Overcoming Agricultural Anthropocentrism:

Offering Alternatives to Change the Current Trajectory

Leonie E. Stewart

Science and Technology in Society, University of Alberta

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Dr. Nathan Kowalsky

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A planet once flourishing with ecological biodiversity is now experiencing catastrophic changes as it undergoes a severe exploitation of its natural resources. Such a level of exploitation is predominantly caused by various but linked human-centric or anthropocentric forces. Everything we do as humans has an effect on the planet, and many human activities have grave and at times, unforeseeable effects. At present, we overexploit the Earth's resources constantly – with the flick of a switch we utilize fossil fuels that power electricity; with a trip in the car we emit greenhouse gases; with a purchase at the grocery store we use excessive packaging – and the extent to which the Earth's resources are being used to meet the demand of a large and growing human population has created severe exploitation. This feeding frenzy has led to the current prognosis: an astronomical number of environmental disasters and projected global temperatures that cannot sustain plant, animal, or human life in the future. The widespread consequences of human activities such as major wildlife extinction, rising sea levels, air pollution, and irreversible global warming look to perpetuate until the Earth is uninhabitable. As one population among many at extreme risk of major die-off, it is crucial that we explore what remedial options we have left.

These ecologically catastrophic changes are only characteristic of our relatively recent history as humanity's recent answers to fundamental survival questions have trended towards overlooking environmental sustainability. I have come to understand agriculture, from its ancient form to the current industrial and mass-scale variety, as one game-changing initiation if not the origin of massive human exploitation of the Earth's resources. Thus, both industrial and

ancient agriculture will be the focus of my research. Through the exploration of recent historical and scientific research surrounding agriculture, I will provide insight into how we made our way to the current crisis, what prevents us from changing our unsustainable behaviour, and how we can look within ourselves and at the external complex system in which we live, to change the current prognosis and come home to a sustainable way of life on this planet.

A Scary Prognosis

Currently, the environment is being exploited to meet an ever-increasing demand or expectation stemming from the modern lifestyle; among the many things that the modern lifestyle requires is food – which we expect to be able to get an array of in great variety at any given time, while most of us like to do so economically. Moreover, the amount of mouths to feed is increasing dramatically, which means agricultural practices have been stretched to a level of mass-scale production. The agricultural industry is occupying more and more land which decreases the land available for animal habitats. In addition, the Earth's resources that are needed to support the agricultural cultivation of plants and animals are only intensifying with mass-scale production. In particular, the Earth's water resources are being severely depleted. By being a resource-intensive process, mass-scale agriculture also continually pumps greenhouse gases (mostly methane but also carbon dioxide; Hetchman, 2022, p. 3) into the atmosphere. The influence of industrial agriculture is thus increasingly destructive, specifically as more of us humans exist on Earth and have similar or increasing expectations or demands on the agricultural system. However, to blame humans on an individual level would be unfair because we cannot help the complex system that we are born into; as Gowdy (2021) argues, the root problem is a conflict between human *systems* and nature rather than between humans

and nature. Agriculture as a system is positioned against the environment. Gowdy (2021) convincingly argues that we have become part of a self-perpetuating “superorganism” which operates at the expense of all ‘other’: land, air, water, plants, animals, or the entire biotic community. Gowdy (2021) describes the superorganism as the autonomous, hyper-connected system of economic interaction and social processes wherein the importance of perpetual growth for the sake of growth outweighs the health of internal components and the external environment. Agriculture is a key part of the inter-workings of the superorganism, and thus it is quite likely that the very process of agriculture has taken on a whole new purpose fueled by economic and social growth within the control of the superorganism.

One of the most alarming effects that the superorganism has on the environment is global warming. It is the major reason for rising sea levels, recent weather disasters, and endangerment of many species of flora and fauna across the globe. In 2019, extreme bushfires swept across Australia, emitting 300 million tons of carbon dioxide into the atmosphere and destroying upwards of 40 million acres of land, consequently wiping out approximately 1 billion animals, some species of which went extinct (Filkov, et. al., 2020). Only months later similar fires wreaked havoc across California and Siberia, exposing the truly global impact of climate change (IPCC, 2021). To many of us these effects can be felt much more directly. In fact, over this past summer I experienced heat waves in both Canada where temperatures reached a historic record of 49.6 degrees Celsius, and in Western Australia which experienced the highest number of days over 35 degrees (25), most number of days over 40 degrees (13, an increase from 7 in 2015-16), and the highest recorded temperature in Australia’s history of 50.7 degrees (Abraham 2021; Dominsino 2022).

