

Humankind's relationship with nature



**ASSIGN
BUSTER**

Eating, For Humans

or, Finding A Better Way to Think About Humankind's Relation to Nature

When the ship first sank, there were four who made it onto the lifeboat. The boy, the boy's mother, a French chef, and a Chinese sailor. The French chef was a brute. In a "holy terror of hunger" (the boy's words), the chef spent the first day catching and eating flies, even though the lifeboat had food supplies to last for weeks. When the Chinese sailor became ill, the French chef killed him and cut up his body for fishing bait. If there were no fish, the chef would eat the bait. Eventually, when the boy and his mother were weak, the chef killed and ate the boy's mother.

The next day the boy and the chef were sitting opposite each other, with a knife between them. The boy picked up the knife, and – this is how he describes the scene:

"We fought and I killed him. He had no expression on his face, neither of despair nor of anger, neither of fear nor of pain. He gave up. He let himself be killed, though it was still a struggle ... He had gone too far and now he didn't want to go on living any more." [1]

The boy's name was Pi. When he reached shore, 227 days after the shipwreck, he would tell everybody that he survived on the lifeboat with an adult Bengal tiger.

The question of food security has always been about humankind's relationship with nature, which is to say that it is about how humankind perceives its relation to nature. In the last few hundred years, two ways of

<https://assignbuster.com/humankinds-relationship-with-nature/>

thinking about humanity's relationship with nature and food have become dominant. The first sees humankind perennially at the beginning of a global food catastrophe. The second laughs at the thought of food shortages; hunger, to the second school of thought, is something to be overcome through invention and innovation.

You may be more familiar with first school of thought under the heading of "environmentalism", or, as one demographer has called it, "apocalyptic environmentalism". [2] The science writer Charles C. Mann labels the first group the 'Prophets'. [3] The core claim of the Prophets is that unless we do something to drastically cut back our consumption of natural resources, our growing population and appetites will soon deplete the ecosystem and leave Earth unable to support human life.

The most influential early Prophet was Thomas Robert Malthus, who in 1798 wrote about the mathematical inevitability of mass famine. According to Malthus, agricultural production grows arithmetically (2, 3, 4), whereas population growth is geometric (2, 4, 8) - meaning that population growth will always leapfrog food availability, before that growth is "checked" by lack of sustenance ("checked" apparently being the grim English slang for mass starvation). [4]

There have been Malthusian-style Prophets in each generation: William Crookes, a chemist, rang alarm bells in 1898 about the world's dwindling supply of nitrogen, and predicted that the world had three decades before it ran out of bread. [5] William Vogt published *Road to Survival* in 1948, in which he argued that *even if* we somehow manage to grow enough food to feed

the growing population, the effort will make the planet uninhabitable.[6]In quick succession, Paul Ehrlich published *The Population Bomb* in 1968 (in which he argued that humanity was “ breed[ing] itself into oblivion”),[7]and a group of economists and computer scientists published *The Limits to Growth* in 1972 (their model of the world’s resources gave about a hundred years until catastrophe).[8]There are many other names: Mark Hertsgaard, Julian Cribb, Al Gore... Each time the message of the Prophets is the same: use less, or else.

If you’re reading this, then chances are that the Prophets’ predictions of catastrophic collapse have yet to come true. This delay in the doomsday countdown has a lot to do with the second school of thought, often called “ techno-optimists”, and whom we will call the ‘ Wizards’. Where Prophets see natural limitations, Wizards see a challenge. To them, our resources are not running out: we just haven’t yet invented new ways to consume those resources most efficiently.

