

Make me dictator and I will save humankind.

A rational¹ approach to the emergency of the 21st century

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Abstract

Aim: This paper is on purpose provocative, in order to trigger off discussion on the future of human society. Humankind finds itself in a dire situation. Solutions have been put forth, but none has made a significant impact on carbon release or resources depletion. I add my proposal, the literary device of the dictator, as a possible scenario for dealing with the current crisis..

Design / Research methods: This paper is part of a larger project which uses micro- and macro-sociology and cliodynamics, archaeology, evolutionary biology, and dissipative systems theory to describe both our global system, and its implications for our species. I briefly critique three other approaches regarding their likelihood of success.

Conclusions / findings: The self-organized dissipative system drives population, population density, and the exploitation and depletion of natural resources. The system is the interface between humans and the environment. It is unlikely any approach which is not 1. dramatic, 2. inclusive, and 3. determinedly focused on disarming the global system will prevent the complete depletion of the natural world, and the continued mass extinction.

Originality / value of the article: The paper challenges commonly held assumptions regarding the system and human participation in it. The paper should be of interest to anyone concerned about humankind, given the breadth of our crisis; that is, the number of systems involved, from the climate, to the ocean, to the very nature of the global complex system itself.

¹ “Rational” here has the common meaning: founded on cognition, reason and facts, and not emotion; dispassionate.

Implications of the research: The paper has strong implications for policy. It describes how perpetuating ideas like “sustainable growth” can only ensure the collapse of the global system, and perhaps the collapse of the natural systems as well. The consequence of applying the research would be desperate, frighteningly objective, but will allow, perhaps, Homo to continue.

Limitations of the research: Future research could focus on re-interpreting data gathered by previous paradigms. Cliodynamics provides insight into the future by considering complex relationships. The limitations to the implications of the research lie in the fact that it is difficult to distinguish between “humankind” and the system.

Keywords: energy, limits to growth, system theory, ecological crisis

JEL: O13, P18, Q40

“This is above all an emergency and not just any emergency. This is the biggest crisis humanity has ever faced.”

Greta Thunberg, R20 Austrian World Summit, Vienna, May 2019

“On the basis of recent trends in planetary vital signs, we reaffirm the climate emergency declaration and again call for transformative change, which is needed now more than ever to protect life on Earth and remain within as many planetary boundaries as possible.”

World Scientists’ Warning of a Climate Emergency 2021 (Ripple et al. 2021)

1. Introduction

Let me introduce myself. I am a sociologist and general social scientist, and I am well qualified to be your dictator, because I fully understand our crisis, and so, clearly see what must be done. I understand the complex nature of our predicament; many others do, too, but they decline to be dictator.

About saving humankind.

Academics and philosophers of every stripe are stepping forward to save humankind. However, on closer inspection, none of them want to save humankind; what they want to save is the current global system, and mostly, the Western view of what that means.

That can not be done, sorry. The system has grown itself out, it is no longer an “open system” but has become a “closed system,”² as there is no corner of the globe

² An “open system” is permeable to energy from the outside, while a “closed system” is not. When the globe was an open system, we could harvest species to extinction and throw our filth into the seas. As

from which it does not extract something. What is the system?

The answer should be decorated with authors and thinkers, like Prigogine (Prigogine, Nicolis 1977), who describes how dissipative, near equilibrium, self organizing systems work, and ornamented with different perspectives. Like Niklas Luhmann,³ who conceived that humans are actually outside the “system.” And Peter Turchin,⁴ who authored a social science approach to complexity. I offer a descriptive answer now, and a morphological explanation farther down.

A complex system self organizes because it “iterates”; the current state produces the next state. A great example of “iteration” in humans would be “generations.” We are not our parents, but we resemble our parents in important ways. The key here is the system continually iterates, and the successful symmetry, or group of characteristics, is represented in the next instant, and those which were not successful, which failed to organize enough energy, disappear. This perpetuates the system, keeps it oriented to the flow of energy. Energy is what every such system exists for, energy to stay in a near equilibrium state, and more energy to grow.

This paper is on purpose provocative, in order to trigger off discussion on the future of human society. The paper presents a scenario for dealing with the threat of system collapse, the literary device of the dictator.

the system closed up, that ability is curtailed. A fully closed social system is one which will work harder (run faster, that is) for less and less energy, and more and more, lie in its own filth. Key to this is the point where the system begins to feed off itself, and humans are burning plastic lawn chairs and cell phones to cook and stay warm (Rao 2000).

³ Niklas Luhmann’s contribution to systems theory and the understanding of how human societies work was ground breaking. No footnote will due justice; Luhmann wrote best in German, and even then seems to have been a challenge to understand, because he was concerned people would over simplify his work. Rather than choosing a single work, I refer to an article about his work: <https://philpapers.org/s/Luhmann> and, a paper springing from his work which is appropriate to our discussion: Valentinov (2014).

⁴ Peter Turchin, Professor at the University of Connecticut in the Departments of Ecology and Evolutionary Biology, Anthropology, and Mathematics; Project Leader, Complexity Science Hub Vienna; Research Associate in the School of Anthropology, University of Oxford; Editor-in-Chief of *Clodynamics: The Journal of Quantitative History and Cultural Evolution* (http://escholarship.org/uc/irows_clodynamics; <https://peterturchin.com/> [12.12.2021]).

2. What, specifically, is our system?

The short answer is, the system of culture. My view is that culture is the interface between humans and the environment. It fully organizes who we are and places us in the context it creates. It is a system, because it organizes energy to perpetuate itself. Think of “culture” as railroads and airports and computers and social media and your ethnic group beliefs, and your sports team and your political party. Those are all things that exist because to organize energy, and they are social structure, because they commonly shape our lives. Think of everything you do today, and did a year ago, and all the money you made and spent and people you talked to and services and resources you used, all the things you do: that is the system itself. That is the primary energy of the social system of culture, you doing things. In return, the system harvests natural resources and brings them to you, so you can live. The system is culture, and culture is the interface between humans and the environment.

The system is composed of subsystems. Your nation, your state, your city or county, your church, your bank, those are all subsystems, and you can see, they all work together, most of the time. However, like the many subsystems in our bodies (circulatory, and so on), they are often in opposition, an opposition which allows the body to remain in homeostasis, a state of near equilibrium. I will elaborate more later, describing how the system arose.

For now, by “system” we mean the energy that is exchanged and organized by the gargantuan collection of networks of banks and shipping companies, churches and football teams, schools and self defense dojos, and resource and human effort extraction agencies, and everything they touch, everything that keeps and structures societies.

That is what most “save humankind” goals are now: save the global system. It is not the global social system I will save, indeed, I will make it my first and primary undertaking (after nuclear containment) to destroy the global system. This is because the global system is the source of our crisis, and may finally finish off the last of the Homo line. It is that, Homo, humankind, our children’s children, which I will save. It will not be easy, however I would have some powerful allies.