If these global patterns continue without adequate intervention, a worst-case scenario will develop. Major fires and flooding associated with global warming will cause forced migration: not only of animals – many of us have seen the polar bear example where the icecap has melted to such a degree that the polar bear has nowhere left to go – but also of humans. With continued sea-level rise, entire coastal cities will be underwater and populations will be forced to relocate further inland. These are catastrophic, irreversible changes and will wipe out a lot of natural beauty as the continued endangerment to flora and fauna will drive many of them to extinction. Moreover, food production is going to be very difficult as crops such as rice and staple cereals become increasingly limited by rising sea-levels, temperature instability, and drought dramatically reducing suitable agricultural land. Crist (2015) argues that even though continuing these practices as a means of sustaining 10 billion or more people may be possible, it will require that we turn the planet into a "human food plantation" (Crist, 2015, para. 4). In other words, by widening the already mass-scale system of human agriculture to feed 10 billion or more people, the amount of land necessary to do so would equate to paving the entire planet with industrial farms. Gowdy (2020) hypothesizes that maintaining current agricultural practices is increasingly unlikely or impossible: due to "future climate instability, water shortages, and degraded soils, large-scale grain agriculture will be impossible within the next 100-200 years" (p. 7). Furthermore, the worst-case scenarios of climate change are the likely ones because we are not yet doing anything remotely preventative; we are quite clearly "a danger to ourselves and the rest of life" (Gowdy, 2021, p. 3).

The sheer level of exploitation caused by agriculture is lethal, and taking action should no longer be seen as a choice but a requirement for human survival. Consequences of

environmental destruction can already be felt globally, from major fire crises to extinction of flora and fauna across a myriad of ecosystems. Whilst there may be a need for many changes to our current systems in order to combat the current prognosis, a focus on the consequences of current agricultural practices and an assessment of a partial or total change is crucial for both preventative and adaptive purposes. Both as a preventative means against further climate change crises, and as a necessary adaptation to the already shifting environment that may see much, if not the entirety, of our land inhospitable in the near future, a major change to food production will be vitally beneficial. We must ask ourselves whether we want to live within an ecosystem with all forms of life and the environment being equal or alternatively with no prospect of a reconciliation whatsoever – in which case, humans might not be able to live at all. Having said this, we must ask ourselves what causes have led us to extreme and persistent global environmental catastrophe; a prime, if neglected, suspect is agriculture.

Agriculture and Anthropocentrism

The way in which we as humans see the world has radically changed since the adoption of agriculture. This change, historically speaking, is extremely recent; humans lived as hunters and gatherers, quite sustainably, for millions of years. Within the last 12,000 years we have become less altruistic and more anthropocentric as we have become reliant on agriculture at the expense of hunter-gathering. As a species, we are “humanizing the earth’s surface” (Shepard, 1973, p. 237). I intend to expose agriculture as a damaging endeavour that has engendered in humans a lethally anthropocentric point of view, and that can only succeed at the expense of the environment and ultimately all forms of life, including humanity’s own.

Anthropocentrism, like geocentrism in astronomical theory, is arguably a conceptual error arising from a misperception of reality that the human species must be separate from and superior to other forms of life and the environment. If humans see themselves as far more virtuous and thus more deserving than any other species, this logically entails a lack of altruistic concern. The introduction of agriculture to human life is the point at which altruism ends and anthropocentrism begins.

Recent research has identified a number of steps along the road to agricultural anthropocentrism, and a number of contestations of it as well. Although there were sedentary communities without agriculture, human populations becoming sedentary in wetland areas was the first step (or a precondition) of initiating agriculture. Initially, sedentism was not universally popular: in fact it was resisted for as long as possible by hunter-gatherers who could see many of sedentism's drawbacks, noting for example the rise of disease associated with such communities (Scott, 2017). The view that sedentism was not a step forward but rather a step backwards was maintained by non-sedentary populations only to lose out in the end to a "civilizational narrative" which is the mistaken assumption that humanity improves steadily over time (Scott, 2017, p. 61). It is often in the name of progress that we start to do things that remove us from the natural world and propel us towards anthropocentric behaviour. This narrative of progress still prevails today and in large part distorts our sense of our own history.

One sedentism was underway for quite some time, the state began to from and that meant separating society into classes such that only a small group makes decisions for the whole. This hierarchical system coupled with a large population was essential for sedentism and agriculture to continue because within the state, many people either died or fled. Since

agriculture requires labor, there was incentive to replace these people (Scott, 2017). If populations were mobile and non-agricultural (i.e., hunting and gathering), a separation of classes and control could not be easily enforced. Since the state divides society in terms of status, those at the pinnacle of the hierarchical society, or the elites, will go to great lengths to stay on top. Thus, states will act violently and repressively to maintain control because of what is at stake: the survival of the elite and the system it fuels. Widespread war and slavery were quick to follow from the creation of states, showcasing the length to which those at the top were willing to go to keep their power over those "below" them in the hierarchical system. The state requires a large and growing population to maintain agriculture, and thus, the establishing of states is part of the reason we have the looming population crises of feeding 10 or more billion people without rendering the planet either inhabitable or human-only.

