest number of non-British qualified nursing, midwifery and health visiting staff, with 8,094 out of a total of 309,529 for whom data was available. The Philippines also provides the third highest number of NHS staff overall with 12,744. While the figures help illustrate the extent of the contribution of migrants, they do not paint the whole picture, as many will have taken British nationality since arriving (Siddique, 2014).

In terms of nurses, more than one third of NHS trusts went overseas to recruit nurses in the last year, with even more drawing up plans to do so now. While many NHS trusts targeted countries in Europe, several travelled thousands of miles to the Philippines, Australia, the US and India in search of staff. A main driver of this process is the shortages following the axing by NHS Trusts of thousands of nursing posts, in an attempt to find £15bn of 'efficiency savings' by 2015, leading to redundancies and freezing of posts, so that staff who retired were not replaced.

Rich countries (and the skilled migrants they attract) do indeed benefit from this permanent brain drain from poorer societies. It allows them to prop up any sectors of their economy with domestic labour shortages, and so avoid

the necessity of investing properly to train more of their own, and to pay them properly. But the negative impact in those countries from whom these highly-qualified personnel are recruited is extremely significant. In truth, stealing the brightest and the best from poor countries is the polar opposite of good, responsible internationalism.

4.2 Impact on infrastructure

If net migration continues at around recent levels, as already explained, then the UK's population is expected to rise by nearly 8 million people in 15 years, almost the equivalent of the population of Greater London (8.7 million). At least 75% of this increase would be from future migration and the children of those migrants. As already indicated, future population growth would not stop there. Unless something is done about this growth, it is projected to increase towards 80 million in 25 years and keep going upwards.

It's important to be completely logical about this. The UK is already struggling to maintain critical infrastructure, to meet housing demand, and to invest sufficiently in education, healthcare and social services. These increasingly significant deficits are not caused by high levels of immigration: they're caused by wretchedly inadequate economic and fiscal policy, going back at least a couple of decades.

But continuing population growth clearly exacerbates those deficits. The UK's Total Fertility Rate has not been above 2.1 children per mother since 1972, but 'population momentum' (the increase in the numbers of births when babies born at the peak of population growth reach reproductive age), plus net immigration, has led to a population increase of nearly 10 million people since 1972.

Beyond that, if 75% of future population growth is accounted for by immigration, rather than by any 'natural increase', these pressures will build and build, as the direct and inevitable consequence of the sheer growth in the numbers of people using the nation's infrastructure, needing proper housing, and relying on high quality education, healthcare and social services.

That is not the fault of individual immigrants – far from it. But net immigration (of around 335,000 a year over the last two years) obviously contributes to these problems.

Housing provides the most obvious example of this. The Local Government Association calculates that we need half a million new homes to avoid 'an emerging nightmare'. More than three million adults aged between 20 and 34 are now living with their parents; house prices are rising faster than average earnings, and there are at least 1.7 million households on the waiting lists for affordable homes across England. The number of people renting has doubled, and the average first-time buyer is now aged 35. This housing deficit is already causing untold social and economic damage, and there are no long-term solutions in sight.

5. DEVELOPING A MORE REALISTIC POLITICS AROUND IMMIGRATION

5.1 A Changing Scene in the EU?

Although we hear relatively little about this in the UK press, many European countries are now beginning to address exactly the same challenge: finding appropriate policy responses to the will of majorities in their countries to lessen the flow of migrants.

The previous Dutch Deputy Prime Minister, Lodewijk Asscher, has stated that "support for free movement is crumbling when people see that it turns out to be so unfair", and that Britain leaving the EU "gives a unique opportunity to do this in a very different way" (Redgrave, 2017)

Former Danish Prime Minister, Helle Thorning-Schmidt, and former Finnish Prime Minister, Alexander Stubb, have called for debates on the application of the free movement principle. The EU Commission's Vice-President, Jyrki Katainen, has talked of understanding the "unwanted consequences" of freedom of movement (Ibid.).

The Social Democrat Austrian Chancellor, Christian Kern, has called for the EU to reconsider freedom of movement rules, and in particular to consider discrimination in favour of indigenous job-seekers. He has proposed a system whereby "only if there is no suitable unemployed person in the country can [a job] be given to new arrivals without restriction" (Chance, 2013).