3. Someone you must meet

Please meet her beautiful and terrible majesty, the Red Queen.⁵ I introduce her from the field of biology, where it was noted that for an individual to live, it must run as fast as it can to gather enough energy, and to reproduce, it must run even faster. The brilliant scientist (Van Valen 1973) who noticed this gave her the name “Red Queen” from the stories of Lewis Carroll (1991 [1871]), since in the presence of the Red Queen, one must run fast just to stay in one place.

Actually, the Red Queen is simply the passing of energy.⁶ Existence is a zero sum game, there is only so much energy available, and life on Earth shares that energy. We recognize the Red Queen, an indispensable part of that winnowing of iterations which allows the systems to continue. If we fail to capture enough energy, we die, and the energy we have saved is spread quickly to other hungry beings, from mammalian and bird scavengers, to insects, to bacteria, to fungus and slime mold. In the end, no one escapes Her Majesty’s notice, and not just among living things, but among all the complex phenomenon of the universe; everywhere, from fleeting particles to wheeling galaxy walls, energy is constantly accumulating, and then, often very quickly, running away again.

In particular, the Red Queen is here for the system, since it, too, is just organized energy, a massive network with tendrils extending to the last corner, over grown and ripe for harvest. So, the pearl in all that is that we are not special in the universe, we rise as a species and get busy and then by and by, or perhaps now, we, the last of the

⁵ I am creating a metaphor here, which I hope will make the problem of energy more accessible. Earth is best seen as a large, sunlit rock with a thin atmosphere and a film of water and eroded rock, on which carbon molecules have become replicating dissipative systems, or “life.” However, there is only so much sunlight, and only so much water and eroded rock, and so the different manifestations, across several levels of analysis, organize themselves and compete for energy. The Red Queen is the personification of that. The global system, being also a self organized dissipative system, is also subject to Her Majesty.

⁶ Van Valen was looking for factors influencing the extinction rate of species. He focused on inter species competition; Here, I generalize the inter species arms race to its essence: energy. In the original context, the energy was the energy to survive, and more energy in order to reproduce; we simply add abiotic environmental influences to finish the metaphor. This reality is easily seen in species, for example meerkats, or grey wolves, where the entire group labors to nourish the pups of the dominant pair. It is also evident in human communities. Indeed, this same principle is applicable to all self organized, iterative dissipative systems. However, here is a more complete discussion of the concept in biology: <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/red-queen-hypothesis> [12.12.2021].

Homo clan, go extinct (Gee 2021). The Red Queen demonstrates for us the essence of energy to survival and reproduction. The Red Queen is why evolution works.

But, we are not jumping to extinction, just yet – that is if I fail. Currently, we face the following existential risks: climate change; declining energy; environmental degradation on massive scale; loss of arable land; loss of freshwater; seas poisoned with carbon and clogged with plastic. We have triggered the sixth mass extinction (Cafaro 2015). But, are these “existential” risks (Bostrom 2002)?

Humans have had hard times before. Those hard times were mediated by culture. If we assume that modern *Homo sapiens sapiens* emerged as hybrid from among the several existing homo species in Africa about 200,000 years ago (Stringer 2016), we can see that our ancestors and cousins lived through some really miserable weather.⁷ As the ice came and went, the climate on Earth would vary widely. At times, even places that did not freeze experienced drought as ice sequestered moisture to cover the north and south. Large volcanic eruptions have reduced human population; sometimes by changing the global temperature just a little bit.⁸

Just a little bit temperature change, a few degrees. Now, we again are looking at a change of climate of just a few degrees, and likely, it will be too much perturbation for the system. The climatic hard times we face now will likely be the worst, worse than volcanoes, worse than Milankovitch cycles.⁹

4. Three ideas that will not save us

In this section, I will discuss three strategies that will not save us. First, alternative energy: we will have the world we have now, but a little different. This strategy will not save us because it can not generate enough energy of the right kind. Furthermore, it won't give us the other blessings of fossil fuels, like the plastic in most solar panels. We have just too many, far too many, people, and the resources are just too widely spread.

⁷ Which weather influenced the spread of culture (see: Banks et al. 2013).

⁸ There are many, many examples; an easy one is Toba (see: Ambrose 1998).

⁹ Milankovitch cycles are changes on Earth's climate brought about by the Earth shifting it's axis, and other factors of movement, relative to the sun.

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The Earth receives sunlight every day, but even if we shade the ground around the globe with solar panels, it still won't solve key problems, and most of all, will cause other problems. One such problem is the cost of the complexity needed to maintain all those panels, to arrange for and send people to them, carrying parts and tools. We will call this the "parable of the solar array."

In this example, in our huge array, if something happened to a panel, the distance to it, for example, might cause the repair to cross the fail point of the Energy Return on Energy Invested, or EROEI, for repair. The "cross point" on EROEI is the trend slope of the amount of energy it takes to accomplish something, and that of the likely energy return. It is a measure of efficiency. So, a distant panel might not be worth fixing. Perhaps the decision might be to wait until several panels to fail in the same area, to consolidate the cost, so travel per unit is reduced sufficiently that someone can range out to fix them.

However, (and this will be a frequent example, because it recognizes the path of collapse), if enough panels start to go out, there will be less energy, and the energy to fix them will take a bigger share, essentially raising the cost of the visit. It is about the cumulative effects of running a deficit, the way the effects cascade on one another. As the system deteriorates, there will be fewer workmen, fewer spare parts, and the base costs, such as the cost of vehicles, will proportionately increase. Poorly maintained or decommissioned vehicles increase the time spent on travel.

Transportation is an important element of the system, among other things, because one of the main gifts fossil fuels give us is the gift of time. Burning oil moves a lot of payload really fast. You could walk from Maine to California, or you could walk to the airport and fly. Jet fuel gave you months of your life back. The long tendrils of the system began on foot, and small boats, and then moved to roads and so wagons and dray animals, and after a time, self propelled wheeled vehicles and today, we busy the seas and the sky with fossil fuel powered craft, and those tendrils are major network branches, mostly along sea ports, and rivers, mountain passes and crossroads.

Even if one could create solar panels using only the energy of solar panels to mine, transport, process, produce and assemble all the parts to a solar panel, it still wouldn't be enough to perpetuate the system, not enough to replace, with daily solar energy, the stored solar energy of thousands of days which fossil fuels represent.

Hydro energy (dams take a lot of energy intensive cement and need rain, and when not maintained will break down), wind energy (still no wind powered aluminum smelters exist), natural gas as an “alternative energy,” and even including the dangerous and complex nuclear plants, are unlikely to replace fossil fuels. In time, scarcity, and in consequence, cost of necessities for living will increase. Many foods may disappear from our dinner table. The increasing scarcity can be explained by the example of soap. Soap save millions of lives every day, by preventing disease and food borne illnesses. But, soap requires oil or fat; oil and fats are valuable fuels for the body and things like lamps. So, keeping clean, having soap, competes with consuming calories or extending the useful waking period. Hungry people won't make soap. No soap, means more deaths. While hunger leads finally to starvation.