Uniquely, agriculture entailed a dependence on and control over only a handful of taxable crops or grain. The earliest states used only a handful of crops because they could be easily managed: measured, stored, transported, and taxed (Scott, 2017, pp. 129-30). Before this, having "several diverse food webs" was the usual form food gathering would take, which would – due to its inability to be easily managed – threaten the adoption of "a single political authority" (Scott, 2017, p. 49). Frequent collapse of the earliest states reveals both the fragility of agriculture because of the reliance on a few crops, and the instability of the state as a system as it was often subject to people fleeing or dying. Due to the subsequent crowding of people, animals, and plants, these large populations were extremely prone to the catastrophic spreading of disease. According to Scott's (2017) research there are both literal diseases which swept through early states and metaphorical ones: due to the state's inherent repressiveness

and by functioning in support of the elites – at the expense of the majority – even the state itself as a system can be seen as a disease (Gowdy, 2021). Ironically, one of the biggest fears of the state was dispersal, which is the very thing that actually promotes health and decreases the chance of disease. Ancient agriculture had many obstacles and downfalls, and thus it should not come as a surprise to us that agriculture is still problematic today. Once agriculture became more widespread, it became all the more intense as it became industrialized.

A vital step in the process of widespread agricultural anthropocentrism came in the 18th century with the Industrial Revolution. The Industrial Revolution saw extreme technological growth and subsequent mass-scale production capabilities and is often described by the dominant narrative as a leap forward in human history. However, a more accurate assessment of the revolution observes both the environmental harm inflicted by industrial efforts and shocking examples of exploitation of factory workers. As Lewis Mumford (1934) demonstrates, any such progress was illusory due to, for example, "the fact that medieval hospitals were more spacious and more sanitary than their Victorian successors: the fact that in many parts of Europe the medieval worker had demonstrably a far higher standard of living than the paleotechnic drudge, tied triumphantly to a semi-automatic machine" (Mumford, 1934, p. 183). By reflecting ill health and low standards of living for the purpose of benefiting the economy, the process of industrialization embodies the ideology behind agriculture. Today, the "industrial food regime" is a leading cause of death and disease through the consumption of "mass-produced" and "low quality animal products" (Crist, 2015, para. 33). Thus, the Industrial Revolution could be seen as an example of the agrarian mindset mapping itself onto an industrial plane, causing major strain on both humans and the environment in the process. The

move to industrialization nudged anthropocentrism further forward, making it apparent that we can only think in terms of controlling nature to produce food even at the expense of animals and our own livelihood. In a sense, the industrialization of agriculture has fooled us into viewing it as an improvement when in reality our vision has been obscured.

As human consumers, we are far removed from the horrors of our own consumption: "Today great pains are taken so that people are not reminded of the origins of their meat while they are eating it" (Fitzgerald, 2010, p. 59). The process by which animals are slaughtered is "invisible but not secret" (Fitzgerald quoting Otter, 2010, p. 59) – in other words, 'out of sight, out of mind'. The beginnings of the slaughterhouse can be traced back to the early nineteenth century as industrialization was spreading; thus, considering that the agriculture movement has been underway for some 10,000 years – and keeping in mind that hunters have been killing animals for millions of years before that – the separation, concentration, and mass-scale slaughtering of animals has historically only been a function of fairly recent times.

The main reasons for distancing ourselves from the acts of slaughter are arguably a combination of the psychological ridding of guilt, the growing concern for human cleanliness, and the superorganism's appetite for increasing surplus – due to the ability to get the most product out of a single space (i.e., production efficiency). The fact that this single space became distanced from human cities permitted both the scale of the space and the concentration of production within that space: "economic activity was transformed from using resources directly for immediate livelihood to large-scale resource management to produce future surpluses" (Gowdy, 2021, p. 6). The distance between the human and non-human increased, in the name

of our own supposed well-being and progress: the slaughterhouse contributed to the upward trajectory of progress with its use of advanced technological means to increase efficiency.

Historically, the construction of intensive animal slaughterhouses far from human view "were designed and sited to reduce contemplation and questioning of them by workers and consumers" (Fitzgerald, 2010, p. 60), while simultaneously allowing for increased profits. In fact, the demand for animal products increased as the distance between consumers and animals increased due to the amount of supply and how easily accessible these products became. This is made apparent by looking at the extent to which farm-raised animals heavily outnumber the wild animals: there are "forty thousand lions and one billion domesticated pigs; five hundred thousand elephants and 1.5 billion domesticated cows; fifty million penguins and fifty billion chickens" (Hetchman, 2022, p. 5). Thus, as the demand for these industrially produced animal products increases, satisfying the appetites of more people who do not witness the slaughter at first hand, a growing population is maintained.

