

ANTHROPOCENE

A concept relating to significant environmental changes brought about by human activity on Earth.

Anthropocene is understood as a new geological age, on an equal footing with the Holocene and the Pleistocene, following the Holocene; a term introduced to the scientific language by the Nobel Prize winner, Paul Crutzen, chemist, and Eugene Stoermer, ecologist, in 2000. They suggested that the current moment in the history of the Earth, characterised by intense human activity on a global scale, radically influencing the course of geological processes, should be called the anthropocene. According to this concept, human activity is understood as a geological force governed by its own laws.

Human-induced changes affect the progress of erosion and sedimentation and are directly related to a range of anthropogenic processes such as colonisation, agriculture, urbanisation and global warming. Human activity contributes to changes in the composition of the atmosphere, oceans and soils, which is a direct result of the circulation of carbon, nitrogen, phosphorus and a number of metals. The effects of the changes are visible in the biosphere (e.g. disappearance of species, invasion of animals and plants adapted to changes, formation of "dead zones" in the oceans). However, anthropocene is not a fully defined unit on the Geological Time Axis. The potential of anthropocene as a fully-fledged geological unit is being studied by an interdisciplinary group of scientists from the *Anthropocene Working Group*. It consists of representatives of such disciplines as geology, ecology, palaeontology, biology, chemistry, archaeology.

Awareness of serious environmental changes did not grow with the emergence of the concept of anthropocene. Similar concepts have been known since the 18th century. The first of these, in 1778, was proposed by the French naturalist Georges-Louis Leclerc, suggesting that the whole Earth bears traces of human activity. In 1864, George Perkins Marsh, an American philologist, published "Man and Nature", which grew out of the belief that people subjugated the Earth in the mid-18th century. A similar thought guided the concept of an Italian priest and geologist, Antonio Stoppani, who in 1873 proposed a definition of the "anthropozoic era", presented in more detail in "Corso di Geologia" ("Course of Geology"). In the 1920s and 1930s, French philosopher, geologist Pierre Teilhard de Chardin and Russian mineralogist Vladimir I. Vernadsky introduced the term "noosphere" in order to define the third – after the geosphere and biosphere – phase of development of the Earth. At the end of the 20th century, Edward O. Wilson began to use the term "eremozoic", meaning "the era of solitude". At the same time as Wilson formulated the term "eremozoic", Andrew Revkin first used the term "anthropocene" to prove theses similar to those presented 8 years later by Crutzen and Stoermer.

Despite its long tradition, anthropocene has not yet been recognised as a fully-fledged geological age following the end of the Holocene. This will happen if it can be demonstrated that the concept of anthropocene meets certain conditions: a) it finds scientific justification (the geological trace of anthropocene will be sufficiently large, clean and distinctive for the epoch to be considered an autonomous part of time and not a period within the Holocene); this is the focus of the *Anthropocene Working Group's* research, b) it will be accepted and considered a useful term for the scientific community (this condition has already been met by anthropocene as a concept).

A time caesura marking the beginning of anthropocene, the so-called *Golden Spike* (the beginning of a unit of geological time), is being discussed. Several possible dates have so far been proposed. Crutzen and Stoermer identify the beginning of anthropocene with the Industrial Revolution and give an indicative date of 1800. In 2007, Crutzen, together with Will Steffen and John McNeill, moved the beginning of anthropocene to around 1750 and distinguished two phases that drastically affected the Earth's ecosystems (Lane). The first phase – referred to as the "industrial era", lasting until 1945 – was characterised by a high level of fossil fuel combustion and, as a result, an increasing amount of greenhouse gases. The second phase, which began after the Second World War, was described as a "great acceleration" and means an intensified use of the environment by man. These phases were determined on the basis of tests of carbon dioxide concentration in the atmosphere. The above-mentioned dating of anthropocene onset has not been fully accepted in the scientific world, so alternative time periods ranging from 50,000 to 500 years ago have been proposed. For archaeologists Todd Braje and Jon M. Erlandson, the beginning of anthropocene is marked by the colonisation of continents by anatomically modern people, which began about 50,000 years ago. Bruce Smith and Melinda Zeder believe that the beginning of anthropocene is a neolithic revolution that started about 11,000-9,000 years ago. For Smith and Zeder, the domestication of animals and plants has given rise to a multilevel and far-reaching impact on ecosystems, and it is precisely the beginning of human activity of deliberately subordinating nature to man that should be regarded as the beginning of anthropocene. Scientists from University College London point to 1610 as the starting date for anthropocene, which is related to the first global effects of the conquest of America in the fifteenth century, the symbolic "fusion" of continents, as well as contemporary findings that in 1610 the concentration of carbon dioxide in the Earth's atmosphere (Braje) decreased.

Proponents of the concept of anthropocene emphasize its critical potential in trans-disciplinary research, while opponents criticize anthropocentrism. They also point out that instead of studying the causes of the ecological crisis, supporters of anthropocene contribute to isolating humans from the natural world, treating them on an equal footing with the geological forces of the Earth. The idea of anthropocene is also criticised for the fact that it stems from the acceptance by its supporters of the Western perspective, according to which nature serves the human interest, while anthropocene is the crowning achievement of human technological and cultural triumph over the environment. It can be noted that since technological innovations have led the environment to the environmental crisis referred to in the context of anthropocene, humans are also able to create tools that will allow them to remedy it, for example by implementing the idea of sustainable development (the position of eco-modernists). However, this kind of approach risks underestimating the threats resulting from the current condition of ecosystems.

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Related terms: ecology, endangered landscape, industrial/post-industrial landscape

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