Nor is the European Commission deaf to these voices. It has recently tightened up its rules on access to social security, saying that Member States may decide not to grant social benefits to mobile citizens who are economically inactive, meaning those who are not working or actively looking for a job, and do not have the legal right of residence on their territory. Even in Germany, there's a profound re-think going on, with the German Bundestag in the process of introducing significant restrictions on all benefits for non-German EU citizens (Toynbee, 2017).

So why would we not be supportive of an emerging Europe-wide reinterpretation of the principle of freedom of movement? This could include some of the policies agreed by the EU 27 in 2015 during David Cameron's renegotiation; it was agreed at that time that it is legitimate for countries to take measures where an exceptional inflow of workers from elsewhere in the EU is causing serious problems to a Member State's welfare system, labour market or public services.

The Lib Dems have already moved significantly in this direction. Former UK Deputy Prime Minister, Nick Clegg, recently stated: "There are plenty of politicians across the European Union who are now volubly saying that they think there needs to be a change to freedom of movement. So there is scope for a Europe-wide approach to this which I think would satisfy some of the government's needs" (Clegg, 2017).

5.2 Beyond the EU

At the same time, it's equally important to make this stricter approach to immigration more acceptable for those living in poorer countries, by promising realistic prospects of improvement in their domestic economic and social conditions. And the crucial thing here, obviously, is to tackle the root cause of why people leave their friends and culture in the first place.

> The indigenous populations of host countries have a right to control entry, taking into account not only their own interests but also a sense of charity to others. But in exercising charity, their chief concern should be the vast group of poor people left behind in countries of origin, rather than the relatively tiny group of fortunate people who get dramatic increases in their income through being permitted to migrate (Collier, P. p.270).

Beyond the horror of war and conflict, much of this is to do with poverty and people's immediate economic prospects, or with their sense of security and personal freedom in autocratic, oppressive political circumstances. But much of this also goes back to ruthlessly imposed notions of international competitiveness, which pit nations against each other in beggar-thy-neighbour economic warfare in the global economy.

Just to repeat the point from a domestic UK position, it must be made crystal clear during the debate about optimum levels of migration, that immigrants already in the host country should be under no pressure whatsoever to leave. Indeed, both of us are supportive of immediately guaranteeing the rights of all EU citizens currently working in the UK on current terms. Every effort should be made to encourage integration in a way that promotes more harmonious communities. Such a coming together might be made easier if the future is seen to be one where communities don't have to experience future levels of the kind of unacceptably large, permanent inward migration to which they are so strongly opposed. Such a clear-cut reduction in the number of economic migrants could also mean that the public becomes more rather than less amenable to a larger number of refugees being provided with a safe haven.

Against that kind of backdrop, it becomes possible to redefine the kind of progressive internationalism that we will need for the future. All foreign policy, all trade agreements, and all aid and development transfers will need to be focussed on minimising those factors that persuade people that their chances are better off outside their country than inside. Arms sales will need to be dramatically curtailed. Aid and development policies must prioritise employment opportunities for young men and women. Education for girls and access for all women to reproductive healthcare and fertility management must take centre stage in order to help reduce population growth.

In a world where overall population growth projections are rising, and where global migration is also on the increase, it is a complete dereliction on the part of all those on the progressive Left (and of environmentalists in particular) to continue to ignore population growth and not to campaign for its reduction. Without this decrease, all solutions to other aspects of ecological and social concern are made far more difficult to deal with. This refusal to engage becomes harder and harder to explain.

The demographic link between population and immigration is really not in dispute. At the beginning of 2012, the population of Europe was estimated at 503.7 million, an increase of more than 100 million since 1960. In 2011, around 68% of Europe's population growth came from net migration, which continues to be the main determinant of population growth as it has been since 1992. Given the ageing population in Europe, future population decline or growth will depend primarily on the contribution made by migration (Eurostat, 2017).

Continued global population growth is inevitable for the next few decades, but whether it continues in the longer term will be determined by the policy goals of nation states and the international community, as well as the resources allocated to ensure these policies are implemented successfully. The longer the delay in adequately focussing on the need to reduce population growth, the more momentum is built into the system for a continued increase in human numbers.