As I write this, in the West, when the lights go out or the grocery store is temporarily out of something, we are confident it will pass. However, imagine it won't pass. Imagine that, as the system begins to fail, the demand on its energy resources increases, as people turn again and again to the only source of life they have known, the system. History shows, people abandon the system, go outside the system for the energy of life, further damaging the system. Imagine ceaseless and increasing loss of efficiency will rob the system of the ability to bring resources to people. Here, “efficiency” means the ratio between the input and the output of the system, the energy return on energy investment. It means that, for every endeavor, part of the energy will be wasted, because streamlined networks are down. It is a process that will continue until the system has reached a lower level of near equilibrium.¹⁰

¹⁰ By “near equilibrium” here, we mean that the system flows more or less smoothly, and has enough energy flow to demonstrate resilience, which is the ability to endure perturbations but not leave the state. By “lower level equilibrium” we mean that the system finds a level of complexity which will function on less energy passing through, but the decreased level of complexity of the system or society means that networks decline. As a consequence of lost infrastructure and less energy to expend, distances for trade increase in time, again, and resources are more dear, and the population declines. By “near equilibrium” here, we mean that the system flows more or less smoothly, and has enough energy flow to demonstrate resilience, which is the ability to endure perturbations but not leave the state. By “lower level equilibrium” we mean that the system finds a level of complexity which will function on less energy passing through, but the decreased level of complexity of the system or society means that networks decline. As a consequence of lost infrastructure and less energy to expend,

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The monotonous record of history also shows that, as it begins to collapse, the subsystem system will do anything to maintain the flow of energy. For us, that means if we leave it to current subsystems, different forms of governments, they will undoubtedly make one short term decision after another, all with unknown and unintended long term consequences, such as spreading fine particulate matter into the stratosphere to shade the Earth, or other, similarly untested and ill advised short term solutions with negative long term outcomes.

The second, and third methods of saving humankind require “coming together,” the idea that we unify all humankind for a single purpose: to save “humankind.” Though recipes vary, this comes in two specific flavors, either the one coordinating central government of Earth, or a somehow unified people with no government. Both are doomed for different specific reasons, but, also, for one common reason: the imagined power of these approaches are founded in secular humanist dogma.

A pause here to note that, to a social scientist, secular humanism, the belief in human logic and agency, functions today as the Catholic Church might have a few centuries ago. It describes how one should believe, and is the basis of law. It provides us with miracles. Most of all, it is the seat of all truth. I enjoy the benefit of that belief, just as my counterpart enjoyed the benefit of Christian belief a few centuries ago. Science, and secular humanism, order our universe, and so fill it, and wrap around us almost seamlessly.

According to Secularhumanist.org, “Secular humanism propounds a rational ethics based on human experience. It is *consequentialist*: ethical choices are judged by their results. Secular humanist ethics appeals to science, reason, and experience to justify its ethical principles.” Elsewhere on the site we are informed:

Human happiness and social justice are the larger goals of secular humanist ethics. For Owen Flanagan,¹¹ “[e]thics ... is systematic inquiry into the conditions (of the world, of individual persons, and of groups of persons) that permit humans to flourish.” These conditions include freedom from want and fear, freedom of conscience, freedom to inquire, freedom to self-govern, and so on. Undergirding all of these is a keen commitment to individualism. Secular humanism takes upon itself the Enlightenment project of

distances for trade increase in time, again, and resources are more dear, and the population declines.

¹¹ Owen Flanagan is a neurobiologist and philosopher who has written extensively from an essentially secular humanist perspective. See here: <https://www.neuro.duke.edu/people/faculty/owen-flanagan> [12.12.2021].

emancipating individuals from illicit controls of every type: the political control of repressive regimes; the ecclesiastical control of organized religion; even the social controls of societal and family expectations, conventional morality, and the tyranny of the village. This does not mean that anything goes but rather that social and political limits on human freedom must be justified by the individual and social benefits they confer.

In short, secular humanism, first of all, believes that humans have agency¹² and their actions have reliable consequences, and second of all, that all humans are of equal value.¹³ This means, yes, humans can cleverly develop new technology to save us, and everyone must be saved.

In times of plenty, ideas like the feasibility of human intervention and technological development for creating a more sustainable society are fabulous. Admittedly, we never, even twenty years ago when we went through our peak, actually achieved anything like that. The majority of people in the world live in relative poverty to support a handful of people in the developed nations. Even within those developed and sometimes socialized nations, inequality continues. Most of the work in most of the world is done by people who have little choice. However, secular humanist dogma constrains the “come together” approach.

5. One world Humankind

People “come together” in small groups, fifty to a hundred and fifty, perhaps explained by a concept known as “Dunbar’s number,” after Dunbar (1995). This concept proposes that, as biological beings, we can know and associate with small

¹² “Agency” here is distinguished from “free will;” the latter is useful in discussions regarding theology; agency refers to the possible changes any individual can make to their immediate society and the global society. It is not that humans can’t want things, and work towards them, and succeed or fail; those are all aspects of context, of the seamless, overarching, fully permeated experience of culture. There is no such thing as a solitary human. All humans are expressed as the momentary product of relative processes. We have no agency in any meaningful sense.

¹³Already, humans are not of equal value. For example, many places have a civil law in which the compensation for “wrongful death” killing someone is based on their age. A company can kill an old person or a child for much less than killing a potential wage earner. “Traditionally, courts have determined damages for wrongful death by calculating the monetary amount the victim could have provided for surviving family members, based upon income at time of death and average work-life expectancies”; https://courses2.cit.cornell.edu/sociallaw/student_projects/victimcompensation.html 12/04/21 [12.12.2021].

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groups of people. Getting many, many people together requires organization; it requires complexity. And, because of the function of complexity to the system, it would at once attempt to re-coalesce. There is no magic glue to stick people together who share little in the real world. We would, most likely, quickly develop into warring groups, rather than the cozy communal world imagined by some.

Regardless, that is not a winning philosophy to save humankind. Democracy, for example, is very expensive (Heinberg, Crownshaw 2018), which is why Athens had a democracy built on slavery (Porter 2019). The Dictator's philosophy is to save those who can be saved, who can contribute to our survival through brutal times.

The World State.¹⁴ The "one world government" idea suffers some key functional problems. As already mentioned, the most important is the problem of complexity. Joseph Tainter (2014) has carefully described the functional problem of complexity. Tainter suggests that societies increase complexity in order to solve problems, but notes that increasing complexity also increases cost (Tainter 1988). There are, in fact, exponentially increasing costs to complexity. Imagine a global government which intended to control all the people of the planet, to pass laws and implement procedures, to describe and constantly monitor bureaucratic positions. Imagine the layers and layers of bureaucracy, each layer imperfectly communication with those above¹⁵ and below it.¹⁶ Compound that need to monitor people and resources which our crisis features, scarcity, decreasing energy efficiency, overpopulation, decreasing political stability, and climate change.

Climate change, which results in extreme events, sea level rise, and most of all, declining food availability, is our overriding crisis. One of the features of climate change is not just heating, but instability. Weather instability makes it hard for farmers to know what crop to grow, or when to plant or harvest it for maximum yield. Couple

¹⁴An intentional reference to Aldous Huxley's dystopian novel, *Brave New World* (1932).