The founding creed of the Wizards could be a statement from William Godwin, who wrote in *Of Population* (1820) that “[H]e must be a literal and most uninventive speculator, who would attempt to set bounds to the physical powers of the earth to supply the means of human subsistence.” [9] Godwin’s book was written as a direct response to Malthus; perhaps the first clash between Wizard and Prophet, a pattern that has been repeated throughout the intervening centuries. For example, Crookes’s warning over nitrogen and wheat shortages was answered a decade later by the German scientist Fritz Haber, who discovered how to draw nitrogen from the air in order to create synthetic fertilizer. It has been estimated that the Haber-

<https://assignbuster.com/humankinds-relationship-with-nature/>

Bosch process, as it came to be known, is today responsible for the diets of 45% of the world's population: over 3 billion people.[10]One physicist put it well: Haber, he said, discovered how to “ turn air into bread.” [11]

Another famous Wizard was the agriculturalist Norman Borlaug, who, at the same time that Vogt wrote *Road to Survival* , was successfully breeding a new strain of “ semi-dwarf” wheat. This new wheat, when heavily fertilized, turned its growth into more grain rather than longer stalks. Borlaug's innovation (and the other high-yield crops it inspired) has today more than doubled the world's annual production of cereals – an increase so large it has been nicknamed ‘ The Green Revolution’.[12]

Like the Prophets, there have been Wizards in each generation, and the Wizard/Prophet clash is a pattern that has recurred throughout history, and will continue to recur: the Prophets making predictable predictions of collapse, and the Wizards pulling a cooked rabbit out of a hat.

To cut back or to innovate? I don't propose to resolve the clash between the Wizards and the Prophets, nor do I think that the clash *can* be resolved in any meaningful way. The disagreement is not between two ideas. At heart, the two sides are disagreeing over an empirical question, namely: at what point will humankind overstep Earth's natural limits? (In the parlance: what is the carrying capacity of the Earth?) For Prophets, natural limits loom near in the future, sometimes within decades. It might seem that Wizards, with their insistence on the indefatigability of human genius, reject the concept of natural limitations altogether. The better view, however, is to see their position as the belief that human innovation can push natural limits back so

far that those limits become irrelevant. One Wizard, Warren Weaver (a director at the Rockefeller Foundation from 1932-55, most famous as the man who funded Borlaug and the Green Revolution) once theorised that if the United States utilised its available resources with maximum efficiency then it could support a population of 80 billion people. ^[13] The difference between Wizards and Prophets is in their predictions about where Earth's natural limits will fall: soon, or so far away it is of no concern.

When you understand that the longstanding Wizard/Prophet clash is essentially a technical argument over the extent of Earth's carrying capacity, the clash comes to seem... lacking. What seemed at first to be two different ways to conceive of humanity's relationship with nature turns out to put humanity in a fixed role, and not an especially complex one. What the Wizards and the Prophets are doing, in their own ways, is attempting to balance the human spreadsheet, to ensure that food supply equals food demand. Yet to keep food production within Earth's carrying capacity is to do no more than to avoid dire catastrophe; it is to assume that the aim of humankind is *aggregate survival of the species* and no more. Environmental scholars call this a "deep ecological" view of humanity – the view that human beings are essentially just another organism.^[14] *Survival* is something done by humans and bacteria alike.

This "deep ecological" view of humankind has a very specific origin. When Charles Darwin published *The Origin of Species* in 1859, the realisation that humans were shaped by the same non-divine natural forces as other animals re-oriented, almost overnight, the way we thought about our place in the universe. This paradigmatic realignment has been referred to as a second

<https://assignbuster.com/humankinds-relationship-with-nature/>

Copernican Revolution.[15]In the first Copernican Revolution, when Copernicus demonstrated that Earth revolves around the sun, it became clear that our planet held no special place in the cosmos. With this second revolution, it became clear that humans held no special place in nature.

There was religious resistance to this view, as is to be expected: in a famous 1860 Oxford debate, Bishop Wilberforce of the Church of England mocked the Darwinist view and denied that humans were merely “ overachieving mushrooms”.[16]But Wilberforce has been overruled by history; it is the deep ecological view of humanity that has won out.[17]It is this view of humanity - as nothing more special than a successful organism - which today forms the intellectual background for our discussions about feeding humankind.

Is this such a bad thing? Does it matter that the advocates and architects of food production are happy to view humans as the metaphysical equivalent of precocious fungi? That they operate within a paradigm where survival is the ultimate ends of humanity?

