

Can Humanity Survive the *Anthropocene*?

Can Oxford Help?

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There is an old Chinese proverb that occasionally shows up in fortune cookies and gives us cause to pause for thought. It states the obvious: ***“If you do not change direction, you are likely to end up where you are headed.”***

Simple enough, perhaps, but quite disturbing, nonetheless -- especially as we think of where we are headed as a species. For decades ecologists and system thinkers have warned us about this. More recently Pulitzer Prize winning journalists have underscored and reinforced their work by pointing out that we are in the midst of [Earth’s sixth great extinction](#) event, one which it seems we are provoking and may well not survive.

It is now clear that it has been the collective experience of European overseas colonialism and the enduring physical, cultural and intellectual legacies it has engendered that have set us up for imminent collapse as a civilization and perhaps as a species. The reasons are simple. As demographers point out, European maritime expansion since 1492 essentially “marginalized” the human population.

This does not mean we became less important in the ecosystem. We are not marginalized in this sense. Rather, the “marginalization of the human species” means that -- as a matter of near universal fact in the demographic history of the species -- we have as human beings on every continent, in every culture and every nation-state, moved toward the margins of continents. Since 1492 we have in an accelerated manner organized urban structures along coastlines and estuaries, and the trend is accelerating.

Other habits of mind cultivated in and derived from colonialism have come to shape our collective behavior in disturbing and potentially fatal ways as well. We have, for example, become accustomed to thinking of expansion – particularly outwards along putative and ever receding “frontiers” – as possible, natural and, indeed, an inevitable expression of the human enterprise. Actually, this was an ironic conclusion to draw from the discoveries of Columbus, Ferdinand Magellan and their subsequent associates, because these individuals proved that Earth was a sphere. Yet the image of an ever expanding “frontier” is a linear metaphor. It only makes sense on a flat Earth. The notion of endless frontiers is meaningless on a sphere because ultimately all experience of expansion must necessarily return to itself as the sphere is circumnavigated.

Here, then, we have a glaring contradiction and the perhaps the supreme irony of European colonial expansion. While on some level after 1492 we began to understand that the world was round, the cultural heirs of colonialism began to conceptualize the world and their place within it in very different terms, unleashing [the most ideologically charged period of flat-earth frontierism in all of human history.](#)



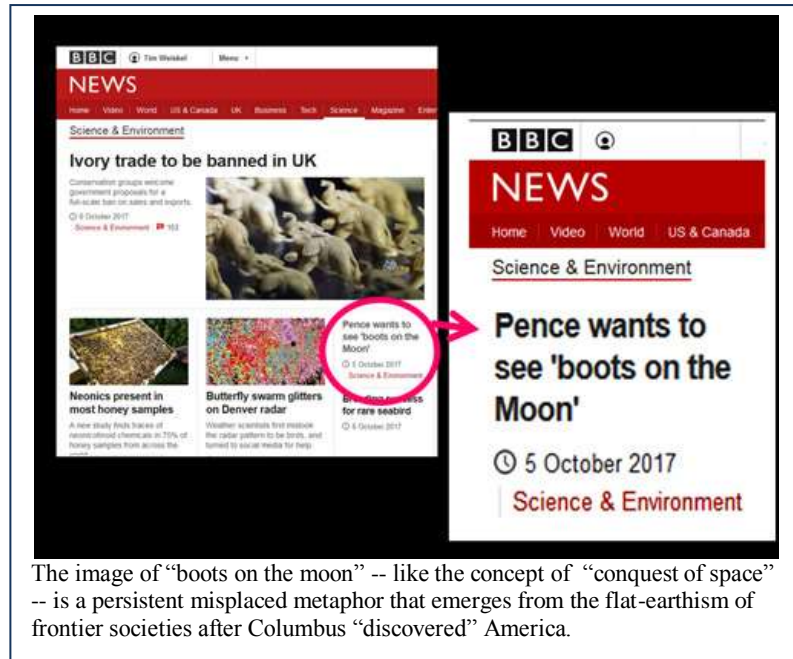
Pressing questions:

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Answers: “Maybe” and “Perhaps”

In fact, so powerful is the colonial metaphor of the ever expanding frontier that industrial culture has kept it alive well beyond the passing of any physical frontiers in the “far west” or anywhere else. In the twentieth century the concept of an ever expanding frontier has been morphed into the doctrine of an ever expanding economy. In the process, economic growth itself has become the overriding imperative of public policy, not only in “Western” countries but in nation-states throughout the world.

Indeed, the frontier has become a guiding metaphor right off planet Earth itself as national defense elites busy themselves with constructing imaginary worlds around the notion of “frontiers of space” which must be subdued and, presumably, exploited. Metaphors of competitive contests for control and conquest predictably follow. Only this month we have learned in the United States that [Congress is considering preparing for wars in space](#). This is surely a seriously dysfunctional legacy of colonial “frontierism.”