¹⁵ In the parable of the solar array, the decision to fix a panel would be made by an administrative layer which creates policy and has its own requirement, and interpreted by a management level, which has its own needs and impairments, and the service level, which trudges out to fix the panels, and a resources level which monitors and constrains the use of vehicles and supplies. Each have their own context; people often struggle to make them mesh, but not meshing wastes human and other energy.

¹⁶ I include here some crude humor regarding bureaucracies; you likely will have heard of it before, but it illustrates beautifully how immediate context is structured, and how each level has its own requirements: Warning, crude humor! Must be an adult!: <http://web.mnstate.edu/alm/humor/ThePlan.htm> [12.12.2021].

that with the problem of time, as transportation become less efficient, as mentioned in the parable of the solar panel array, above.

The massive government would consume huge amounts of energy; it would lose efficiency and increase costs as it grew. It would swiftly reach a point where it no longer returned its costs, and it would collapse. And, in the process of that, it would likely completely deplete resources, utterly trash the natural environment, and leave little for survivors of the collapse. Above all, that is what I would prevent: the final and complete draining of the resources of the planet. I would see sustainability for humankind. Sustainability means humans live within the surplus of nature.

Of course, the real problem with one world humanity and one world government is that they are, indeed, people “coming together.” That very behavior has brought us to this crisis, coming together in larger and larger organization. If we were no more social than brown bears the environment would be pristine; if the weather had kept our global numbers to fifty million, the environment would be pristine. The concept about which these ideas revolve is “sustainability.”

“Sustainability” is a word which has been very badly abused.¹⁷ It has been hooked up like a prostitute to the word “development.” There is no such thing as “sustainable development” because no development is sustainable, sustainable means “forever.” When a society has abused the natural world as bad as we have, there is no surplus

¹⁷ Much of the misunderstanding about what constitutes “sustainability” springs from the idea that humans can do anything. In the 1960s the system was growing full tilt. Population was still about 3 billion (today it is nearly 8 billion), and the post war exuberance made any dream possible. Norman Borlaug mechanized agriculture in Mexico, and got the Nobel Prize for it.

(<https://www.nobelprize.org/prizes/peace/1970/borlaug/biographical/> [12.12.2021]). At the same time, working to reduce hunger with the United Nations (and other groups), Danish agrarian economist Ester Boserup “discovered” that it was population that created more food! It was a magical breakthrough, to discover that having more chickens meant you had more grain! Except, of course, it isn’t true. Borlaug found the world with a million hungry and left it with nearly a billion hungry (<https://www.who.int/news/item/12-07-2021-un-report-pandemic-year-marked-by-spike-in-world-hunger> [12.12.2021]). What Boserup did was to discover the system of culture, which drives population growth. She saw that people responded to a bigger population by bringing in marginal lands, accepting new culture, and so on. Since the world is huge and our crop area tiny, it was easy to see we just farm the entire world! Except that, as any actual farmer can tell you, each boost in production has unintended consequences, both environmentally and socially, and one very big requirement is energy; from human energy, to oxen, to horses, to steam, to diesel. Boserup herself acknowledged likely declines in production as more land was prepared, and made distinctions between subsistence agriculture (which we know is low carbon) and agribusiness. Clearly, it was culture, racing along on new fossil fuel energy which grew eight billion people. Sadly, on collapse, the numbers will decrease, perhaps even more rapidly than they grew. See Boserup, Chambers (1965).

left to “develop.”

We say the “surplus of nature” because nature, in order to continue to provide with the energy of life, has to regenerate. The forests must grow back, since they clean our air and water, and because they also influence climate, through “surface albedo, transpiration and evaporation of water vapour, aerodynamic effects, and emission of hydrocarbons whose oxidation can form aerosol particles” (Sanderson et al. 2012). The fresh water reserves must be allowed to regenerate (He et al. 2019). Arable land must recover from our monocropping, from the use of pesticides and fertilizer, and from changes in freshwater distribution (Právělie et al. 2021).

Regarding those resources of limited availability, like fossil fuels and minerals, we have had to use increasingly damaging and energy intensive resource exploitation methods. Those methods must stop, and we must live on the resources already harvested. In short, “sustainability” is about scarcity, and growth requires abundance, not scarcity. In the natural world, were we live regardless our self-aggrandizement, “sustainability” is achieved by death, by the Red Queen.

However, in fairness, I should present for your consideration, an alternative plan, a subject for dissection. This is provided by the Club of Rome¹⁸, a group that, for more than 50 years¹⁹ has been sounding the alarm about crisis of carbon and fossil fuels. Certainly every scholar of collapse will have read the prophetic Limits to Growth (Meadows et al. 1972). The science in Limits to growth has proven to be remarkably predictive (see Bardi 2011). It would be a wonderful world, if humankind had simply read and heeded Limits to Growth.

The Club of Rome, which includes intellectuals and leaders of every approach, has published several reports intending to show the world the way to “sustainable development.” “Planetary Emergency 2.0 Securing a New Deal for People, Nature and Climate,”²⁰ a list of strategies to handle the current emergency, and somehow emerge from it with new, better organization. The publication bears consideration. It prescribes many wonderful things, though some of them are unlikely (just economy) and some are questionable (no more tree cutting, even though many places are

¹⁸ www.clubofrome.org [12.12.2021].

¹⁹ <https://www.clubofrome.org/history/112921> [12.12.2021].

²⁰ https://clubofrome.org/wp-content/uploads/2020/08/Planetary_Emergency_Plan_2.0-.pdf [12.12.2021].

experiencing drying weather and dying trees and horrible wildfires), and others are probably not possible (halt the decline of critical and vulnerable ocean ecosystems and habitats). Indeed, some of the suggestions have failed completely (universal medical care by 2020). The brief document outlines strategies which have been discussed, and have failed, for nearly 50 years.

Really, what the Club of Rome has always wanted was the preservation of, and indeed, the recruitment or conscription people into, the Western way of life. That goal, alone, fails. The Club's primary goal is that of the Enlightenment, of secular humanism, which is why the group chooses the solutions they do, regardless their repeated and obvious (because, here we still are, in an emergency) failures.

Why has the Club of Rome (we might add the United Nations²¹ and the International Panel on Climate Change²²) demonstrated decades of remarkable science but failed to bring about anything like the social change needed? The Red Queen knows. Humans, and the social structures which create their context, did not change because they could not. Because, from instant to instant what matters is life, and the lives of those we love, and because the Red Queen will not let us, or the system, stop running. Further, the Club of Rome is invested in modernity and can't suggest real emergency measures because they are educated, cultured, sophisticated and so can not propose the measures that are needed.

Only a dictator could.

6. As dictator, what, exactly, would I do?

First, we need to discuss precisely what our crisis is. The manifest cause of our crisis is population and urbanization. However, that is a symptom, and not the crisis itself. The sickness is the global social structure. Some like to call it "capitalism," but that is simply the current phase of the system. Thinking well back to the brief discussion of the complex, self organizing systems, we recall that they ceaselessly move to organize more and more energy. We recall, most importantly, that the system

²¹ <https://www.un.org/en/un75/common-agenda> [12.12.2021].

²² <https://www.ipcc.ch/> [12.12.2021].

of culture is the interface between humans and the environment.

