



May 2023

## Confronting a Different World

Contribution to GTI Forum [Big History and Great Transition](#)

Jan Zalasiewicz

It is, as ever, stimulating and thought-provoking to read David Christian's [explorations](#) of Big History, and of how this time- and space-spanning concept can relate to the idea of a Great Transition in societal awareness and collective action. At heart, one can only applaud, and encourage, this exercise in building a grander perspective to understand the rapidly changing world—and, more fundamentally, the rapidly changing Earth—around us. Still, one might use this opportunity to chew over one or two more ideas which seem to be germane, in one way or another, to the matter at issue.

One is the sheer scale and speed of the phenomena associated with the Anthropocene: the geological Anthropocene, that is—essentially the original concept of Paul Crutzen—the one that represents overwhelming change to the Earth System, rather than the interpretation referring to all significant human impacts on our planet, ranging back 50 millennia or more.<sup>1</sup> The former is just some seventy years long. Yet, in that time, atmospheric carbon dioxide levels have increased by approximately 100 ppm, more than half a trillion tons of concrete have been produced (enough for a kilo per square meter of the Earth's surface, land, and sea), the amounts of reactive nitrogen and phosphorus at the Earth's surface have doubled, plastics have been spread worldwide by wind and water currents to form a kind of hyper-persistent lint layer—and so on, and so on. Take an even briefer time scale—say, the one that separates us today from Crutzen's coinage of the term in 2000—and the speed and scale become starker. In 2000, the “anthropogenic” mass on Earth—all the things that we build that are in functional use—was equivalent to about half the mass of the biosphere, of all living things on Earth. Now, it has zoomed to exceed the biosphere in mass.

Something very big and very recent is clearly going on, at planetary scale. This is despite the

fact that, as individuals of *Homo sapiens*, we are biologically, cognitively, physically, pretty much the same as our ancestors going back a long, long time—arguably to the “cognitive revolution” some 50 millennia ago. Read, say, Lucretius’s deductions on the nature of reality more than two thousand years ago—in rhyming couplets, no less—and one is communing with a mind that is as modern, sharp, and subtle as any alive today. Who can say that musical intelligence has increased since Bach and Mozart (or artistic intelligence since the Altamira cave-painters)? Or the quality of scientific thought since Comte de Buffon and Alexander von Humboldt (or Aristotle, for that matter)? There are more of us, true, but that by itself is not the factor X that has led to what has now crystallized as the “Great Acceleration” of population, industrialization, and globalization that ignited in the mid-twentieth century.

The critical threshold may well have something to do with the technosphere, the brainchild of Peter Haff, which is not just the sum of all technological constructions on Earth, but their intertwinement with the humans and human systems—board rooms, political parties, trade unions—that notionally “built” them.<sup>2</sup> The technosphere in this sense operates at different levels than individual artefacts and individual manufacturers/operators, in the way that the behavior of the biosphere is not simply the sum of the behaviors of individual plant and animal species, but has emergent properties of its own. The global technosphere, thus, has just recently emerged and, as Peter Haff has said, is now “racing ahead like a forest fire” and evolving at furious speed. We humans are bound up in it and are now almost wholly dependent on it to survive. But we cannot be said to control it, not least because we are divided into multiple competing or warring factions at almost every level of what might be called global society.

But can the technosphere be guided, or perhaps nudged, into pathways that are a little less destructive? (For while the biosphere has become almost perfect at recycling, the infant technosphere is appalling in this respect, its functional parts being embedded in a growing waste mass an order of magnitude greater than it is.) David Christian makes the analogy of how single-celled life, about a billion years ago, gave rise to multicellular organisms, in which the millions of individual cells collaborate to build a functional greater whole. This was indeed a mighty evolutionary step, but from a paleontologist’s perspective, it was not quick, taking the best part of a billion years from the earliest, tentative experiments deep in the Precambrian to its definitive expression in the “Cambrian explosion” (itself taking some 30 million years) a little more

than half a billion years ago. Throughout all of this almost unimaginably protracted gestation period, the biosphere remained functionally microbe-ruled. What took the metazoans so long? While posited answers to this question often dwell on environmental constraints such as oxygen levels, I am drawn to the argument that building the necessary cellular command-and-control systems was just so difficult that it needed these many millions of years of trial-and-error to develop proper functionality.

So we have our work cut out to build the collaborative structures that can help us better comprehend, and navigate, the turbulent conditions of the hotter and biologically depleted world of the emerging Anthropocene. Are we, thus, on a descent to nothing? Well, one of the great gifts of the Big History perspective is that it shows that what is now happening has no real analogue in the 4.5-billion-year history of our planet or (so far as we are aware) in the 13-billion-year history of the cosmos. While we can find partial analogues for some of the planetary symptoms as regards, say, global warming (in the Paleocene-Eocene Thermal Maximum) or mass extinctions (the Cretaceous-Paleogene event, for instance), nothing like the technosphere, and all its weirdly various possibilities, has emerged on this planet. Maybe that gives scope for hope as well as foreboding.

## Endnotes

1. Paul J. Crutzen and Eugene F. Stoermer, "The 'Anthropocene,'" International Geosphere-Biosphere Programme (IGBP) Newsletter, 2000, reprinted in "Have We Entered the 'Anthropocene'?" International Geosphere-Biosphere Programme, October 31, 2020, [http://www.igbp.net/news/opinion/opinion/havewe-enteredtheanthropocene.5\\_d8b4c3c12bf3be638a8000578.html](http://www.igbp.net/news/opinion/opinion/havewe-enteredtheanthropocene.5_d8b4c3c12bf3be638a8000578.html); Julia Adeney Thomas and Jan Zalasiewicz, "Strata and Three Stories," *RCC Perspectives: Transformations in Environment and Society* 3 (2020).
2. Peter Haff, "Technology and Human Purpose: The Problem of Solids Transport on the Earth's Surface," *Earth System Dynamics* 3 (2012) 149–56.

---

## About the Author



Jan Zalasiewicz is Emeritus Professor of Paleobiology at the University of Leicester. A geologist and paleontologist, he has taught geology and Earth history, and studied fossil ecosystems and environments across half a billion years of geological time. He is the author of such books as *The Earth After Us*, *The Planet in a Pebble*, and (with Mark Williams) *The Goldilocks Planet*, *Ocean Worlds*, *Skeletons*, and *The Cosmic Oasis*. His interests include graptolites (extinct plankton), mudrocks, ancient climate, and the concept of the Anthropocene.

---

## About the Publication

Published by the [Great Transition Initiative](#).

Under our Creative Commons BY-NC-ND copyright, you may freely republish our content, without alteration, for non-commercial purposes as long as you include an explicit attribution to the Great Transition Initiative and a link to the GTI homepage.



Cite as Jan Zalasiewicz, "Confronting a Different World," contribution to GTI Forum "Big History and Great Transition," *Great Transition Initiative* (May 2023), <https://greattransition.org/gti-forum/big-history-zalasiewicz>.

---

## About the Great Transition Initiative

The [Great Transition Initiative](#) is an international collaboration for charting pathways to a planetary civilization rooted in solidarity, sustainability, and human well-being.

As an initiative for collectively understanding and shaping the global future, GTI welcomes diverse ideas. Thus, the opinions expressed in our publications do not necessarily reflect the views of GTI or the Tellus Institute.