Before I go on, I should clarify that I don't dispute that survival, in the form of continuing reproduction and guaranteeing future nutrition, is undoubtedly a primary goal of human existence; after all, it underpins all other human endeavour. My point, rather, is that to act and plan as if survival is the main purpose of human existence is both misguided and misleading.

Very little investigation is required to see that humankind's production of food is not determined solely by the requirements of survival. Look no further than the fact that an estimated third of all food is wasted. [18] Wasted
<https://assignbuster.com/humankinds-relationship-with-nature/>

food is wasted effort, and wasted effort is inimical to survival. Why overproduce food? Why overshoot what is necessary when to do so is harmful?

At least part of the answer is that we are stuck in an artificial feedback loop *created by the very notion that our purpose for existence is continued survival*. 'Survival' is a slippery ambition, one that could have infinite steps taken towards its achievement. Consider: when stocking a nuclear bunker, how much food should you store? 10 cans of beans? 100? 1, 000, 000? Should you pack weapons? Which medicines should you stockpile? How much of each medicine? To aim at survival is to aim at something elusive yet endlessly demanding, and "ill-defined ends seem, in their vagueness, always to require more resources." ^[19] So it is when 'survival' is the sole aim of food production: more food is produced than is needed; further innovation is always required; the dials of production are constantly turned to maximum. It is not too much to say that food production is no longer about eating. Food production in the developed world today is really about the creation of a (false) buffer between humans and their mortality: what the modern food economy is producing is not food, but comfort food.

The comfort will be short-lived, as the feedback loop of fear and overproduction goes for another cycle. Our illusions of security are regularly shattered by realisations that our relentless pursuit of innovation has actually aggravated the problems of resource scarcity. For example, the reliance on synthetic fertilizers that made the growth in the 20th century possible has now created the risk that nitrogen-rich phosphorous reserves may be depleted, in what has been called "the gravest natural resource

<https://assignbuster.com/humankinds-relationship-with-nature/>

shortage you've never heard of.”[20] Fertilizer run-off has contaminated water basins, and larger populations have meant more of the remaining available water is being used in cities, which means less for agriculture. Meanwhile, the creation of genetically modified foods may have created foods that are actually *less* nutritious, leading to the historical anomaly of overweight yet undernourished people.[21] Even for non-GM foods, the over-farming of land has led to the depletion of essential minerals in the soil, such that we would need to eat five cauliflowers today to get the same minerals as our grandparents would have got from just one, a hundred years ago. [22] Blanketing all of these problems is climate change, accelerating the depletion of resources and land, and disrupting the stable climates needed for agriculture.

Of course, the Wizards are spurred on to further innovation every time the Prophets augur doom, with the interplay between the two sides of survivalists only guaranteeing that we barrel ahead at a faster rate. In our “holy terror of hunger”, humankind is engaged in an orgy of production and consumption, and the result is an increasingly debauched Earth.

In our urgency, in our fear, humankind has thought itself into a frenzy of overproduction. But the silver lining, the reason I mention the storm clouds, is this: if humanity can think itself into overproduction, that means we can think our way out of it.

I began this essay with the notion that the question of food security is, at its core, about humankind's relationship with nature. Will nature support us forever? How can humankind evade natural limitations? Will we be like all

other successful organisms, breeding ourselves into collapse?[23]How do we survive that fate? All of these questions can be reduced to one simple question - the " great question", in the words of conservationist George Perkins Marsh - of " whether man is *of* nature or *above* her." [24]

The Wizards and Prophets come down firmly on the former position, the deep ecological view of humankind. Human beings, to them, are no more complicated than bacteria, eating to survive and surviving to eat. [25] To believe humans are *of* nature is to equate us with the cannibalistic French chef in *The Life of Pi* . Terrified of hunger, we grab at what food we can, no matter if it is necessary to our survival or not. But in the indiscriminate eating, the single-minded focus on survival, we lose what it means to be human in the first place.

The Life of Pi is a novel about the choice of belief. When investigators question Pi about the sinking of their cargo ship, he tells them two versions of his survival story - one with the cannibalistic chef, and the other with the Bengal tiger. As the investigators get up to leave, Pi asks them: " since it makes no factual difference to you and you can't prove the question either way, which story do you prefer?"