Grasp this point, or it won't be possible to see what needs to be done. The modernist, secular humanist view is that humans created the system. We have massive tomes written "explaining" the "great men and great deeds" of history, starting even with the epic poems of the preliterate age, through the self produced propaganda of the Bronze Age kings, right down to the official histories of modern nations. History is a powerful legitimizing tool, which is why the same events look so different depending on, for popular example, whether you are the victor or the vanquished. All history is narrative, like the anthropocentric view of secular humanism. It is as those who, not understanding the true nature of the solar system, logically explained that the sun crossed the sky each day. If you are ignorant of the nature of the system, you generate humans crossing the sky.

Or the bossing the system. But, humans do not direct the system in any useful way; here we refer to "agency," what was termed "consequentialist" by the secularhumanist.org. Humans certainly do many things in life, and they intend, they hope, they take risks. It certainly seems real, and it is, all of it angling for energy, the surplus of the system. However, it is not the same as agency, the ability to do as one wishes within the system. One is propelled by propensities, constrained by social context (Blau 1994). Above all, we do not have the agency to change the system as we intend. Changes carry unintended consequences; people are reflective and adapt to social constraints. The system itself can function only in a relatively narrow range of flow; change it too far outside its current state, it might collapse. In no real sense do we control the system (Kampen, DeVita 2021). Regardless the satisfying story of history; regardless our passion when we protest, or vote; no matter the sensation we have of control, it is mythology and belief, values. It is not supported by the data. The context we experience, the choice we seem to have, are all context created by the system. We need energy to live, to have our kindred live, to reproduce²³; the system brings us that. However, it is not free.

Culture (the interface between humans and the environment) arises because it organizes humans in search of energy. It works like this: A few, (perhaps three,)

²³ True even of our distant ancestors; see Aiello, Key (2002).

million years ago, a distant Ancestor²⁴ picked up a stick or pebble, to perhaps pry something from a shell, or loosen some seeds. Watch carefully how this effected the relationship with the Red Queen: that ancestor got more food, more energy, because it was able to pry and loosen. The Ancestor lived longer, and perhaps had more offspring survive to maturity (we know, because here we are). Now, very slowly, the system of culture grows. Eventually, to enjoy the benefit of more energy from culture, the ancestor had to either carry a pebble or stick, or find food where there were pebbles and sticks. Selecting a pebble only takes a little energy, but some pebbles are shaped to more easily (with less energy) accomplish the task. Likely, at some point, Ancestor simply carried her favorite rocks, because it would allow foraging in a larger area. The presence of culture changed behavior: carry the tool, and, over time more tools. We know that Homo used tools as far from Africa as China, 2.1 million years ago (Zhu et al. 2018). As the tools got bigger, it was easier to carry food to be processed, which changed behavior and encouraged the use of something to carry in. Behavior was not the only change due our relationship with the pebble; the connections between our eyes and our hands changed, and we became more facile. Over time, our hands adapted to the pebble and our eyes to our hands. As the years rolled on, our ancestors slowly grew in number, and more rapidly became dependent on culture.

We can see it is a “positive feedback loop,” where each thing encourages the growth of the other. Culture is a system, humans simply eat, have sex, care for their kin, and die and different rates. At some point, we chose rocks with the right shape, and over time, use modified them, until culture took another hold on us, and we modified them. It had been a long time, in terms of millions of years, since any human could survive without culture. The pebble colonized our thoughts.

²⁴ Definitions this far back in our lineage are not really as crisp as we would like. Modern humans were a hybrid of all the near cousins in the relatively large area of Africa where they arose. Further, it is important not to create the idea of a single individual planting the seed of culture. Most probably, among the many bands of our ancestors, there was a gradient of likelihood of the use of tools. Over time, descendants of culture dependent Homo would outnumber those who were not, since the use of tools increased food energy. Eventually, everyone would habitually use tools, but those who had a propensity, an innate behavior, would do so better. Please keep in mind, we discuss several ancestor species and a few million years. However, we can delight at the process: the animals each behaving marginally different from those around them, but the ceaseless winnowing by the reality of the environment and competition with each other and other species, selects those whose propensities encourage behaviors that aggregate energy, and against those who don't, in reference to the Red Queen. However this discussion is not really part of the paper and it would be an unforgivable digression to include it.

By the time of Homo Erectus (who traveled widely; see Antón 2003) we had the controlled use of fire (Bellomo 1994), and that really changed us. Fire made rotten food safe to eat, and killed parasites in our food, and made it softer and easier to eat and digest. We took energy from the past, growing wood, to save our energy in the present. Except for sunlight, wood was probably the first energy source to be captured, the first time we were literally dependent on non-human energy. It allowed our lips and tongue to be smaller and more facile, and it gave us something, literally, to stare at each other across in the darkness. Sitting around the fire, getting warm and eating, and telling stories of the day's events, we became more social. That increased sociability (E.O. Wilson has suggested we are "eusocial," like bees; see Nowak et al. 2010) is no doubt crafted by culture, which has continued to make us more and more social, to the point that today nearly half the population lives in an artificial environment, the urban landscape. This domestication of humans was culture's doing.

So, did Ancestor human discover the pebble, or did the pebble discover her? Evidence described strongly points to the latter instance, but, really, the relationship was reflexive.²⁵ If human had not already had nimble fingers, and the propensities to want to live and have kin live, and if they weren't already long lived (implying a social tally of good and bad interactions, which long lived social mammals exhibit), then culture would have been stopped. It was the combination of our essential ape propensities, and the extra energy provided by the pebble. Even so, the pebble was long ago superior, even as it is today (the silicon chip, upon which we all rely for food and well being).

That Ancestor left tools in China 2.1 million years ago points out another propensity of humans which assisted, and so was nurtured, by the system of culture. We travel. Our long legs take us everywhere. And, we don't just go, we come back; for some reason "leaving Africa" is more popular than "and coming back." People don't just leave, they often go back, and when they leave they bring culture, and when they come back they bring new culture. By "culture" here we mean "trade," but also the exchange of all kind of rituals and ways of being. This propensity, the willingness to spread culture like the wind spreads milkweed, has been central to the development

²⁵ I persist in seeing culture as primary, however consider the works of Liane Gabora, who has an impressive body of work, see especially Gabora et al. (2020).

of the system, and its ability to send tendrils to scour the Earth for resources.

Human populations went up and down; though originally creatures likely from Africa, culture had allowed us to do well in colder weather. However, it was the onset of the Holocene, about 13,000 years ago, with its warm, stable climate, which saw us flourish. Why? Energy, of course!

The changing climate meant it took less energy to live. Woods appeared, and the drying of glacial rivers in the Middle East drove people from place to place, and also encouraged them to shift from horticulture, (from discouraging dangerous plants and encouraging or planting useful ones, to be harvested later in the migration), to settlement farms, dependent on crops. David Graeber²⁶ and others would rush to remind that we actually had large settlements before agriculture, at least 9000 BCE; however, those settlements were likely seasonal. It wasn't until humans became fully dependent on domesticated plants and animals that our current age began.