A recent past, present, and future issue that we face is the burgeoning population crisis, one of agriculture's side-effects. Scott (2017) identifies the period after the neolithic transition as a time in which the human population started to accelerate at an exponential rate, from increasing by one million over a five-thousand-year period, to increasing from five to a hundred million in the same amount of time. Still on its exponential trajectory, the human population is now expanding far more quickly "from 1 billion in 1800 to 7.9 billion today" (Roser et al., 2013) and the strain on the planet is already apparent. The current projection is that the population will reach 10 billion or more within my lifetime. From an anthropocentric point of view, an exponentially growing human population may be seen as a positive, however, what cannot be

ignored are the effects of climate change now perceptible to humans, which are threatening human communities around the globe. The more people there are on the planet, the more mouths there are to feed, the more agriculture required, and thus its negative impacts expand as the population does. Although severe population growth may be seen as a positive from an agrarian (and thus anthropocentric) standpoint, this in itself is problematic because the planet has a finite amount of resources and it will not do any good for humans to overlook or ignore this fact. Moreover, our ancestors' civilizations frequently collapsed and "there is no reason to believe that greater size is armour against societal dissolution. Our tightly-coupled, globalized system is, if anything, more likely to make crisis spread" (Gowdy, 2020, p. 6). Crist argues that "a world of so many billions does not, *in any* case, turn out well" (Crist, 2015, para. 4).[1] If continued, Shepard's "humanizing the earth's surface" will result in Crist's human food plantation scenario, with anthropocentrism as the key instigator.

Lurking within anthropocentrism is a lack of human accountability and thus, an escape from anthropocentrism will not be easy. As Crist (2017) points out, the belief that humans are exempt from environmental limits signifies that "because humanity is so special by comparison to all other creatures, it is proportionately that much more entitled; and thus the acts of war on the natural world that undergird our expansionism (for food production in particular) become unrecognizable as acts of war" (para. 20). The thought pattern intrinsic to agricultural anthropocentrism is then a toxic cycle in which we become unable to see our anthropocentric behaviour for what it is. Crist's insight accounts for why many of us may live our lives unaware that agriculture is the mechanism by which humanity's reach extends at the expense of the

[1] This raises the question of restricting population growth, which lies outside the scope of this paper.

non-human world. Thus, the anthropocentric exploitation of the Earth's resources can be seen as an act of war by another name. Perhaps agriculture inflicts more than just physically devastating pollution such as deforestation, greenhouse gas emissions, and disease; the internal perspectives from which these actions arise are themselves polluted. The way we see all life (our own included) is what matters – and at the end of the day, rectifying the conceptual error that is anthropocentrism might save us. The recognition of the anthropocentric bias and a disruption of its patterns of thought is essential in order to stop the war on the environment.

Recognizing our anthropocentric bias can move us towards an ethical relationship with the environment. Philip Cafaro (2002) highlights the seminal contribution to environmental ethics made by Henry David Thoreau at the beginning of the 20th century. In a journal entry from 1852, Thoreau refers to techniques that allow for recognition of the "nonhuman world" and promote "wider views of the universe" (Cafaro, 2002, p. 18), which suggests that it is possible for individuals, at least, to think their way out of the anthropocentric mindset, providing the best chance to evade its consequences. For Cafaro (2002), "recognizing the intrinsic value of nonhuman nature is the key to creating a new ethic which will preserve the environment and all the many species with whom we share it" (p. 18), and recognizable steps toward this were taken even back in the mid-nineteenth century. Thus, we should try to continue this work of attempting to escape from the agrarian and anthropocentric mindset. The first step is recognizing agriculture's side-effects and then seeing what we can do about them.

The introduction of agriculture has many side-effects: deforestation, mistreatment of animals, climate change, overpopulation, and disease. At the root of these side-effects is the exploitation of the natural world to such a degree that the fundamental and original

relationship between humans and nature – as equal components of the entire ecosystem – is distorted. Paradoxically, just as agriculture requires climate stability while playing a substantial role in de-stabilizing it, humans rely on so much of what human systems are responsible for ruining. Becoming aware of the perils inflicted upon the Earth by agriculture and acting in light of this awareness is necessary if we are to find our way out of this paradoxical and deadly situation and avoid an entirely humanized landscape, that will eventually become inhospitable to human life – which is where we are headed, and fast. Alternatives and insights can be found in humanity's past that can help alleviate the negative environmental and psychological ramifications that agriculture has caused. As we reconstruct the many steps along the way to our current predicament and those moments of contestation that have attempted to impede them, perhaps we may be able to recognize insights that may be of value to us now.

Hunting, Gathering, and Rewilding

When asked to think of hunting and gathering, many of us would conjure up an image of barbarism, ruthlessness, and limited intelligence. This prominent view is the result of anthropocentricity and the mistaken narrative of human progress which holds the current era to be the best point in human history so far and only getting better. This view must be corrected because hunter-gatherer societies actually display intelligence, respect, and love towards the animals they hunt and the environment in which they live – a very different story than the prominent narrative. Seeing as we are facing a mass scale environmental catastrophe, the race to achieve sustainability is on. It is timely that we look not only to the future but also to the past for inspiration, and dispelling the false perceptions surrounding hunting and gathering is a crucial first step before we can consider incorporating such practices into

mainstream society. To unwitting proponents of the narrative of progress this might seem an outrageous idea, but as a population at extreme risk of major die-off we should all feel the call to urgency and be willing to try unconventional solutions. In this section, I will argue that humans lived quite well and respectfully as hunters and gatherers for a number of reasons, including intrinsic environmental sustainability but chiefly rooted in a deepened relationship with animals. It is vital that we re-assess the prevailing view of hunter-gatherers by stripping away as many misperceptions about them as possible: then we might just see them not as outliers but as role models.

