How many Anthropocenes

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The Anthropocene, in its brief but vivid history, has developed many faces. A new study from the University of Leicester suggests how these can add up to a wider understanding.

One of the marks of a successful idea in science is how quickly it can develop and evolve. In the case of the Anthropocene, the conceptual evolution has taken place with extraordinary speed. The strikingly influential hypothesis launched by the late Nobel laureate Paul Crutzen (Obituary, 24th Feb 2021) in 2000, was that the actions of an industrialized humanity has impacted the Earth so greatly as to trigger a new geological epoch. Originally developed within the Earth System science community in charting global environmental change, the Anthropocene then began to be analyzed by geologists to see whether it really could be accepted, formally, on to the Geological Time scale—ongoing work steered from the outset by a University of Leicester team (Professors Zalasiewicz, Waters, Williams) and other UK and international scholars.

"It quickly spread widely across the sciences, humanities and arts, including to become a central framing concept of the IPCC, the UN Environment Programme and in international law", Waters explains. With such profound influence across so many different communities, of such different backgrounds and perspectives, though, came large questions about what the Anthropocene is, and when it started.

Originally Crutzen suggested it began as the Industrial Revolution commenced in the late 18th century, but subsequent analysis by the Anthropocene Working Group (AWG), has refined this estimate. "The greatest changes, of population, industrialization, globalization have taken place with the 'Great Acceleration' of the boom post-WWII years of the mid-20th century", Zalasiewicz explained. "In that brief spell—a little less than one average human lifetime—humanity has burned through more energy than in the previous 12 millennia and more", Williams said. This is driving the physical, chemical and biological changes to Earth that are now destabilizing the biosphere and climate, leaving records in modern-day strata, including plastics, concrete and supermarket chicken bones that justify the Anthropocene in geology.

But look at the Anthropocene from more human-based perspectives, and one can foreground human impacts on the environment that go back thousands of years. So should the beginning of the Anthropocene be pushed back to these earliest impacts, of the felling of forests, or the domestication of animals, or the spread of farmland soils, or of the linking of the New World with the Old? "All these ideas, and more, have emerged, in intense discussions that have erupted around this vivid and powerful new concept—each of which puts it in a different light", new AWG member Jens Zinke (UofL) adds. What, then, is the Anthropocene?

A new paper from the AWG, representing a wide range of academic disciplines, faces up to this conundrum, the playing out of which will determine how the Anthropocene will survive in human thinking. "Dissecting the many interpretations of the Anthropocene suggests that a range of quite distinct, but variably overlapping, concepts are in play", Waters noted. The debate has broken many barriers between academic disciplines—but also led to the risk of confusion of different meanings of the term. How should this be resolved? The authors encourage more debate across various disciplines—and suggest that eventual formalization of the Anthropocene in geology would help stabilize its interpretation and use, including to help societies to navigate the many challenges of the emerging Anthropocene world.

More information: Jan Zalasiewicz et al, The Anthropocene: Comparing Its Meaning in Geology (Chronostratigraphy) with Conceptual Approaches Arising in Other Disciplines, *Earth's Future* (2021). DOI: 10.1029/2020EF001896

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