The image of “boots on the moon” -- like the concept of “conquest of space” -- is a persistent misplaced metaphor that emerges from the flat-earthism of frontier societies after Columbus “discovered” America.

Even some of humanity’s most accomplished and respected scientists appear to have been seduced by the prospect of human migration into the frontiers of space. Arguing that we are “...running out of space on Earth..” for humans astrophysicist [Stephen Hawking](#) has apparently suggested that humans should seek to “colonize” space.

Any professional biologist -- or, in fact, any third-grader who has planted a seed and watched it grow -- can recognize immediately that this is silly and suicidal. Our existence in “space” - - outside of any environment that strictly mimics and maintains the life-support conditions we know at Earth’s surface -- can only be measured in nano-seconds. We are -- thankfully -- still alive on what has accurately been called the “largest inhabitable space ship in the known universe.” Where else do we think we can go?

Beyond these major lapses of logic and leaps of imagination, we are seriously deluded as well if we think we can survive on the Earth’s surface for very much longer by pursuing our current behavior as a species. On top of becoming “marginalized” and in addition to being seriously misled about notions of continuous growth, we have also come to think collectively as a species that have transcended our trophic level in Earth’s ecosystem. We act as if we are in charge of the ecosystem and that we can bend it to our purpose.

This is perhaps the grandest conceit born of the colossal arrogance of the European colonial moment since 1492. Nowhere is this delusion more apparent than in the progressive

“industrialization of agriculture” -- perhaps the single biggest “wrong turn” taken in human affairs.

It is useful to outline what has happened because the transformation has become so thorough that it has ceased to be noticed at all. Much of early European colonialism was devoted to constructing agricultural plantations with the help of slave labor, and this plantation agriculture proved highly successful, providing the economic surplus for European societies to industrialize over the next several centuries. Over time on the plantations, slaves would be replaced by draft animals and ultimately by fossil fuel driven machines.

This certainly may have looked like progress, and it is understandable why a certain measure of self-congratulation emerged from human groups that introduced these technological advances. In the mid- to late-twentieth century with the global expansion of the “Green Revolution” these achievements worked to reinforce the myth that humanity had “conquered” famine. Humankind tripled its total population in a little over seventy years -- from 1946 to roughly 2017 -- while the proportion of those engaged in agriculture in industrial nations dropped to as low as 3 to 5%. It seemed to many – perhaps most of all, the “experts” – that the human community had “solved” the agricultural problem. What’s not to like?

Sadly, with the retrospective understanding of several centuries we are only now beginning to conduct a full socio-ecological cost-accounting of the self-inflicted wounds we have wrought on Earth’s ecosystem by blindly following the misplaced metaphors of colonial culture. On slave-based agricultural plantations, a human life may have been “cheap” by comparison with the true value of a human soul, but it appeared to slave owners that labor was expensive. As they viewed things, it was costly to capture, subdue, feed, transport, purchase and maintain a labor force from thousands of miles away even before it could begin a day of work. Of the three factors of production – land, labor and capital – labor, as they saw it, was the most expensive factor of all.

It was natural, therefore, that in “economizing” on the inputs to the plantation system, the attention of owners would focus upon developing labor-saving devices in order to make production more “efficient.” Menial labor could still be conducted by the slave class, but increasingly the harvesting, processing, packing and shipping of agricultural products from plantations came to be dominated by machines. Investments of capital concentrated on improving efficiencies of agricultural processing and the scale of shipping and not so much on developing the fertility of the soils or improving the working conditions for the slave laborers. The cotton gin, the weaving mills and the steam engine were hailed as important milestones for the emergence of industry society, but their impact was no less extensive on agriculture itself.

Indeed agriculture itself was becoming increasingly mechanized and eventually motorized as first the steam engine and then the internal combustion engine began to power tractors and pull combines. With the systematic use of fossil-fuels in all aspects of production from the creation and application of artificial fertilizers, herbicides, pesticides, etc. and the massive construction of irrigation systems, water pumping and tractor plowing, it was clear by the high point of the “Green Revolution” that agriculture had become an “industry” with an ever shrinking labor force and an ever greater dependence upon cheap fossil-fuel subsidies.

The rapid adoption of what became known as the “miracle crops” of the Green Revolution tended to amplify the unfolding ecological tragedy. Their extensive cultivation throughout Europe, the Americas and Asia led effectively to a pattern of “plant genetic collapse” as a wide variety of native species that had been grown for thousands of years were displaced by the monocropping of a few selected varieties that had been purposely bred to respond only to the petro-chemical inputs designed to boost immediate yields.