By about 4000 BCE the first true cities (perhaps Uruk; see Crüsemann et al. 2019) were organized. To be clear, there is no “civilization” without “cities” (*civitas*, the city). A city is a very specific thing; it features taxes, control of the market and of peripheral agriculture, and an armed force. The city arises as a nexus for the movement of food and other resources, including human slaves. Cities, you likely realize, are located, as I noted earlier, “mostly along sea ports, and rivers, and mountain passes and crossroads.” Cities do die, but not easily.

Mostly, they die of climate change (a river dries, or silts up and the city is far from the sea), or of local resource exhausting (no more tin, or copper, or gold, or amber, or large trees), and of being superseded, the system simply changes the flow of energy to them, as when maritime trade routes supplanted some terrestrial routes.

In our narrative, we have reached past the age of cities, to the age of empires. Nothing changes, except that the system continues to consolidate groups of humans into bigger and bigger empires. For most of that three thousand years, from the first real empires to the modern day, the system was powered by humans, dray animals,

²⁶ David Graeber, humanist, primitive anarchist, activist and anthropologists would not see the parameters of human society that I do, though we review much of the same data. His “new history” is a lovely story of good versus evil, with the good being the average person, and the bad those who would enslave them. It is an uplifting story; my sympathies and preferences follow him, but, sadly, the evidence does not. Even so, he was a creative and kind person, and his premature passing will be lamented for decades. Test my description against Graeber and Wengrow (2021).

wind, and wood. Then, in the 1700s CE, the system discovered coal.²⁷ The new energy sources of fossil fuels allowed populations to rapidly grow. The system was already global by then, and coal shortened the distances and increased the cargoes, and then took over the land routes. As population, and in particular, population densities, began to grow exponentially, the system bloomed.²⁸ A billion people in 1805; two billion in 1927; three billion in 1959; four in 1974; five in 1987; six in 1999; seven in 2021; and likely eight in five more years, unless there is a collapse. Through that period, the percent of urban people grew.²⁹

In general, cities are growth machines (Mlotoch 1976). They speed up distribution and so speed up natural resource depletion. They encourage yet more urbanization, by controlling the wealth of their area, and peripheral areas. This is why cities, and the elite that control them, are key to depriving the system of efficient human energy. The “social structure” of the system is described by the networks of trade and human movement. That structure organizes humans and causes them to seek to overpopulate, or over consume.³⁰

Other authors have conceived of the system as something outside ourselves. In addition to Luhmann, noted above, Hagens (2020) has identified a “super organism”

²⁷ Coal had been used occasionally for several thousand years; by discovered, we mean that the system needs and the ability to dig and transport coal in great quantities converged. Early use of coal: see They et al. (1995). See also Fernihough et al. (2021).

²⁸ <https://ourworldindata.org/grapher/world-gdp-over-the-last-two-millennia> [12.12.2021].

²⁹ “In 2008, the global urban population exceeded the rural population for the first time, and it is estimated that by 2050, 70% of the world population will live in urban areas” (UN DESA 2012). Furthermore, mid-range forecasts show an increase of around 1.5 million square kilometers of new urban land area by 2030, an area nearly equal to the land area of Mongolia, and nearly tripling the global urban land area in 2000 (Seto et al. 2011; Seto et al. 2012). See “Forecasting Urban Growth” SETO LAB <https://urbanization.yale.edu/research/theme-3> [12.12.2021].

³⁰ A brief note on the “demographic transition,” The global birth rate is actually decreasing, and urbanization is the reason. However, it works like this: in rural areas, women often have several children because children are a resource, they work. Educating women and urbanizing them changes that, suddenly her time is measured in dollars, and the children in cities have different opportunities to work, or not work. For women with time and effort invested in careers, children are a liability, taking valuable resources. After just one generation, typically, the birth rate decreases among migrants in urban areas. However, while she has fewer children, she uses much more carbon, and so do her children, since in the urban area more opportunities exist for consumption, and, as compared to the rural life, carbon increases. There is a net increase of carbon use, even though the birth rate declines. Though the birth rate is decreasing, population is projected to grow to about ten billion by 2100, though that is unlikely. https://www.ined.fr/en/everything_about_population/data/world-projections/projections-by-countries/ [12.12.2021].

which he more or less correlates with capitalism. However, he makes no attempt to explain the roots of the system, and further persists in the notion it can be somehow mitigated by human agency.

However, we know that the system is more than a just super organism, it is a self organizing dissipative system, and no human effort will have the necessary and desired effect.

So, my second act, would be to cut the spine from the social structure.

However, my first task as world dictator, would be to at once draft all nuclear scientists, and send with them troops or tanks or aircraft around the world to confiscate all nuclear weapons material, turn off nuclear power plants and, to the degree possible, make them safe against human interaction: seal the fissionable material and, to the degree possible, render them mute. The concrete which would have gone in to new buildings and parking lots would go to, (to the degree possible), eliminate nuclear war and nuclear waste. Some nations would object or hesitate, and so I would send my world warriors, the elite from every nation, to simply kill their elite. You see, we have nearly eight billion people more than can survive on the planet, and so “death” will be the penalty for violating any of my important edicts. It might easily still be the atom which kills us, either through war, or through global marine radioactivity from power plants which fail due to lack of maintenance.³¹

Then, to the cities where, without any notice, I would send my army of financial technicians in to raid the digital accounts of the wealthy, and I would then assemble One Hundred Farmers from the most traditional places on the globe to decide how to distribute that wealth. The goal is not to “modernize,” but to recapture the resilient,

³¹ Some still imagine nuclear energy as an endless source of electricity. It isn't, because, first of all, it would require retooling the globe to live on electric energy, regardless electric cars; pavement can't be made from electricity. The rule always applies, when you convert from one energy product to another, you lose energy, which is obvious. You could make gasoline from coal, but you lose a good deal of energy in the process. Likewise, turning electric energy into hydrogen, and so on. Second, we lack enough other resources to retool all of transportation to electricity. Even so, the temptations for governments to invest in nuclear will be overwhelming. I don't normally cite Wikipedia, but I found no better documented list of nuclear power plant failures to date. Crumbling social structure would increase these problems exponentially: https://en.wikipedia.org/wiki/List_of_nuclear_power_accidents_by_country [12.12.2021].

but less efficient, ways of the past. They will have to act quickly, since the digital money will vanish early on. It might be enough simply to seize the land of the wealthy and turn it over to the Hundred Farmers. Seizing the wealth of the elite will cause the cities to wither. I would decree that anyone with wealth exceeding, say, a million dollars, could be robbed with impunity.

Next, I would claim all the fossil fuels and all the vehicles that run on them to be mine. I would send an army of workers to disassemble and shut down all fossil fuel refineries, and cap the wells. It would be an on-going effort. The pressure on those workers to smuggle fuel would be tremendous, and it will only be the heads of their comrades who did so decorating the walls that would give them the strength to resist history has many lessons: there is no need to reinvent the wheel. The wells would have to be capped sufficiently to prevent the escape of methane.