So let us end with one more round of inconvenient statistics. In 2016, world population was estimated to be 7.4 billion (Population Reference Bureau, 2016). Currently, it continues to grow, although more slowly than in the recent past. However, it is still rising by approximately 83 million people per year. According to the 2017 United Nations World Population Prospects Report, world population is projected to increase by more than one billion people within the next 15 years, reaching 8.6 billion people in 2030, increasing further to 9.8 billion in 2050, and to as much as 11.2 billion by 2100 (UN, 2015).

This 2100 figure represents a projected increase of nearly 300 million as compared with its 2012 report, which had a "medium-variant projection"[3] of 10.9 billion by 2100 (UN, 2017). This in turn was an increase of 800 million over the projections just two years before, in 2010, that the world population at the end of the century would stand at 10.1 billion (UN, 2011, page xvi). In other words, the UN world population projections for 2100 have increased, over the last six years, by over a billion people, from 10.1 to 11.2 billion.

This is a completely surreal situation in which we now find ourselves, and one which deserves far more attention from politicians of <u>all</u> parties.

3. The UN's "medium-variant projection" assumes a decline in fertility in those countries where large families are prevalent, but also a small increase in fertility in countries with a fertility rate of less than 2.

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Beyond the one-child policy: a response to Conly

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Abstract

The problems with Conly's proposed 'one-child' policy are a good example of where the attempt to limit paternalism becomes self-defeating, and actually ends up potentially aiding the case against controlling population rather than promoting it, as well as negatively influencing the debate about paternalism more generally. There are many better potential ways of developing public policy towards population control than a 'one-child' policy that synchronise with richer ways to understand individual interests.

Keywords:

One child policy; coercive paternalism; reproductive ethics; reproductive autonomy; liberal individualism.

One child, many objections

Should a 'one-child policy' be advocated as a global norm to combat population growth and environmental threats, as suggested by Conly (2016, 2016a)? Conly suggests that public policy should be directed against the inalienable right to have more than one child. "The limitation to one child", she suggests, "means that *two people who procreate should limit themselves to one child between them*" (Conly, 2016:2, my italics). The objective of this response is not to challenge,

or support, the fundamental case for population control. It is simply to identify the philosophical underpinnings and associated problems for this particular proposed form of the solution, and provide alternatives.

The first problem with Conly's formulation is that *it is not clear who has or should lose this presumed right*. Despite what at first sight appears to be an entirely biological definition, at varying points in the article she refers to the entity with rights as a 'couple' (Conly, 2016a:27), and a 'family' (Conly, 2016a:29) and sometimes just 'you' (Conly, 2016a:29). A 'couple', or a 'family' is not, in many cultures, a permanent or even particularly persistent state. Serial monogomy, or something like it, is quite common in many societies, and has been for millennia. Fluid relationships between parents, which are now common in many societies, certainly increase the social difficulties of a one-child policy. Already in US law, for example, the legal definition of family is being extended to include three or more parents (Lewis, 2016).

But apart from observed historical difficulties in execution, and questions over whether the policy should be one child per couple or two, as advocated by Jing (2013), in fact, *the very notion of two people creating one child biologically is already outdated*, which over time will progressively invalidate Conly's 'one child between them' formulation. There is already legal recognition of 'three person parenting' in the UK, following the passing of an amendment to the 2008 Human Fertilisation and Embryology Act which permits IVF techniques aimed at preventing serious inherited mitochondrial disease (Tingley, 2014). This may be the beginning of progressively more genetic intervention, all of which will increase the number of people who are genetically involved, in however limited a fashion, with the creation of a child, a process that has been described as 'inevitable' even by a critic of the resources devoted to it (Baylis, 2013:534). The ultimate destination of such medical practice can easily be conceived as an N-parent child, where N could be some very large number. Aside from any ethical objections to multiple biological parenting, what rational formula could be devised relating the number of children produced to the number of parents? If person X contributed 1% of the DNA of a child, would this give them 49% remaining to 'spend'? It is hard to imagine that following this approach could lead to any politically acceptable public policy, and still harder to imagine the social utility of such a process.