Mr. Okamoto: " That's an interesting question..."

Mr. Chiba: " The story with the animals."

Mr. Okamoto: " Yes. The story with the animals is a better story." [26]

We have a choice in how to view humanity's relationship with nature. When we treat life as a mere technical challenge - food in, babies out - that is what <https://assignbuster.com/humankinds-relationship-with-nature/>

it will become. Instead we must *choose to believe* that humankind is above nature. Why would we do this? Why, when science has been so successful in showing us that the human can be reduced to its physical components; why go against the weight of evidence?

I admit that my reasoning is less than scientific. When I read a line like “ the purpose of human existence is survival” some part of me shudders. *That can't be it*, I think. Life must be more than nutrition and procreation. Like Mr. Okamoto and Mr. Chiba, I prefer to believe the better story.

Before I can be accused of artfully dodging the question at hand - the question of food security - I should say what my argument means in practice. Put simply, it means we need a richer way of thinking about human endeavour. Our questions must not start with *How* (how do we make our resources stretch? how do we maximise production? how do we survive?), but *Why*. Why do we produce food? Why feed the future billions? To believe that human beings are more than mere organisms is to be constantly asking some version of this purposive question.

For example, why do we produce food? The proper purpose of agriculture should be to allow people - present and future - to eat and, moreover, to not have to worry about going hungry. There is a human rights element to this answer; we want to ensure nutrition so that people are free to choose their own lives and pursue higher aims without being constrained by ill-health or lack of energy. Agriculture exists to put us *above* nature, to secure nutrition so that each of us can focus on life. Why, then, are 815 million people undernourished today? ^[27] If we value human beings as more than just

organisms or carriers of human DNA, then we ought to do all we can to ensure the freedoms that make a life into a human life. For the 815 million undernourished, this means ensuring access to adequate food – not through producing more food, but (as decades of experts attest) by ensuring the most vulnerable have enough income to buy food. The problem of hunger is not lack of food but inadequate distribution, and the greatest barrier to distribution is poverty.[28]When you look at food production not in the aggregate but as something that affects the lives of real people, it becomes clear that all food planning, present and future, must take into account income distribution.

What about the question of how to secure food for the exponentially growing population? There is a prior question: why grow the population in the first place? I have yet to see a good argument for why a population of 10 billion people is preferable to the current 7.6 billion people, when the main outcome of a growing population is more acute environmental hardship for a greater number of people. And yet, the current rhetoric assumes that population growth is inevitable; a natural fact, out of our hands.[29]

Population growth rates are *not* out of our hands. We seem to forget that population need not grow at all, especially not since the invention of modern contraception. Technology has made us free to choose if and when to reproduce – it is now up to us to learn to enjoy that freedom. In so doing, we must be guided not by the biological impulse to maximise our chances of survival, but rather by aims we choose ourselves, either individually or collectively.

One problem, however, is that the achievement of contraception is not universal. The World Health Organisation estimates that 214 million women in developing countries do not want to conceive but have no access to birth control.[30] Like access to food, access to contraception should be distributed universally to allow all people the ability to define their own version of the good life – or, if necessary, to allow governments to effectively set population targets.[31] A flow-on benefit of universal distribution is that access to birth control often lowers the frequency of pregnancy, which in turn lowers maternal mortality rates and correlates with better health and education for children, all while reducing population strain.[32]

CODA

I want to end on another story, this one from the New Testament. It is the scene of the Temptation of Christ, in which Jesus wanders alone in the desert for forty days and forty nights, after which Satan appears and tempts Jesus to turn stones into bread. Jesus refuses: “ Man shall not live on bread alone.”[33]

There is a moral hunger behind our escalation of food production – an avarice, a needy greediness. But a moral hunger requires a moral solution. It will not be solved by physical excess, not even if we turn the whole world into bread. What is required is an assertion – a secular leap of faith – into the belief that human existence has value above that of a mere organism.