The cities and nations of the world would gather their arms against me, but I will arm the poor. The poor have little to lose, and I would re-institute the taking of booty. The angry poor would swarm the great houses, if only to find food. I would sever the networks by stealing back for the environment the gift of time that fossil fuels gave us. At that point, all over the world, people would begin to die. Many would die as the large cities and states struggled to reassemble. These entities will ceaselessly try to reorganize. Likely, there would be terrible power struggles, and all of that would destroy the stability of the system, and kill people.

They would die of starvation and dehydration. They would die as their medications ran out. They would die from violence. They would die from simply laying down and not getting up. The eight billion would begin to drain away like sand, though I think it likely that, after a five years there would still be two billion or so left. With the cities, and the long networks of the social structure, disappearing, people would arrange themselves differently. "Tribalism," long the subject of derision by urban modernists,³² would rise to ascendancy again, as people learn to rely on humans they actually know. The tribe is a stable system when scarcity is common.

I would monitor the decline. I would send out an army of spies, whose families

³² We continue to have tribes, because tribes provide important social benefits. Even when there were "tribes," people had ties to other tribes, through, for example, marriage, trade agreements, mutual local responsibility for resources, and so on. We have always belonged to more than one tribe, and we do now, our professional tribe, our religious tribe, our neighborhood tribe.

would live with me as guests. I would have an army of social scientists, agriculturalists, actuaries, write a report for me every day.

This is not “going back” to great grandma’s technology, in that sense. We can not simply turn back to old technologies. We can’t trim the population and have everyone live as agrarians, and find sustainability that way. First, much of that technology is lost. Second, that technology thrived during the Holocene, when there were still rich sources of food, since early farmers, and even farmers today, hunt and forage. Most of that is gone: the great beasts which once fed us are vanishing,³³ the abundant seas are hot and acidic (Doney et al. 2009); the sparkling rivers which webbed the face of the Earth are polluted and will remain polluted as collapse causes filth of all kinds to find its way to the watersheds; we have damaged forests which housed us to the point they will never recover in the same way (Davin, de Noblet-Ducoudré 2010); climate change has caused many places to dry (Li et al. 2009), the weather will become wildly unpredictable (Hansen, Stone 2016). The low hanging fruit is gone. We have murdered the Holocene, the weather will go mad.

Even so, yes, agriculture will be important. I will allow and encourage agriculture; I will allow agricultural slavery, just as the early cities did. I will allow sea going sailing ships, since there isn’t the timber any more to build global armadas.

The murderous dictator Pol Pot, in an effort to make Kampuchea self sufficient, demonstrated how easily city people die when forced to labor like peasants. It is suggested that his measures cost the nation a quarter of its population (Heuveline 2015). A quarter of our eight billion is not enough, but the population will continue to drop. I will set the people of the world free to manage on their own, to negotiate locally, to do without. Some living in the periphery of the system will actually experience a better life, as the network of distant strangers who own their lands will disappear. When will my plan be finished? If there are still humans on the Earth in 2400, then.

³³ Vanishing biodiversity and large mammals: Cafaro (2015).

7. Some obvious questions

1. Will we go extinct?

Probably not right away, though it is quite possible.

2. Will the global system really collapse?

Yes, without question, collapse has already begun.

3. How long will global social collapse take?

Probably a hundred years or so, though perhaps sooner, if we do nothing. Experts disagree how long it took Rome to collapse; it partly depends on whether the Byzantine empire is assumed to be Rome, or not (Cowgill, Yoffee 1988). However, when Rome collapsed, there were other empires coalescing, and many places were still functional. This would be a global collapse, so it is unlikely that any nation will escape. The longer the collapse takes, the worse it is likely to be because the more complete it will be. Make me dictator and I will “rip off the bandage” on that.

4. What if things don't go to plan? What if I am thwarted?

I expect nothing to go to plan, but, because the system is already running at a maximum, it won't take too much perturbation to destabilize it. After all Covid-19 had a profoundly suppressive effect. So, even if my full plans don't come to fruition, it will still be enough. The binding networks will break down, bandit kings will fight over the scraps. The young and angry of the South will swarm the West.

I remind: these things are going to happen, anyway. The global system would limp along another, perhaps 75 years, making things worse as it goes. The difference is that now, we rip the bandaid off, we stop the system while something is left.

5. Does the carnage and death not bother me?

Of course it does! The carnage and death we have now saddens me, the realization of what will happen when the system of culture no longer organizes energy stuns me. But, do we love humankind? Do we want humans to remain on this Earth? I do.

6. Is this actually possible?

I see the big problem to be getting elected dictator! The rest will be relatively easy.

7. Do I want to be dictator?

Oh, heavens, no! I am old and diabetic; I will die in the first wave. Still, someone has to do it. I thought I would step up. Is “someone doing it” it not agency? No, because it is the context of the system which has made this possible.

8. Conclusion

I leave you with the first and only speech I would give my subjects: Today we begin to grieve. Today we start learning to suffer as all animals suffer, from hardship, from predation, from starvation. For fifteen thousand years we have been cheating the environment, we have destroyed it for ourselves and countless other species, and we must now pay that back and prevent any further destruction.

Harnessing the entire environment to serve just one species is wrong, and the Earth is about to shrug us off, and we are desperate.

I give you a few paradoxes to learn to live with: you can not live alone, but living with many others gives feet to a monster. You need to band together to ward off the bandit kings, and to band together sufficiently, you must become bandit kings. Embrace the life you will have no choice but to follow: be familiar with hunger and thank the sun and the Earth when you are not hungry; grieve the dead by habit, and by habit show gratitude for the living. If the dawn finds you alive, thrill at the privileged, and make no assumptions about sunset.

I congratulate the old and sick and trembling for expecting a rapid death early in the process, and console those who have the strength of character to live on. I give you my blessing: be more decent than you might to each other, and be as happy as you can. Humankind lives on in you.

References

Aiello L.C., Key C. (2002), Energetic consequences of being a Homo erectus female, “American Journal of Human Biology”, vol. 14, pp. 551-565.

Ambrose S.H. (1998), Late Pleistocene human population bottlenecks, volcanic winter, and differentiation of modern humans, “Journal of Human Evolution”, vol. 34 no. 6, pp. 623-651.

Antón S.C. (2003), Natural history of Homo erectus, “American Journal of Biological Anthropology”, vol. 122 no. S37, pp. 126-170.

Banks W.E., d’Errico F., Zilhão J. (2013), Human–climate interaction during the Early Upper Paleolithic: testing the hypothesis of an adaptive shift between the Proto-Aurignacian and the Early Aurignacian, “Journal of Human Evolution”, vol. 64 no. 1, pp. 39-55.

Bardi U. (2011). Limits to growth revisited, Springer, New York.

Bellomo R.V. (1994), Methods of determining early hominid behavioral activities associated with the controlled use of fire at FxJj 20 Main, Koobi Fora, Kenya, “Journal of Human Evolution”, vol. 27 no. 1-3, pp. 173-195.

Blau P. (1994), The structural context of opportunities, University of Chicago Press, Chicago.

Boserup E., Chambers R. (1965), The conditions of agricultural growth: the economics of agrarian change under population pressure, 1st ed., Routledge, London.