In the world of the hunter-gatherer, "the prey itself decides to give itself to the hunter who demonstrates appropriate skill and respect" (Kover, 2009, p. 237). In this way the animal hunted is not just another number in a sea of animals crammed together within the walls of an industrial farm. When we distance ourselves from animals, a lack of care – and indifference to mistreatment – is made easier. While humans in an industrialized world distance themselves from animals and the acts of killing them, hunters and gatherers maintain a closeness with the animals they kill. For example, the Anishinabe perspective on hunting sees a strong interdependence between animals and humans: "All life-forms are linked together in an intricate web of interconnected relationships" (Wawatie and Pyne, 2010, p. 105). The closeness to animals exhibited by hunter-gatherers represents direct and unmediated experience which acknowledges the dependency that humans have on animals and their intrinsic value. Animals hunted are viewed by the hunter as a great gift: "Just to eat one [a deer] is an honour, and for him to give his life to feed me is one of the greatest gifts you can ever receive" (Reo and Whyte, 2011, p. 21). Seeing one's own act of eating (or receiving) a deer as "an honour" and being

grateful to the animal, acknowledges the magnitude of its sacrifice and demonstrates a level of consciousness and respect that is almost unheard of in the modern context of everyday anthropocentrism.

Another way traditional hunters show the hunted animal respect is through giving "spoken prayers" to the animal to show their appreciation and by being careful not to inflict any injury (Reo and Whyte, 2011, p. 20). This is typically instilled in hunters from a young age as "to injure a deer disrepects the deer's life and the gift of life they have offered to the hunter" (Reo and Whyte, 2011, p. 23). Tobacco, frequently used for medicinal purposes, is also given as a gift and seen as a mark of respect for the animals spiritually. Beyond showing a great respect towards animals, Lac Du Flambeau (LDF) hunters demonstrate another kind of respect by "leaving the woods the way [they] found it by not littering" (Reo and Whyte, 2011, p. 19). Thus, respecting the animals being hunted extends to respect for the shared human-animal habitat. These acts of kindness fundamental to hunting have been lost in industrialized society; minimally then, we can rid ourselves of the outmoded view of hunters as ruthless and instead understand the recognition, respect, and fundamental honesty towards animals exhibited by hunter-gatherers in the past and even those who live within contemporary society. In fact, Gowdy (2020) thinks that these Indigenous hunter-gathering groups "may be the only humans having the necessary skills to survive a climate/social/technological apocalypse" (p. 8).

For hunter-gatherers, the knowledge of and experience with killing animals is not only justifiably ethically sound but also brings supposed health benefits: "Unlike store bought meats, they knew exactly where their venison came from, that it was processed cleanly and that the deer ate a natural diet free of hormones and other chemicals" (Reo and Whyte, 2011, p. 18).

Another health advantage to hunting is that a hunter would find it problematic to over-consume because such an act would directly cause there to be no more food for next season. Thus illnesses related to overconsumption are much less likely in hunter-gatherer societies. Moreover, the domestication of animals is known to stimulate disease in the herds, whereas the hunting of wild animals is known to provide health benefits to the herd as a whole naturally weeding out disease and other infirmities (Kawata, 2009, p. 180-90). In a natural setting, the less agile are the most susceptible both to other predators and also to human hunters while the fittest animals usually survive; wolves seek out the old and weak deliberately, while human hunters have less of a chance against the strongest or fittest animals. Another health benefit to hunting is that hunters must be active or mobile and this contributes to increased overall human health, while the alternative – being sedentary and less active – has the opposite effect. Hunting and gathering also supports the health of the environment by not significantly altering it. By picking a handful of berries from a tree or taking a few leaves from a flourishing plant, but even more importantly by "conducting themselves in the woods as if they were in someone else's home" (Reo and Whyte, 2011, p. 19), hunter-gatherer's pay close attention to the landscape and are careful not to disrespect it. This is a stark contrast to the agrarian manipulating the landscape, for example, by ploughing the land and chemically fertilizing the soil, to suit the growing needs of the industrial population. Agriculture and civilizations are abusive environments (Gowdy, 2021, pp. 52-53); the agrarian meets nature with separation and hostility rather than humility (Kover, 2009, p. 236).