Finally, the social consequences a one-child policy poses for even a relatively traditional society as a whole have been well-documented, with China as a practical example (Hesketh et al, 2005, Whyte et al, 2015). The policy has led to gender imbalance amongst many other problems such as evasion, bribery, contorted and progressively more complex structures of exceptions (e.g. allowing a second child if both parents are themselves single children), and a dependence on fines for local income (Jing, 2013). In the forthright words of prominent critics, 'It is a policy that has forcefully altered family and kinship for many Chinese, has contributed to an unbalanced sex ratio at birth, and has produced effects that will be felt for generations, with its burden falling disproportionately on those many couples who were forced to have one child' (Feng et al, 2012:123). Similar, but attenuated, issues will likely continue with a two-child policy. The problems with administering any such policy amid fluid family structures would be still greater. Talking, as Conly does, of tax breaks for one-child families and indeed any approach utilising tax policy for example confines policy to those earning, which misses a significant chunk of global population, whilst changes to benefits may impact adversely on children who were not individually responsible for their situation.

Perhaps the policy could be softened to one child per individual, or even one per *woman*, which is at least much more easily monitored and controlled, and would take the sting out of several of the adverse social consequences noted in China. But this would not be a 'one child policy' as conventionally understood, it has nothing to do with couples, serial, permanent or otherwise, it does not make anything like the same contribution to curbing population, and is still open to the genetic criticism. It is also blatantly sexist in the latter formulation, and would obviously produce a panoply of personal and social problems itself, for example in regard to serial monogomy and similar family structures.

The underlying philosophy

Given the evident difficulties with the one-child policy, the question arises, is there perhaps an underlying reason why Conly has chosen to formulate policy in this particular way? More specifically, is there a philosophical underpinning for her work that circumscribes her formulation of a solution to the population problem? To answer this, it is necessary to turn to her earlier work where she develops a more general argument against individual autonomy and in favour of what she describes as coercive paternalism, the view that we may and are

sometimes morally obligated to force people not to do some things and to do others (Conly, 2012:18). By which she means, force people to act *in their own interests*. Throughout her thinking (and still more those of her critics who advocate much weaker forms of population control with less interference with personal autonomy, such as Rieder (2016)), runs the assumption that individual objectives and interests – what she calls 'better living' (Conly, 2012: 17) - can be identified, analysed, and supported through government actions. She goes further, identifying an entire sphere of activity, what she calls 'personal life' (Conly, 2012:17) where she believes coercive paternalism should intervene. She does recognise that many government regulations are aimed at alleviating distress and improving the lives of others, not the perpetrators, but she excludes these decisions from her definition of paternalism, which rests, it seems, on a very clear distinction between 'your' interests and 'mine'.

Conly's position in favour of control over this identified zone where, in her view, individual freedom is ethically acceptable is based on the interpretation by authorities of individual long-term goals. She makes a presumption that these individual goals are sufficiently tolerable and not in conflict with one another – at least in any significant and permanent sense. For Conly, the only problem lies in informational asymmetry which results in failures to select the most cost-effective and appropriate means to achieve them: in particular, as she recognises (Conly, 2012:22) and others have argued at length, failures caused by impatience and an inability to calculate a 'rational' rate of discounting the future (Loewenstein, 2010:xi). This can be alleviated, at least, by government interference and control. The stress on individuals and goals within a liberal democracy is what results in Conly's formulation of a one-child policy: the policy must in her view ultimately address and compromise with individual autonomy, rights, and decisions.

The admitted aim of Conly's coercive paternalism is therefore to enable individuals to become better decision-makers in their *own* interests, not to reformulate individual interests in a wider, more communitarian sense. There are two types of objection to this straightforward position, which as noted above contains so many liberal assumptions about individuality.

First, there are already plenty of examples where decision-making does not devolve onto individuals. One of the most obvious is a hierarchical organisation such as

a military unit: risks are allocated to individuals on the basis of such conditions as temporary geographic location, utility to the unit as a whole, and speed of reaction: individuals are not given choices about which risks to undertake. The effectiveness of the unit as a whole would be crippled if individuals were allowed this kind of autonomy. Similar examples abound from commerce, politics and social life generally. Yet in a world facing what Conly herself regards as an immense environmental crisis generated in significant part by population pressure, she cannot bring herself to detach from an ideological framework that continues to rely on the liberal idea of the individual and amorphous 'couples' generated by individuals as the appropriate unit for the location of population control.

