

The autonomous Earth: How humans created a planetary civilisation that is beyond their control

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Keynote Abstract

Humanity has become a geological force. The amount of sediments and rocks moved by humans exceed that transported by all the world's rivers. Humans have radically altered nearly all of the Earth's ice-free surface predominately via agriculture to grow food for a population that has increased from 1 billion at the start of the 19th Century to 7.6 billion today. This land use has already produced a global mass extinction event unprecedented for tens of millions of years. Via fossil-fuelled industrialisation, humans have increased concentrations of carbon dioxide in the Earth's atmosphere and in doing so raised average global surface temperatures by over 1°C. These and other impacts have recently been explored by the technosphere concept.

Coined by US geoscientist Peter Haff in 2014, the technosphere consists of individual humans, human societies, information networks, and stuff. In terms of stuff, humans have produced an extraordinary 30 trillion metric tons of things. From skyscrapers to CDs, fountains to fondue sets. A good deal of this is infrastructure, such as roads and railways, which links humanity together. The technosphere can be seen as the latest major evolutionary transition of not just life on Earth, but the Earth system itself. Adopting this planetary-scale perspective provides new insights into our current sustainability challenges. For example, rather than technological innovation being for the direct benefit of humans, it can instead be seen as an element in an autocatalytic system that increases the technosphere's energy and material consumption. Homo sapiens in that respect become elements, rather directors, of the technosphere. While multiple generations collectively built the technosphere it may prove to be largely autonomous and insensitive to human agency in terms of large-scale processes and developmental trajectory. If that is an accurate description, then we may be unable to avert climate change that would devastate communities around the world.

Rather than being a cause of despair, embracing the technosphere concept could offer a vital opportunity for humanity to gain important agency and help forge a viable route to a more sustainable future. In order for that to happen, new and quite radical reassessments are required when it comes to human's relationships to technology and the technosphere. To understand you are in a prison, you must first be able to see the bars.

James Dyke is an academic, writer and author. He is an Assistant Director of the Global Systems Institute at the University of Exeter where he also leads the MSc Global Sustainability Solutions. He writes an environmental column for the UK newspaper i and is a contributor to the Guardian, Independent, Ecologist, The Conversation and many other publications. His first book "Fire Storm and Flood: the violence of climate change" will be published in August 2021. James conducted his doctoral research at the Centre for Computational Neuroscience Robotics at the University of Sussex, and then held posts at the Max Planck Institute for Biogeochemistry in Jena, Germany, and the Centre for Complex Systems Simulation at the University of Southampton.