In schematic terms, more and more of the world’s rapidly growing population had come to depend on a radically reduced range of cultigens that were grown in mono-cropped environments with increasingly capital-intensive methods that depended on ever greater subsidies from non-renewable fossil-fuels. This was without doubt the most massive ecological transformation of plant production in human history, transforming solar sustainable agricultural systems into petro-dependent ones in a matter of only five decades. Economists – wedded to the mythology of limitless growth – hailed this achievement as a remarkable “revolution,” and Dr. Norman Borlaug – its principal architect and advocate – was awarded the Nobel Peace Prize in 1970 for this accomplishments.

In retrospect, though, from the vantage point of ecology, the achievement was more dubious. Borlaug and the Green Revolution advocates had not “solved” the hunger problem. Instead, they essentially postponed it and, in the process, amplified it. The human population more than tripled as the “Green Revolution” took root around the world. Further, and perhaps more ominous, their revolutionary achievement had only been possible because they tied agriculture ever more tightly to the continued availability of cheap non-renewable energy sources. As the price of fossil fuels increases over time, the whole process of industrializing agriculture in this manner will probably look like one more of the mistakes that has ensued from the misplaced metaphors inherited from the colonial past.

Ultimately, agriculture cannot be “industrialized.” While the planting, harvesting, processing, transport, packaging, preservation, preparing and presentation of food can be automated, in the final analysis the whole enterprise depends upon the continued viability of a myriad of biological processes. Agribusiness may be an industry, but agriculture is a subset of biology.

This may be both true and obvious to anyone who understands ecosystems, but it is not the prevailing wisdom in cultures that are derived from the colonial experience. On the contrary, in this cultural context, the industrialization of agriculture has been taken to a new level of unreality with the financialization of industry itself. In the United States, [Amazon has bought Whole Foods](#), and globally, [Monsanto is merging with Bayer](#), the pharmaceutical giant. Agriculture has come to be thought of -- so it is argued -- as a subset of agribusiness and not the other way around. Youngsters in urban settings have come to believe that Amazon and Monsanto produce food in much the same way that they think Exxon-Mobil “produces” oil.

Unfortunately, if we wish to survive as a species, we will need to overcome the myopia of our colonial metaphors and relearn some simple biological truths. We need to come to the collective understanding that humans do not produce food. As any biologist can attest, with the single (important) exception of women’s breast milk, humans do not produce food. This is because we cannot do so. We are not on the primary trophic level in Earth’s ecosystem. We do not photosynthesize. Hence, humans do not produce food. Plants do. The best we can hope for is to facilitate the conditions under which plants can continue to produce food *for us*. Further, there is more bad news. Plants – on their own -- cannot produce food, either. They

require soil -- or some other self-replenishing medium from which their roots can draw nourishment and grow.

With the “frontier mentality” of colonial agriculture, these plain facts were simply ignored. When soils became depleted the collective response was to “move west,” settle new territory, “conquer new frontiers” and ravage the inherent fertility of “virgin soil.” This became the watchword of a system of predatory, agrarian expansion in all of the white settler societies in the European colonial moment. The trouble is that on a sphere all “frontiers” are eventually “conquered” and the soils were quickly despoiled -- in a geological split-second. What may have taken tens of thousands of years to create by weathering and natural biogeochemical processes could disappear in a single extreme weather event like a typhoon or hurricane, as we have come to witness dramatically in our time. Cubic kilometers of topsoil have ended up as sediment right before our eyes as changes in weather and climate have compounded the disastrous results of tragically myopic land management practices.

In another realm, Al Gore has become famous world-wide for drawing our attention to the precariousness of Earth’s ecosystem enveloped by a thin layer of improbable gases. Any change in the percentage composition of that thin atmosphere will have, as he has justifiably pointed out, an enormous impact on all life systems on Earth’s surface. For demonstrating this in a movie he received an Academy Award and ultimately shared a Nobel Peace Prize for this insight.

As yet, there has been no comparable public embrace of the importance of topsoil. We are dealing in this instance with an immensely important and significantly more vulnerable layer of the Earth system that will determine our life prospects as a species. Moreover, while the atmosphere is measured in terms of miles or kilometers, topsoil is measured in terms of inches or centimeters. It is not an exaggeration to say that ultimately all of human populations and civilizations – past, present and future – depend on the first [few inches of topsoil thinly distributed on the substrate of rock on Earth’s islands and continents](#). In effect, we all depend on topsoil, yet as a legacy of our colonial myopia, [we have been treating it like dirt](#).

Geologists tell us that Earth has now entered the geological era of the *Anthropocene* – the period in Earth history during which the human species has become the driving force for system change in Earth’s surficial geology. While the precise dates for the beginning of this epoch are still being debated, there is little question that we are alive in a new geological moment. Simply put, however, the question is this: can humans survive the Anthropocene?