Second, there are plenty of alternative ideas of individuality to which it would be possible to turn as an alternative philosophical underpinning and which would not require devolution of the population control regulatory process – whether ethically or practically – onto biological parents at all. This scholarship recognises that the idea of vesting rights in individuals is an historical phenomenon associated with the development of capitalism, not some innate aspect of philosophical discussion. Writers such as Oshana (2006) – referred to in passing by Conly – Nedelsky (2011), and many others, have developed a nuanced view of individuality as relational, viewing persons as socially embedded and recognising that agents' identities, and the decisions that they make, are formed within the context of social relationships and shaped by a complex of intersecting social determinants, such as race, class, gender, and ethnicity (Mackenzie & Stoljar, 2000:4). A simple example relating to Conly's own work would be the point that decisions about smoking and obesity are well-known to be linked to social class and identity (Barbeau et al, 2004), a fact that Conly herself relegates to a footnote with the surely awkward, and certainly contentious, deduction from the fact that men smoke more than do women, that there is no evidence that one group is generally better able to avoid cognitive bias than another (Conly, 2012: 38fn). At the very least this argument needs much more detailed support. If it is incorrect, as relational theorists would generally agree, it follows that individuals are not always best placed to express their own interests, as she expressly says (Conly, 2012:36). These communitarian views, which owe much to feminist scholarship but which also echo Marx, are strongly in accord with the type of practical development in law noted above (Lewis, 2016) and have obvious significance for policy-making, especially in respect to the kinds of poor decision-making that Conly wants to stress are a strong argument for coercive paternalism.

With a relational view of individuality substituted for the liberal view that underlies Conly's work, coercive paternalism can be embraced more fully and more plausible policy options can be contemplated. Specifically, in relation to having children, an understanding of relational individuality can be extended to the recognition that individuals may be prevented by what some Marxists would call 'false consciousness' (Eyerman, 1981) and which others might describe less scientifically as selfishness, short-sightedness or a form of subconscious biological determinism, to overvalue (and over-invest in) their own biological children at the expense of children more generally. This set of views may be tolerated in a world in which population control is not perceived as necessary. But just as similar misguided individualistic viewpoints must be jettisoned in order for organisations to work – for example the longstanding view that women should not work in factories was conveniently set aside during World War I – so effective population control may actually rely on this change in underlying philosophical perceptions about individuality and individual interests.

None of this is meant to suggest that a wider perception of the way in which having children infringes on others' rights (or at least their interests, of which having more children can be seen as a related or extended problem) is not capable of radically altering the ethical perception of reproduction. Many years ago, Peter Singer put the powerful argument that if individuals in rich, advanced Western countries are able to assist the less fortunate in developing countries, there is a clear and present moral imperative on them to do so. This obligation stands regardless of the diminution in their own welfare – and implicitly, those of their families, including their children – not least because there is no morally significant difference between killing and allowing to die, irrespective of distance, either in time or space. There is no moral justification, Singer suggested, in separating out any particular individual to help (Singer, 1972).

By focusing exclusively on coercive paternalism in relation to individual interests in the liberal, individualist sense, Conly implies the opposite of Singer's position: ie that the choices we make are about *'our'* children, for whom we bear some special responsibility *at the expense of others*. Conly's liberal individualism is therefore likely to militate against any convergence between her position and that proposed by Singer, and arguably to reduce the power of her argument to effect social change. The message here is that by changing the philosophical underpinning the door opens to different policy options.

The Big Objection

Conly rightly recognises the criticisms levelled against coercive paternalism by liberals and other individualists that intervention in personal lives, such as the control of population, are the beginning of a slippery slope towards some kind of deeply objectionable form of government with widespread misuse of authority and much greater injustice. Once again, my intention here is not to add to the case in support of coercive paternalism in general: she herself advances many, I contend, convincing arguments against this line of criticism (Conly, 2012). Nor is it to engage in the wider debate of the extent to which population control is in conflict with liberal values of freedom, except to observe in passing that it shares this potential conflict with many other regulatory and legislative controls over individual freedom of action.