Further results from Reo and Whyte's (2011) study of the LDF band of hunters show that practicing respect and consideration for animals and humans goes hand in hand. Sharing is

embedded in their lifestyle: “each of the hunters mentioned they also hunt to provide meat to other people in their extended families, typically giving away as much as they kept for themselves or far more” (Reo and Whyte, 2011, p. 18). This suggests a strongly altruistic behaviour exhibited by hunter-gatherers which not only involves a respectful relationship with animals and is rooted in deep ecology, but also reinforces sharing and kindness between humans. Thus, hunting and gathering may even make us kinder to each other.

Gregory Clark (2017) retells a story from Aldo Leopold in which a wolf is killed by a group of hunters for the sake of vengeance, which illustrates not that the act of hunting itself is wrong, but rather that the intentions behind it can be. Clark (2017) suggests that killing the animal in this way was symbolic of bringing “war to the land itself,” showcasing the interdependence of humans, animals, and the land (p. 350). Mindless killing, then, is comparable to war on the land and that is not what hunting ought to be: “war on the land is wrong” (Clark, 2017, p. 350). This idea is echoed by Eileen Crist (2015), who considers human expansionism to be the main reason for environmental exploitation. She connects the idea of “stretching our food-producing capacity” at the expense of the land to “acts of war” because she argues that the amount of people the Earth can support “has been extended […] through forcefully taking over the carrying capacity of other life-forms and, in the process, wiping them out regionally or globally” (Crist, 2015, para. 20) – and this is indistinguishable from acts of war. Shepard (1973) takes the war-metaphor a step further: “Chemical agriculture, like chemical warfare, is slaughter at a distance—death poorly directed and unseen battles won” (p. 254). Insight from Clark (2017), Crist (2015), and Shepard (1973), describe physical acts of violence on the land which can also be applied on an internal level: an anthropocentric character is the

foreground for such acts of war. In the LDF hunting community however, “taboos include prohibitions of greed (i.e., shooting more deer than necessary for food) and wastefulness” (Reo and Whyte, 2011, p. 21). As Gowdy (2021) contends: “egalitarianism was the norm before agriculture [i.e., when hunting and gathering societies were prominent]” and therefore, “rapaciousness and greed are not the result of human nature” (Gowdy, 2021, p. 11). Thus the very things that can quickly exacerbate environmental harm (and are often characteristic of an industrialized society), such as greed and wastefulness, are not tolerated in hunter-gatherer societies.

Having now considered hunting and gathering as a practice of respecting animals with sustainability measures in place and physical and communal health benefits, perhaps hunting and gathering is a hitherto overlooked solution that could be a viable alternative to industrial food production in the future. Scott (2017) contends that after states collapsed in the past and their populations reverted to hunting and gathering, the population on average saw an improvement in well-being. Due to embedded practices of respect, environmental sustainability, and overall human health, hunting and gathering would be beneficial for humans. A possible incorporation of hunting and gathering into mainstream society would require a form of relinquishing control that will challenge deeply embedded notions about what makes us secure. ‘Rewilding’ is necessary, both physically and mentally, in order for us to surrender the agricultural power over other species we have recently become accustomed to: “To rewild is […] to welcome that which lies outside human domination or control” (Kowalsky, 2021, p. 190). Actively promoting a transition to hunting and gathering, in which animals

function more as partners than subordinates, could be a form of rewilding that we should consider adopting.

Perhaps by pre-emptively adopting these hunter-gatherer practices it might be possible for us to mitigate the scary prognosis and skip a full collapse phase. Hunting and gathering could provide us with vital tools to dispel the antagonistic and moreover, toxic, separation between humans, the environment, and all other forms of life. Perhaps only then may we fully "recapture some of the sense of humility and respect displayed by foragers towards wild species – attitudes which are perhaps necessary in order to prevent their loss" (Kover, 2009, p. 245). Hunting and gathering could be the great awakening that we desperately need.

Yet we cannot sustain 10 billion with hunting and gathering alone, as Shepard (1973) points out. We can overcome the agricultural anthropocentric bias and learn to respect animals and the environment with occasional hunting and gathering, but on the issue of sustaining the entire population, it would be too much (for the animals) and thus it must be supplemented. In light of this, Shepard (1973) illustrates a futuristic scenario in which we "rid the earth of agriculture, its industrial extensions, and mental correlates" (p. 260). He suggests that we use bacteria which "can be made into high-quality food" (p. 261) Shepard (1973) also suggests that we could use petroleum to grow yeast and "synthetic fats or margarines" (p. 262) and this would suffice for meeting the demand of the coming world population (p. 261). Although Shepard (1973) is right to seek out alternatives to industrial agriculture and these suggestions are feasible, perhaps there are alternatives to agriculture that are more convincing. Along with hunting and gathering, other modalities, as for example, biotechnology and entomophagy, must also be considered.

Biotechnology

There are many arguments to be made for replacing the costly animal-raising and slaughtering industry. Environmentally speaking, the greenhouse gas emissions associated with industrialized meat production, the depletion of water resources, the encouraging of large-scale deforestation, all show how massively detrimental to the Earth's systems industrialized meat production is. Can new biotechnology be a solution to the negative outcomes associated with current meat production? If we are to meet the challenge of feeding the increasing world population, biotechnology could offer a unique advantage: retaining the consumption of meat while using technological means to do so, removing both the mistreatment of animals and the gross emission rates from the equation.