The answer is not self-evident.

Further, it is not clear that Oxford – or any other of the leading universities around the world -- can provide the insight and inspiration quickly and effectively enough to assist the human community to make the transition to a sustainable future in the Anthropocene. At this point, Oxford is basking in the glory of its achievements as an institution. It is quite proud of the fact that it has been placed at the top of the Times Higher Education [World University Rankings](#) for the second year in a row.

Surely, this is a significant achievement, but is this enough? Perhaps not.

The challenge at hand is one on a grander scale. Britain's *Astronomer Royal*, Lord Martin Rees, has phrased it quite starkly in Oxford and elsewhere: [“Is this our final century?”](#) Moreover, to draw attention to the seriousness of our circumstance he and others have created a [Centre for the Study of Existential Risk \(CSER\)](#) at Cambridge University.

This Centre and Lord Martin Rees's speeches around the world have confronted universities with a major challenge. The “macro-question” is this: can universities help the human species make the transition from its current dependence upon non-renewable fossil-fuels to become instead permanently renewable through the sustainable use of solar energy and regenerative agriculture?

Once again, the answer is not self-evident.

The reasons for this are bound up in the structure of the university itself. One of Oxford's major tasks – like that of any other university – is to provide trained graduates to assume leadership roles in the major institutions in Britain and around the world. One major means of accomplishing this is through the degree program known as PPE – Philosophy, Politics and Economics – in which students learn and prove their proficiency in the logic and operation of growth economics. In short, by doing well in this degree program and others like it, Oxford graduates are, in effect, perpetuating and entrenching the practices of perpetual economic growth, just when society needs to make a major paradigm shift away from the logic of this colonial cultural legacy. Oxford's best minds are not part of the solution to the problem. They can often be part of its perpetuation.

Outside proposals have been made to alter the effective focus of the PPE degree to represent a different set of priorities -- [Physics, Philosophy and Ecosystem-studies](#), but it is doubtful that such an idea would receive a hearing in the Oxford circles that would be required to act to implement such a reform. Beyond a shift in curriculum of this nature, it should be noted that remarkable individual scholars like [Kate Raworth](#), a graduate of Balliol College, are making valiant efforts to re-formulate the discipline of economics itself. This is an enormous task, but well worth the effort. To the extent that she is successful in her campaign to reshape economics there is hope that the human community might be able to make the transition toward sustainability.

For the moment, however, Oxford and most other degree-granting institutions of higher education have failed to implement the curriculum changes required to assist the paradigm shift needed for sustainability. An honest answer to the questions:

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needs to be given in terms of “perhaps” and “maybe.” At this point there is no strong assurance in either instance.

Fortunately, hopeful signs are present in other activities in Oxford. **The Oxford Climate Society**, for example, has recently announced plans to organize [“The Oxford School of Climate Change.”](#) Further, the Oxford Martin School is going to focus in a specific series of lectures on what it calls, [“Great Transitions: navigating 21st century challenges.”](#) These talks promise to be informative and stimulating, and they are usually posted as web-streams

through the Internet for the entire world to access. Finally, and more continuously over the Internet an organization called called, [Voices from Oxford \(VOX\)](#) has offered a different perspective than those developed in the formal Oxford degree programs. As part of its mission to be “broadcasting...to the four corners of the world” VOX has created an Internet accessible platform “Theme” which it calls [“People and Planet.”](#) through which it presents timely interviews and talks by people working on global environment and sustainability issues either as visiting scholars or as part of the ongoing Oxford faculty.

In fact, beyond any one of the elite universities around the world, there are signs that a informal, trans-national and truly international platforms for advanced learning are beginning to emerge [as a kind of global “meta-university”](#) to advance teaching and learning through the Internet. Most universities and institutes of advanced research have so far used the world-wide-web as a means of advancing their own institutional profile and programs. This is quite natural, but it represents a sadly limited view of what the Internet can, in fact, achieve. The World-Wide-Web can, if properly designed, be deployed as a truly world-wide network of learning and research, transcending any particular institution, national tradition or disciplinary boundary. As [the world’s highest ranking university](#) Oxford could take the lead in designing such a platform and presenting it to the English-speaking world. With appropriate links to China, India, African and Latin American universities a project of this nature could significantly advance global understanding on issues of vital concern for all of human survival.

Initiatives like these outline briefly here are creating a positive path forward to help Oxford students and the wider world begin to [envision the transitions needed](#) for a sustainable future on our finite planet. They very much deserve our continuing attention and enduring support. We will need to enlist all of our language skills and communication technologies to advance these kinds of transition studies quickly. The imperative is clear. The reason is simple:

There is no “Planet B.” We only have one Earth. We only get one chance.