It is however to suggest much more narrowly that critics of coercive paternalism are actually strengthened in their argument by the way Conly advocates legislation and regulation should be aimed at individuals and couples. Conly's approach neither encompasses a wide societal agreement on the need to control population, nor does it entail a perception of a collective moral obligation to act. Conly does identify the criticism that individuals become 'inauthentic' if they adopt social standards without a well-considered estimation of their value (Conly, 2012:80). But just as Conly argues that libertarian paternalism is less likely to succeed than coercive paternalism, so I would stretch the argument further to contend that coercive paternalism itself needs to be applied across society in a democratic way, involving concepts such as fairness and justice in the design of policy, to give it a better chance of success and to repel the criticism of individual inauthenticity. Authentic citizens are those who actively participate in the democratic process, which definitely includes big societal choices with numerous variables such as population control. As Conly herself says, the point is not to avoid paternalistic legislation, but to legislate properly (Conly, 2012:101).

Alternative Solutions

If society is to move towards a coherent population policy, it will be necessary to focus much more on desirable outcomes for children and much less on the liberal concept of the individual and their rights that permeates Conly's approach. There are many ways that the politics and economics of population control could be administered whilst still retaining the circumscription of behaviour and focus on legislation and regulation explicit in coercive paternalism.

No particular political ideology will in practice necessarily be crowded out from participation in the public policy process on such an important topic to the extent that supporters of opposing political standpoints might agree on the need for a solution to the problem, but disagree on the formulation of appropriate policy. So, for example, whereas Manning (2016:23) implicitly criticises any market measures, market apologists might advocate precisely a system of bids for reproductive licences, akin for example to the Singapore system of Certificates of Entitlement for automobile ownership. Citizens pay what in other countries would be regarded as exorbitant sums for licences to own and drive cars, in order to control what would otherwise swiftly become total gridlock on the city's roads (Land Transport Authority of Singapore, 2017). Obviously such a system would require careful working out and colossal administration, and would no doubt generate loopholes, evasion and other immense problems and complexities of its own, as money is clearly not the only prerequisite for a successful life. But such a type of solution is neither impossible nor unimaginable in a world that has embraced market solutions for problems that even a generation ago would have seemed inconceivable. So far, reproductive rights have been exercised independently of capitalist exchange, but their incorporation might even – paradoxically for free marketeers – spur greater debate about the equitable distribution of financial resources within societies. Those who oppose market solutions would likewise advocate administrative solutions to the issue of population control, probably favouring some system of rules that attempted to create as 'fair' a structure as possible across all socio-economic levels with the maximum possible set of desirable opportunities and outcomes for the children of the future, and the minimum amount of invasive punishment for breaking the rules. Similar policy rules after all apply now to immigration worldwide, which would have been unthinkable a century ago when travellers and immigrants formed an extremely small cohort amongst all resident populations. Critics would of course likewise point to evasion, as with rich Chinese giving birth in a foreign country to evade the one-child policy (Jing, 2013).

What if the system eventually adopted were to resemble how most societies worldwide have solved the distribution of health and education resources? The outcome would be a combination of the two systems, with both private licences and a state scheme in operation, the two together fitting into a general plan for population control agreed democratically, subject to regularly reviewed

sanctions and incentives, and all subject to periodic review. Perhaps a suitably modified licensing system – public buses, school buses and emergency vehicles are exempted from the Singapore COE – might well form the direction in which public policy eventually moves.

No one of these policy frameworks therefore can be decided upon in advance, especially in a democratic context. Nor is it to argue that implementation would be easy or swift, even in an advanced industrial society, let alone in a developing country context. Most importantly, *any* of these solutions would be highly likely to have a better social outcome, rather than trying to administer a system which bases the 'right' to have children entirely on the individual and a restriction in their own alleged liberty.

Conclusion

Conly puts forward no satisfactory reason why the supremely social issue of population control should be determined by a decision of an individual or a couple, whilst her arguments rest on a particular concept of the individual and their ability to identify their own interests. Given developments in reproductive technology, as well as social change, if any control at all is to exist it may eventually be inevitable for society as a whole to take charge of the process and produce a plan for sustainable population growth. This would evidently have to take cognisance of and be integrated with issues such as immigration, social integration, the age distribution of the population present and future, and other issues. It would be an extremely complicated plan, and no doubt there would be exceptions, problems, abuse and offences against the resultant laws, as there have been against every law ever introduced. But it is a more rational and surely a more likely eventual outcome than some formula based on an arithmetic relationship between N parents and their rights or otherwise to produce a child. In sum, the one-child (or two-child) policy is a dead-end. Society needs a better approach and a more accurate, and nuanced, concept of individuality to underlie it.