Using advanced biotechnologies involves growing meat cells in bioreactors, harvesting them through centrifugation and ultimately distributing them to the population in a variety of forms: "Compared to the conventional production of beef, sheep, pork, and poultry, cultured meat could result in 78-96% less greenhouse gas emissions, 99% less land use, 92-96% less water use, and 7-45% less energy use" (Hetchman, 2022, p. 3). Cultivated meat, then, avoids the slaughterhouse, along with the harmful emissions. Moreover, the major sticking point with this method is only minor: the acceptance of such an alternative to the slaughterhouse tradition might be difficult, initially, to obtain. As many scholars have suggested, it will be hard to get consumers on board with a biotechnological model that is potentially viewed as unnatural or perhaps almost science-fictional. But more importantly, biotechnology offers us an option to feed everyone, even 10 billion, without covering the planet with industrial farms and slaughterhouses.

Utilizing biotechnology may be favoured by defenders and proponents of the misleading narrative of progress because it is an example of using new technology to fix old technological problems. At the same time, biotechnological alternatives to meat production are becoming more realistic and realizable within our lifetimes. In fact, just recently, the Good Meat company has committed to building the world's largest bioreactors for biotechnologically produced meat (Carrington, 2022). Their new and upcoming plan is environmentally-focused and will pave the way for even more technological development and growth for the business of no-kill meat: this "could be a gamechanger in the race to bring meat grown from cells to restaurants, supermarkets and dining tables" (Carrington quoting Bushnell, 2022). Thus consumers' initial reluctance to adopt biotechnology stands a chance of being overcome through such initiatives. Even with the advantages offered by futuristic and cutting-edge biotechnology, it may be difficult to know at such early stages in development whether it will succeed in replacing industrial meat production altogether. Thus, in case biotechnology does not successfully replace industrial meat production, we must consider other alternatives.

Entomophagy

Perhaps not a new, but certainly a controversial alternative to conventional animal agriculture is the consumption of insects, also called 'entomophagy'. Entomophagy belongs to the past, present, and perhaps the future of humanity – although a western perspective might be repulsed by the idea. Believe me, I know as well as any other about fear or repulsion in regard to insects and I may be one of the hardest to convince on this matter, however, I like to keep an open mind and I urge us all to do the same. Moreover, with keeping the planet from collapse as our current imperative, we should be willing to try just about anything.

As previously mentioned, facing climate change with agriculture and succeeding is extremely unlikely because land availability will continue to decrease as climate change progressively gets worse, mainly due to flooding and sea level rise, and we may not be able to convert enough of the remaining Earth's surface to meet the demand of the exponentially increasing human population. Insect farming requires land and energy inputs comparable to that of animal farming (water, food, energy, and land), but the difference is that insects use significantly less land and energy resources than animals do; insect farming uses a fraction of the land, much less water, and produces less emissions per unit of protein than animal farming (Lange and Nakamura, 2021). With insect farming's lack of dependence on industrial-scale irrigation, the water resources which we all need to survive will also not be so heavily depleted. Thus, insect farming would remove some of the major environmental impacts caused by animal farming.

Insect rearing also takes substantially less time to complete: while using the same amount of land and resources, raising livestock from birth to slaughter takes significantly longer. Therefore, using the same amount of land and resources, insect farming will produce much more food than farming animals. This vast increase in production efficiency means that less resources are required to feed more people, making insect farming a more sustainable solution to feeding the growing population. Thus, it would be viable to introduce insect farming as a replacement for conventionally farmed animal protein sources as a means to feed a large and growing population.

Moreover, increased consumption of grasshoppers has coincided with decreased pesticide use in the Philippines and several other countries – this is a major health and

environmental benefit: the consumption of insects rendered pesticide use unattractive from the health point of view (DeFoliart, 1999, p. 31). Furthermore, many insect species are high in proteins, vitamins, minerals, dietary fibers, and fats (Lange and Nakamura, 2021, p. 39). Insects have a protein content equal to and sometimes higher than animals: “the protein content of insects […] is generally in a similar range to that of port and beef” (Lange and Nakamura, 2021, p. 39). Edible insects contain high levels of minerals such as magnesium, iron, and zinc. High concentrations of dietary fiber are also found in various insect species which is advantageous to us now because modern western diets tend to be protein-heavy but fibre poor.

Western communities unlikely to adopt entomophagy might be surprised to learn that a number of human populations still consume insects around the globe. A short survey of insect-eating human populations not only establishes the practice as a generalized phenomenon but also reminds us that a reluctance to eat insects is more restricted world-wide than entomophagy, and this is culturally conditioned: we are repulsed by a food source that in the past we would have consumed without difficulty. The eating of insects may be found as a traditional and very much alive practice on every continent with the exception of Antarctica (Schrader et al., 2016, p. 111; DeFoliart, 1999, pp. 23-39). Although Western nations show the least consumption, evidence of more widespread insect-eating even in the recent past is easily accessible (Schrader et al., 2016, p. 112; DeFoliart, 1999, p. 40). However, much of insect life is now being threatened by anthropogenic factors which has severe implications.