When we step away from the paradigm of survival and begin to ask *Why* more often, ethics inevitably finds a greater place in our planning for the future. We begin to see the world in moral terms, despising greed and

excess, and celebrating only those innovations which improve human existence. “ Living intelligently includes more than the intelligent use of means in realizing ends,” wrote the American economist Frank Knight. [34] “ It is fully as important to select the ends intelligently, for intelligent action directed towards wrong ends only makes evil greater and more certain.”

BIBLIOGRAPHY

Referencing style used is the Australian Guide to Legal Citation, Third Edition

- American Nutrition Association, ‘ USDA Defines Food Deserts’ 38(2) *Nutrition Digest*
- *CESCR General Comment No. 12: The Right to Adequate Food (Art. 11)*, 20th sess, UN Doc E/C. 12/1999/5 (12 May 1999)
- Cribb, Julian, ‘ The Coming Famine: Risks and Solutions for Global Food Security’ (Paper presented at AIAST Agricultural R&D Conference Dinner, Canberra, 11 March 2010)
- Cribb, Julian, *Surviving the 21st Century: Humanity’s Ten Great Challenges and How We Can Overcome Them* (Springer, 2017)
- Crookes, William, et al, *The Wheat Problem: Based on Remarks Made in the Presidential Address to the British Association at Bristol in 1898* (G. P. Putnam’s Sons, 1900)
- Daly, Hermann, and Kenneth Townsend, ‘ Introduction to Part II: Ethics: The Ultimate End and Value Constraints’ in Hermann Daly and Kenneth Townsend (eds) *Valuing the Earth: Economics, Ecology, Ethics* (The MIT Press, 1993) 155

- De Schutter, Olivier, Special Rapporteur, *Countries tackling hunger with a right to food approach*, Briefing Note 1 by the Special Rapporteur on the right to food to the United Nations Human Rights Council, 2010
- Ehrlich, Paul, *The Population Bomb* (Vail-Ballou Press, 1968)
- Elser, James, and Stuart White, 'Peak Phosphorous', *Foreign Policy* (online) 20 April 2010
- Food and Agriculture Organization of the United Nations, *SAVE FOOD: Global Initiative on Food Loss and Waste Reduction* UNFAO
- Garvey, T. Gregory, 'The Civic Intent of George Perkins Marsh's Anthropocentric Environmentalism' (2009) 82(1) *The New England Quarterly* 80
- Gause, Georgii, *The Struggle for Existence* (Williams & Wilkins, 1934)
- Godwin, William, *Of Population* (first published 1820, Augustus M. Kelley 1964 ed)
- Greif, Mark, 'On Food' in *Against Everything* (Verso, 2016) 37
- Kolbert, Elizabeth, 'Billions and Billions', *The New Yorker* (New York) 24 October 2011, 21
- Kolbert, Elizabeth, 'Head Count', *The New Yorker* (New York) 21 October 2013, 96
- Lewis, C. S., 'The Abolition of Man', in Hermann Daly and Kenneth Townsend (eds) *Valuing the Earth: Economics, Ecology, Ethics* (The MIT Press, 1993) 229
- Lewis, Simon, 'A Force of Nature: Our Influential Anthropocene Period' *The Guardian* (online) 24 July 2009

- Malthus, Thomas, *An Essay on the Principle of Population* (first published 1798)
- Mann, Charles, *The Wizard and the Prophet* (Knopf, 2018)
- Margulis, Lynn, and Edwin Dobb, 'Untimely Requiem' (1990) 30(1) *The Sciences* 44
- Marler, John and Jeanne Wallin, 'Human Health, the Nutritional Quality of Harvested Food and Sustainable Farming Systems' (White Paper, Nutrition Security Institute, 2006)
- Marsh, George Perkins, *Man and Nature; or, Physical Geography as Modified by Human Action* (Charles Scribner, 1864)
- Martel, Yann, *The Life of Pi* (Canongate, 2001)
- Meadows, Donella, et al, 'The Limits to Growth' in Ken Conca and Geoffrey Dabelko (eds), *Green Planet Blues: Critical Perspectives on Global Environmental Politics* (Westview Press, 2014)
- Parker, Alexander, 'Food Apocalypse Now: An Epistemological Understanding of the Current Food Crisis' (Student research paper, DePauw University, 2015)
- Pingali, Prabhu, 'Green Revolution: Impacts, limits, and the path ahead' (2012) 109(31) *Proceedings of the National Academy of Sciences of the United States of America* 12302
- Sen, Amartya, *Poverty and Famines: An Essay on Entitlement and Deprivation* (Clarendon Press, Oxford, first published 1983, Oxford Scholarship Online 2003 ed)
- Sessions, George, *Deep Ecology for the Twenty-First Century* (Shambhala, 1995)