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Food Scarcity. Unavoidable by 2100? Impact of Demography & Climate Change

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Scientific studies that examine the food supply and its correlation to human population have a long tradition extending back to Thomas Malthus and his *Essay on the Principle of Population* of 1798. From then on, the field has remained politically charged. Still today, Malthus is often dismissed as a doomsday prophet whose apocalyptic predictions turned out to be wrong. But Malthus lacked the modern concept of "overshoot and collapse" and he never predicted the kind of population crashes that we associate with modern famines (Kolb, 1972; Bardi, 2016). Another study often accused of having been overly alarmist in terms of the future of the human population is the Club of Rome's *The Limits to Growth*, first published in 1972. This is also a misinterpretation, since none of the several scenarios reported in 1972 foresaw a population decline before entering the second half of the 21st century (Bardi, 2011).

Of course, there are also counter-examples showing that it is perfectly possible to make wrong predictions about the future of the food supply. For instance, in 1968 Paul Ehrlich (1968) wrote that widespread famines would afflict humankind in the 1970s and 1980s. On the contrary, the 1980s saw the start of a historical phase in which no major famines were recorded for at least three decades (Penuel and Statler, 2011), yet despite this hunger still persists in the world.

These considerations are meant to show how difficult the subject of food supply is and how easy it is to let politically charged considerations bend the results of a study to fit preconceived views of the world. So, it takes a certain courage to

venture in this field, but nevertheless it is an important subject which needs to be faced. The authors of *Food Scarcity*, Raul Weller and Kris Demuynck, have done exactly that with their book dedicated to the central subject pursued by the Club of Rome: the future of humankind. Weller is a member of the Club while the study is sponsored by the Club's EU chapter. Analogous to the first report to the Club of Rome, *The Limits to Growth*, of 1972, the book by Weiler and Demuynck approaches an old problem with a new methodology. While *The Limits to Growth* was one of the first studies to apply system dynamics to the study of the economy, *Food Scarcity* is among the first study to apply modern network theory to the world's food system – a subject also approached earlier by Zimmerman et al. (2016), but not on such a wide scale.

The resulting book, *Food Scarcity*, is an ambitious attempt to pack an enormous amount of material into just 150 pages. It starts with a review of the situation of the world's food supply with extensive data on the different climate systems, cultivation technologies, geographical conditions, and more. It then proceeds to an analysis based on modern network theory, where the authors describe the correlations between the various ecosystemic, geographic, and climatic elements of the system. The subsequent section considers various perspectives on current techniques of food production. Finally, the book provides a set of recommendations for the future.

The depth and the breadth of the analysis attempted by the authors is impressive but, at the same time, the book gives the impression of not having been completely successful in tackling the title subject of *Food Scarcity*. The book targets many important elements of the world's *food production* system, including climate change, soil erosion, technological effects and others, but it does not include some which are fundamental to the subject of *food supply*, which is not the same thing as *food production*. In particular, there is no mention of the importance of the financial system in the issue of feeding the world's population. In ignoring financial factors, *Food Scarcity* follows the approach that was previously taken by the authors of *The Limits to Growth* – which may be considered a necessity given the many unknowns generating the wide fluctuations of the financial markets. Yet, in dealing with food supply at the global level we cannot ignore how the fact that large famines disappeared for the past 40 years rests only in part on the increased yield of agriculture. Another major factor, perhaps the most important one, has been the capability of the world's commercial system to deliver food everywhere.

However, food is delivered because people are able to buy it, otherwise it would rot where it is produced. A global financial crisis, such as the one that took place in 2008, could cause major famines if it were to last more than a few years. So, it is disappointing to read the nine "Recommendations" of the book, all based on suggestions of how to increase food production, or at least avoid its decline (e.g., avoid producing biofuels). These are all good suggestions, albeit perhaps temporary ones, but none of them mention factors related to delivering food where it is needed. One problem here is that we are still at an early stage in understanding what makes complex networks resistant to external perturbations, and we are unable to predict how and when a complex system will crash, even though crashing is a typical property of these systems (Bardi, 2017).

This book can be seen as an important first step in using network theory for understanding a major sector of the world's economy, that of food production and supply. But it is only a first step, and much more work will be needed to be able to manage the world's food supply system in a way that will make humankind truly safe from famines.

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