Unfortunately, just as animals everywhere are facing extinction, “some populations of edible insects are under threat of extinction due to anthropogenic factors” (Lange and Nakamura, 2021, p. 41). To some, the extinction of insects may be seen as desirable, as

evidenced by the market demand for insect killers and pesticides, however, insects globally serve as a vital part of all natural ecosystems, and to remove them partially or completely is likely to have drastic ramifications, such as bird loss. Furthermore, insects such as bees are crucial to the pollination of food crops and thus with a decimation in the bee population comes a major threat to growing food from the crops that bees pollinate. Ecological systems in the natural world are deeply interconnected and symbiotic and therefore, in order to preserve certain living organisms, we must care for others, including insects. By guaranteeing the survival of some insect species, insect farming could do more than simply replace a protein source from conventional meat production with its manifold disadvantages, and be part of the external rewilding solution and the internal shift away from the anthropocentric perspective.

Overcoming a fear of insects and developing an appreciation and respect for them echoes the hunter-gatherer practices of respect for the animals that they consume. We could actually learn to love and respect insects that we share the environment with just as hunter-gatherer populations love and respect the land. This shift in perception moves us further from anthropocentric behaviour. Many entomologists have already acknowledged this: “To me, this is a cute, big-headed, googly-eyed tree-hopper waving playfully from a leaf tip. To others, it is an alien monstrosity with no discernible face whatsoever” (John Acorn, 2010, p. 191). Entomologists have done the work of ‘relating’ to insects, while acknowledging that by and large western populations have developed no rapport with them whatsoever, and perhaps that is the first step toward consumption of them for the sake of our future: learning to respect insects as hunters acknowledge, respect, and live on equal terms with the animals that sustain them.

Conclusion

Over the past 10,000 years our anthropocentric agenda has resulted in a population of 8 billion and will likely hit 10 billion by the end of this century. For agriculture to feed the coming 10 billion we would have to cover every last inch of the Earth with food-producing facilities. Whether or not this is even achievable still remains unclear and moreover, we might not want to live in a world of so many billions without any semblance of the natural environment remaining. In all probability, climate change will make agriculture less feasible in the near future and the current agricultural system is increasingly likely to collapse.

Agriculture has always been anthropocentric with underlying intentions to augment profit for a select few or elite class, exploiting both the land, animals (including humans), and broader ecosystems in the process. The collapse of civilization is nothing new, however, recurring environmental disasters are now a major global issue. Agriculture is a catastrophic component of our current prognosis both directly through its environmental exploitation, and indirectly through its enabling of perpetual population growth.

As a species, our options for continued survival are limited, and we must adapt quickly or else risk our futures and our future generations' existence. Clearly, substitutes for traditional meat agriculture must be ventured (among other strategies, outside the scope of this paper). Incorporating the practices of hunter-gatherers would significantly help us to overcome many of the challenges brought forth by agriculture, and will require a shift away from anthropocentrism and the unfavorable western view of hunting. This being said, hunting and gathering is limited in its capacity to provide for an excessive global population. Thus, whilst

hunting and gathering can play a vital role in shifting anthropocentric views and lifestyles, further options such as entomophagy and biotechnology must be explored concurrently.

Entomophagy is uniquely placed to offer both internal and external benefits. By learning to get over the fear of insects and the western separation from them, and instead following in the footsteps of hunter-gatherers by developing a closeness and respect for insects, we may be able to combat the internal anthropocentric bias against entomophagy. Externally, the benefits of insect farming over animal farming are plentiful: utilizing less land, water, time, and energy while providing a greater level of protein and nutrients per unit of production. Therefore, insect farming has the potential to replace animal farming altogether if we can accept it ideologically, however it will not satisfy those unwilling to give up meat as a protein source. Animal biotechnology is a viable alternative to livestock production, which could plausibly deliver protein to the coming 10 billion population while causing much less environmental harm than livestock production.

Livestock farming has to cease and can be replaced with a combination of foraging, entomophagy, and biotechnology. If those steps are taken, we can continue with our current agricultural practice where plant foods such as grains and vegetables are concerned and avoid turning the planet into a human food plantation. Where possible we should seek to hunt and gather, coupled with a combination of lab-grown meat and edible insects to supplement our protein and nutritional requirements. With these practices in place, we would have the additional benefit of avoiding further climate change and thus allowing the planet to recalibrate – supposing that other measures are also taken to decarbonize the economy. In order to put

this plan into action we need to ‘de-anthropocentrify’; the agrarian mindset has to be reset, and only then can we put sustainability into action.

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