- Simon, Julian, *The Ultimate Resource 2* (Princeton University Press, 1996)
- Singer, Peter, 'Population and the Pope', in *Ethics in the Real World: 86 brief essays on things that matter* (Text Publishing, 2016) 137
- Smil, Vaclav, 'Nitrogen Cycle and World Food Production' (2011) 2 *World Agriculture* 9
- Smith, Gerald Alonzo, 'The Purpose of Wealth: A Historical Perspective' in Hermann Daly and Kenneth Townsend (eds) *Valuing the Earth: Economics, Ecology, Ethics* (The MIT Press, 1993) 183
- *The right to food* HRC Res 37th sess, UN Doc A/HRC/37/61 (22 March 2018)
- Vogt, William, *Road to Survival* (William Sloane Associates, 1948)
- Wilberforce, Samuel, '[Review of] On the Origin of Species, by means of Natural Selection; or the Preservation of Favoured Races in the Struggle for Life' (1860) 108 *Quarterly Review*, 225
- World Health Organization, *Family planning/Contraception* (8 February 2018) World Health Organization

[1] Yann Martel, *The Life of Pi* (Canongate, 2001) 448.

[2] Betsy Hartmann, *The America Syndrome: Apocalypse, War, and Our Call to Greatness* (Seven Stories Press, 2017), cited in Mann, Charles, *The Wizard and the Prophet* (Knopf, 2018) 5.

[3] Charles Mann, *The Wizard and the Prophet* (Knopf, 2018) 7.

[4]Thomas Malthus *An Essay on the Principle of Population* (first published 1798).

[5]William Crookes et al, *The Wheat Problem: Based on Remarks Made in the Presidential Address to the British Association at Bristol in 1898* (G. P. Putnam's Sons, 1900), cited in Mann, above n 3.

[6]William Vogt, *Road to Survival* (William Sloane Associates, 1948).

[7]Paul Ehrlich, *The Population Bomb* (Vail-Ballou Press, 1968) 6.

[8]Donella Meadows et al, 'The Limits to Growth' in Ken Conca and Geoffrey Dabelko (eds), *Green Planet Blues: Critical Perspectives on Global Environmental Politics* (Westview Press, 2014).

[9] William Godwin, *Of Population* (first published 1820, Augustus M. Kelley 1964 ed) 15.

[10]Vaclav Smil, 'Nitrogen Cycle and World Food Production' (2011) 2 *World Agriculture* 9, 12.

[11] Von Laue, Max, 'Fritz Haber Gestorben' (1934) 22 *Naturwissenschaften* , 97, cited in Mann, above n 3, 170.

[12]Prabhu Pingali, 'Green Revolution: Impacts, limits, and the path ahead' (2012) 109(31) *Proceedings of the National Academy of Sciences of the United States of America* 12302, 12302.

[13] Mann, above n 3, 161.

[14]See, for example, George Sessions, *Deep Ecology for the Twenty-First Century* (Shambhala, 1995).

[15]Simon Lewis, 'A Force of Nature: Our Influential Anthropocene Period' *The Guardian* (online) 24 July 2009 .

[16]For a written version of Wilberforce's views, see: Samuel Wilberforce, '[Review of] On the Origin of Species, by means of Natural Selection; or the Preservation of Favoured Races in the Struggle for Life' (1860) 108 *Quarterly Review* , 225, 231.

[17]On an earlier draft of this paper, a friend of mine, a biology student, commented: " Have you *never* seen David Attenborough? The purpose of human existence is to survive and procreate to pass on your genes to the next generation and food provides us with the fuel that is necessary to achieve that. That's it – that is the meaning of life (you can quote me on that)."