Bostrom N. (2002), Existential risks: analyzing human extinction scenarios and related hazards, “Journal of Evolution and Technology”, vol. 9, <http://jetpress.org/volume9/risks.html> [27.02.2022].

Cafaro P. (2015), Three ways to think about the sixth mass extinction, “Biological Conservation”, vol. 192, pp. 387-393.

Carroll L. (1991 [1871]), The garden of Live Flowers. Through the looking-glass, Project Gutenberg [26.10.2017].

Cowgill G.L., Yoffee, N. (1988), The collapse of ancient states and civilizations, University of Arizona Press, Tuscon.

Crüsemann N., van Ess M., Hilgert M., Salje B., Potts T. (eds.) (2019), Uruk: first city of the ancient world, J. Paul Getty Museum, Los Angeles.

Dunbar R.I.M. (1995), Neocortex size and group size in primates: a test of the hypothesis, “Journal of Human Evolution”, vol. 28 no. 3, pp. 287-296.

Davin E.L., de Noblet-Ducoudré N. (2010), Climatic impact of global-scale deforestation: radiative versus nonradiative processes, “Journal of Climate”, <https://journals.ametsoc.org/view/journals/clim/23/1/2009jcli3102.1.xml> [27.02.2022].

Doney S.C., Fabry V.J., Feely R.A., Kleypas J.A. (2009), Ocean acidification: the other CO₂ problem, “Annual Review of Marine Science”, vol. 1, pp. 169-192.

Fernihough A., Hjortshøj O'Rourke K. (2021), Coal and the European industrial revolution, "The Economic Journal", vol. 131 no. 635, pp. 1135-1149.

Gabora L., Steel M. (2020), Modeling a cognitive transition at the origin of cultural evolution using autocatalytic networks, "Cognitive Science", vol. 44 no. 9, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/cogs.12878> [27.02.2022].

Gee H. (2021), Humans are doomed to go extinct, "Scientific American", <https://www.scientificamerican.com/article/humans-are-doomed-to-go-extinct/> [07.12.2021].

Graeber D., Wengrow D. (2021), *The dawn of everything: a new history of humanity*, Farrar, Straus and Giroux, New York.

Hagens N.J. (2020), Economics for the future: beyond the superorganism, "Ecological Economics", vol. 169, 106520.

Hansen G., Stone D. (2016), Assessing the observed impact of anthropogenic climate change, "Nature Climate Change", vol. 6, pp. 532-537.

He F., Zarfl Ch., Bremerich V., David J.N.W., Hogan Z., Kalinkat G., Tockner K.,

Jähnig S.C. (2019), The global decline of freshwater megafauna, "Global Change Biology", vol. 25 no. 11, pp. 3883-3892.

Heinberg R., Crownshaw T. (2018), Energy decline and authoritarianism, "Biophysical Economics and Resource Quality", vol. 3 art. 8.

Heuveline P. (2015), The boundaries of genocide: quantifying the uncertainty of the death toll during the Pol Pot regime in Cambodia (1975-79), "Population Studies", vol. 69, no. 2, pp. 201-218.

Li Y., Ye W., Wang M., Yan X. (2009), Climate change and drought: a risk assessment of crop-yield impacts, "Climate Research", vol. 39 no. 1, pp. 31-46.

Kampen J., DeVita L. (2021), Agency and the last man, "Central European Review of Economics and Management", vol. 5 no. 3, pp. 13-32.

Meadows D.H., Meadows D.L., Randers J., Behrens W.W. III (1972), Limits to growth, <https://donellameadows.org/the-limits-to-growth-now-available-to-read-online/> [27.02.2022].

Molotch H. (1976), The city as a growth machine: toward a political economy of place, "American Journal of Sociology", vol. 82 no. 2, pp. 309-332.

Nowak M.A., Tarnita C.E., Wilson E.O. (2010), The evolution of eusociality, "Nature", vol. 466, pp. 1057-1062.

Porter J.D. (2019), Slavery and Athens' economic efflorescence: mill slavery as a case study, "Mare Nostrum", https://www.academia.edu/40447510/SLAVERY_AND_ATHENS_ECONOMIC_EFFLORESCENCE_MILL_SLAVERY_AS_A_CASE_STUDY [27.02.2022].

MAKE ME DICTATOR AND I WILL SAVE HUMANKIND. . . .

Prăvălie R., Patriche C., Borrelli P., Panagos P., Roșca B., Dumitrașcu M., Nita I.-A., Săvulescu I., Birsan M.-V., Bandoc G. (2021), Arable lands under the pressure of multiple land degradation processes. A global perspective, "Environmental Research", vol. 194, 110697.

Prigogine I., Nicolis G. (1977), Self-organization in non-equilibrium systems, Wiley, Hoboken.

Rao P.K. (2000), Sustainable development: economics and policy, Blackwell Publishers, Oxford.

Ripple W.J., Wolf Ch., Newsome T.M., Gregg J.W., Lenton T.M., Palomo I., Eikelboom J.A., Law B.E., Huq S., Duffy P.B., Rockström J. (2021), World scientists' warning of a climate emergency 2021, "BioScience", vol. 71 no. 9, pp. 894-898.

Sanderson M., Santini M., Valentini R., Pope E. (2012), Relationships between forests and weather EC Directorate General of the Environment, https://ec.europa.eu/environment/forests/pdf/EU_Forests_annex1.pdf [27.02.2022].

Seto K.C., Fragkias M., Güneralp B., Reilly M.K. (2011), A meta-analysis of global urban land expansion, "PLOS One", <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0023777> [12.12.2021].

Seto K.C., Güneralp B., Hutyra R.L. (2012), Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools, "Proceedings of the National Academy of Sciences of the United States of America", vol. 109 no. 40, pp. 16083-16088.

Stringer Ch. (2016), The origin and evolution of Homo sapiens, "Philosophical Transactions of the Royal Society Biological Sciences B", vol. 371 no. 1698, <https://royalsocietypublishing.org/doi/10.1098/rstb.2015.0237> [27.02.2022].

Tainter J. (1988), The collapse of complex societies, Cambridge University Press, Cambridge.

Tainter J. (2014), Collapse and sustainability: Rome, the Maya, and the modern world, "Archeological Papers of the American Anthropological Association", vol. 24 no. 1, pp. 201-214.

They I., Gril J., Vernet J.L., Meignen L., Maury J. (1995), First use of coal, "Nature", vol. 373, pp. 480-481.

Valentinov V. (2014), The complexity-sustainability trade-off in Niklas Luhmann's 'Social Systems Theory', "Systems Research and Behavioral Science", vol. 31 no. 1, pp. 14-22.

Van Valen L. (1973), A new evolutionary law, "Evolutionary Theory", http://ebme.marine.rutgers.edu/HistoryEarthSystems/HistEarthSystems_Fall2010/VanValen%201973%20Evol%20%20Theor%20.pdf [15.12.2021].

Zhu Z., Dennell R., Huang W. et al. (2018), Hominin occupation of the Chinese Loess Plateau since about 2.1 million years ago, "Nature", vol. 559, pp. 608-612.