McNeill, J. R., Engelke, P.: THE GREAT ACCELERATION: AN ENVIRONMENTAL HISTORY OF THE ANTHROPOCENE SINCE 1945, Belknap Press: An Imprint of Harvard University Press (April 4, 2016), p. 288, ISBN: 978-0674545038

The term *anthropocene*, defined as the Earth's evolutionary period, or its geological epoch, which is significantly influenced by human activities, was popularized for the first time in 2000 by Paul J. Crutzen and Eugene F. Stoermer as part of a study of the International Geosphere-Biosphere Programme. Paul Crutzen, a 1995 Nobel Prize laureate for his research dedicated to the ozone layer, described the *anthropocene* as a period starting at the end of the 18th century, marked by the onset of the fossil fuels energy regime. *The Great Acceleration: An Environmental History of the Anthropocene since 1945* by John R. McNeil and Peter Engelke puts the concept of *anthropocene* into the historical context of the post-World War II era which Will Steffen, Paul J. Crutzen and John R. McNeill label as a *great acceleration*.

McNeill and Engelke rely on two arguments to determine the beginning of the *anthropocene* as the year 1945. The first is that the second half of the 20th century has witnessed an increase in human activity fundamentally influencing the biochemical processes that make up a significant part of the Earth's system (especially the carbon, sulphur and nitrogen cycles). The second argument is the escalation of the impact of human activity on the Earth and its biosphere in this period of time. On the contrary, the preceding conceptualisations defined the beginning of *anthropocene* as the start of the industrial revolution, overseas discoveries, or generally as the beginning of human activity.

While Crutzen focuses on the consumption of fossil fuels, which has already accounted for half of the global energy consumption in the 1890s, McNeill and Engelke added to the centre of their attention a second key trend – the population growth. They argue that while 800 to 900 million people inhabited the planet in 1780, in 2011 the human population reached 7 billion. The number of people has tripled since 1945, putting further pressure on energy sources and food production. Furthermore, the authors also describe the environmental impacts of human activity that are not related to population growth (e.g. reduction of the whale population as a result of whaling, reduction of the ozone layer, environmental catastrophes and accidents). Emissions of greenhouse gases, especially carbon dioxide, and environmental pollution associated with the extraction, transport and burning of fossil fuels is central to McNeill and Engelke's research. The evolution and impact of various coal and oil extraction methods is detailed in the first chapter, which also outlines the history of the use of nuclear, hydro, solar and wind energy and other alternative energy sources.

In addition to the population growth and energy consumption, the authors, in four chapters of the book (Energy and Population, Climate and Biodiversity, Cities and Economics, Cold War and Environmental Culture) also research the environmental impact of other human activities that have accelerated since the end of the World War II. These include the formation of agglomerations and urban centres, where 3.7 billion people live today, compared to 700 million in 1945; more than a twenty-fold increase in the amount of synthesized nitrogen used for agricultural fertilizers; and a rapid increase in plastic production and the number of motor vehicles. On the other hand, there are also some trends indicating that the peak of the *great acceleration* has already passed. These include the slowing down of population growth, declining sea fishing, halting the construction of large hydropower plants, and taking effective ozone recovery measures.

The third key perspective which, although is not directly formulated by the authors, interlinks all four chapters of the book, is a social or cultural perspective. It outlines the main government attempts to regulate birth rates or relocate populations, starting with such efforts in China and India. It also focuses on urbanization and suburbanization processes, the formation of slums and informal settlements, and the growth of inequalities and social barriers between poor and wealthy urban populations. This perspective is particularly crucial in terms of mapping the evolution of public interest in the environment and the origins of the environmental movements and institutions. This mapping links the most important environmental events with increasing public awareness and political will to take sustainable development measures that can be important incentives for change.

McNeill and Engelke's approach is to a certain extent related to the concept of *planetary boundaries* created by a group of scientists from the Stockholm Resilience Centre led by Johan Rockström. *The Great Acceleration: An Environmental History of the Anthropocene since 1945* puts all the major processes on Earth for which Rockström identified the capacity boundary (climate, biodiversity, nitrogen cycle, phosphorus, ocean acidification, land use, freshwater flows, ozone layer, atmospheric aerosols, chemical pollution) into historical perspective based on the major historical events related to energy production and population growth.

The book provides a not a very optimistic insight into modern history from an environmental perspective. With examples of many environmental disasters across continents, it shows that natural resources are limited and that a period of *great acceleration* will not last for a long time. Although the birth rate is expected to fall by 2050, the energy system will have to become much less dependent on fossil fuels. The authors therefore argue that the human future depends, to a large extent, on the ability to adopt effective policies that will prevent irreparable damage to the planet.

The concept of the *anthropocene*, as defined by McNeill and Engelke, lies between the people-centred (e.g. Sen, Stiglitz) and planet-centred (e.g. Rockström) approaches to global development. The main conclusion drawn from this ambiguous position is that the impact of human activity on the environment over the last few decades, albeit largely random and unintentional, may have fatal consequences on people's well-being and the existence of human civilization in the long run.

Aneta Haimannová[*]

REFERENCES

Crutzen P. J., Stoermer E. F. (2000): *The Anthropocene*. IGBP Global Change Newsl. 41, 17–18, 2000.

Crutzen P. J. (2002): Geology of mankind, *Nature 415*, *23*, 2002, http://dx.doi.org/10.1038/415023a.

Steffen W., Crutzen P. J., McNeill J. R. (2007): The Anthropocene: are humans now overwhelming the great forces of nature. *Ambio 36*, 614–621, 2007.

Rockström, J., Klum, M. (2005): *Big World, Small Planet*: Abundance within Planetary Boundaries. New Haven: Yale University Press, 2015, 208 p., 978-0-300-21836-7

[*]*Palacky University, Faculty of Science, 17. listopadu 1192/12, 779 00 Olomouc, email: AnetaHaimannova@seznam.cz*