[18] Food and Agriculture Organization of the United Nations, *SAVE FOOD: Global Initiative on Food Loss and Waste Reduction* UNFAO .

[19] Hermann Daly and Kenneth Townsend, ' Introduction to Part II: Ethics: The Ultimate End and Value Constraints' in Hermann Daly and Kenneth Townsend (eds) *Valuing the Earth: Economics, Ecology, Ethics* (The MIT Press, 1993) 155, 156.

[20]James Elser and Stuart White, ' Peak Phosphorous', *Foreign Policy* (online) 20 April 2010 .

[21]American Nutrition Association, ' USDA Defines Food Deserts' 38(2) *Nutrition Digest* .

[22]John Marler and Jeanne Wallin, ' Human Health, the Nutritional Quality of Harvested Food and Sustainable Farming Systems' (White Paper, Nutrition Security Institute, 2006).

[23]Lynn Margulis and Edwin Dobb, ' Untimely Requiem' (1990) 30(1) *The Sciences* 44, 49.

[24]George Perkins Marsh, *Man and Nature; or, Physical Geography as Modified by Human Action* (Charles Scribner, 1864), cited in Mann, above n 3, 454.

[25] In some senses, the Wizards are ' above' nature in their attempts to alter the natural environment to better accommodate us – but the point of Marsh's question is whether humans are able to alter *ourselves* , to change our own evolutionary strategy. When the Wizards aim for a technologically-aided survival without concern for the metaphysical status of humans, they are aiming towards " a savagery supported by advanced technology": T. Gregory Garvey, ' The Civic Intent of George Perkins Marsh's Anthropocentric Environmentalism' (2009) 82(1) *The New England Quarterly* 80, 103.

[26]Martel, above n 1, 456-7.

[27] *The right to food* HRC Res 37th sess, UN Doc A/HRC/37/61 (22 March 2018).

[28]See: Amartya Sen, *Poverty and Famines: An Essay on Entitlement and Deprivation* (Clarendon Press, first published 1983, Oxford Scholarship Online 2003 ed); *CESCR General Comment No. 12: The Right to Adequate Food (Art. 11)*, 20th sess, UN Doc E/C. 12/1999/5 (12 May 1999); De Schutter, Olivier, Special Rapporteur, *Countries tackling hunger with a right to food approach*, Briefing Note 1 by the Special Rapporteur on the right to food to the United Nations Human Rights Council, 2010.

[29]Like the “ deep ecological” view of humankind, the idea of population growth following inevitable laws also has a very specific origin. Georgii Gause, born 1910, was a Russian prodigy, publishing his first scientific article at age nineteen. In an attempt to win Rockefeller funding and move to America, Gause decided to prove a recent conjecture – raised by American scientists but lacking experimental proof – that all organisms including humans follow a universal law of population growth. With petri dishes, nutrients, and single-celled protozoans, Gause was able to provide the empirical data to support this theory. His findings are published in Georgii Gause, *The Struggle for Existence* (Williams & Wilkins, 1934).

[30]World Health Organization, *Family planning/Contraception* (8 February 2018) World Health Organization .

[31]Peter Singer is currently writing a book on population and ‘ ethical downsizing’, in which he advocates for a rethink of the UN’s 1994 Cairo Conference resolution that governments should have no part in setting population targets. Such a resolution, in his view, is ethical shirking, given

that population size has such wide ethical ramifications. (How do I know this? I had a good chat with him at a recent book signing.)

[32]Singer, Peter, ' Population and the Pope', in *Ethics in the Real World: 86 brief essays on things that matter* (Text Publishing, 2016) 137, 141.

[33]Matthew 4: 4, New International Version.

[34] Frank Knight, *The Economic Organization* (Harper & Row, 1993) 4, cited in Smith, Gerald Alonzo, ' The Purpose of Wealth: A Historical Perspective' in Hermann Daly and Kenneth Townsend (eds) *Valuing the Earth: Economics, Ecology, Ethics* (The MIT Press, 1993) 183, 183.