



Editorial

Coronavirus: An Anthropocene's hybrid? The need for a geoethic perspective for the future of the Earth

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The debate on geoethics has expanded in recent years in the context of safeguarding the environment and climate [1]. It can certainly contribute above all in educating the territory in terms of integrated risk management until it becomes a tool capable of enhancing resilience and safeguarding the common good. Although geoethics is considered as a branch of geosciences, philosophers, sociologists, economists and, currently, also geographers have tried to define it from their own points of view. In simple terms, geoethics provides the guidelines to orientate society in choosing the appropriate behaviors with respect to the concrete problems of human life, trying to find solutions compatible with the preservation of nature, territory and the common good [1,2]. Geoethics also aims to create a framework for meaningful cooperation between governments, industries (representing geo-resource developers), civil society (geo-resource users), non-governmental organizations (NGOs) and geoscientists, with the aim of an eco-sustainable development of georesources [3]. The key points of the geoethical observation are, therefore, the following: promoting the diversity of ecosystems; evaluating the long-term effects of human activities on the environment and also on the human species; making predictions to reverse the unexpected consequences deriving from human activities and maintaining adequate opportunities and alternatives open to the posterity to use natural resources [4]. This represents the paradigm of the present time according to which man's production and consumption model causes flows of matter that modify the dynamics of the Earth system. This function is typical of the current Anthropocene geological era [5]: the era in which the activities of mankind modulate the state and the development

path of the Earth planet. Thus, going beyond its scientific meaning, the concept of Anthropocene conveys a double message. First of all, the development paths of human history and the natural ones of the Earth system can intersect. Secondly, to understand the global processes, it is necessary to request the synthesis of the *know-how* of the social sciences and the human and natural sciences [6,7].

The crisis of the last few weeks due to the pandemic caused by Coronavirus makes us reflect on the need for a “geoethic look” at human behavior towards the environment. Depredating and disrupting the ecosystems, especially the primary forests, allow the so-called “species jump” by viruses present in wild animals to other mammals such as the human beings [8].

In fact, the passage of pathogens (such as viruses) from wild animals to humans (zoonosis) is facilitated by the progressive destruction and modification of ecosystems due to: the penetration of humans into the last uncontaminated areas of the planet; the trade, often illegal and uncontrolled, of wild species that it actually creates intimate contact between animals and their pathogens [9]. These emerging diseases may have a dramatic cost in terms of human lives and strong socio-economic impacts, as happened in the course of history with several epidemics such as the bubonic plague that killed a third of the European population in the Middle Ages [9].

Consequently, even the disaster linked to the Coronavirus pandemic is not a natural disaster [10], as some media emphasize, but it is a disaster that has human origins, due to our actions that contribute to weaken the natural ecosystems, thus promoting the spread of pathogens. Early studies also hypothesize this scenario for the Coronavirus spread due to zoonotic transfer [11], thus excluding creations or manipulations in the laboratories.

The Coronavirus, in fact, is nothing more than a Latourian hybrid [12], an object belonging to both nature and culture, a “product” of the Anthropocene. Humanity is changing the world, with the side effect of its activities; this is having unforeseen consequences, many of which are harmful to humans and to other species: extreme weather events, more widespread and faster epidemics, food and water shortages and a wide range of further consequences such as political instability and mass migration. Therefore, the Anthropocene is not so much the epoch of artificial nature, but the epoch of hybrid nature, “almost-human” or “almost-natural” [13].

In the current phase of crisis management in Europe, various factors of social, institutional and cultural vulnerability are emerging. As for earthquakes, landslides and floods that, impacting on a vulnerable territory, cause disaster, even epidemics, if accompanied by an approximately management of the institutional communication, bad behavior and education of citizens, inadequate number of health structures and medical personnel, may turn into disasters. In Italy it is also necessary to take into account the high number of the elderly population, as well as citizens in difficult socio-economic conditions that contribute to increase, therefore, the social vulnerability of the nation.

Globally, if in this phase we are thinking about how to rightly contain the pandemic and to identify the vaccine, at the end of this story, the prevention lessons we should learn are precisely ethical: stop the deforestation, invasion and disruption of the natural ecosystems that host wild animals; ban the commercialization of wild animals anywhere in the world; conserve the nature and restore the damaged habitats to preserve our health and well-being. This implies the need to revise our ways of “edifying our future” and to take care of the world where we dwell. Therefore, it is necessary to put environmental ethics before economic interests and to adopt an integrated and multidisciplinary perspective to solve the great challenges related to the global change.

In this context, geoethics, born from the intersection of geography, geology and philosophy, appeals to the sphere of human thought, to the ethical responsibility and to the concept of noosphere, in order to reconsider the relationship between human and nature [14–16].

Conflicts of interest

All authors declare no conflicts of interest in this paper.

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