

THE SIXTH EXXTINCTION

An unnatural history

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Life has existed on Earth for a long time. Animals evolved from marine creatures like fish and trilobites, to dinosaurs and mammalians, from which humans descend. Darwin and Wallace simultaneously came up with their views on evolution. However, although Darwin's notion of "survival of the fittest" is well known; the idea that continued was more one of gradual evolution and creation of new lineages and species, among animals and plants; and less one of the disappearance of species, and even less one of extinction or sudden disappearance. Geological and paleontological evidence shows clearly that on a few occasions during the past half a million years, mass extinctions took place. The most famous being at the end of the Cretaceous period when the dinosaurs disappeared suddenly. This event is understood as being related to a huge meteorite that knocked into Earth, somewhere in what is today the Gulf of Mexico. The tremendous impact must have blown so much dust into the air that sunlight was screened out and Earth became clouded, cooling down. The disappearance of the dinosaurs and their contemporaneous species was related to a climate change.

Other occasions of mass extinction had taken place earlier, like at the end of the Permian period when successive volcanic eruptions troubled the Earth and the huge amounts of volcanic gasses that were belched out, led to drastic change in the atmosphere, suffocating and poisoning numerous animals and plants. This mass extinction is explained more by the chemical impact rather than by dust or climate.

In her book "The Sixth Extinction", Elizabeth Kolbert shares her findings on how life evolves, or rather disappears from Earth. The book starts with a lively description of an attempt to rescue frogs, toads and other amphibians in Panama. As in many places all over the world, amphibians are disappearing at a rather fast rate due to a fungus which contaminates them and kills them. In subsequent chapters she follows teams of researchers and wild life conservators specialising not only in amphibians, but also in birds, bats and rhinos. She shares her first-hand account of diving at the Great Barrier Reef in Australia. The coral reefs have sophisticated communities living in perfect symbiosis, sharing and providing food and shelter among the different forms of life which live within the reef.

With discussions on climate change and warming of the planet, one of the questions is the impact of the rising CO₂ content of the atmosphere dissolving into the ocean water leading to seawater acidification. Kolbert joins a research team studying the fauna and flora near submarine natural CO₂ vents along the Italian coast at Castello Aragonese, west of Naples. These vents are related to volcanic activity, just like the Vesuvius and the Etna. At some distance of the vents the seawater is of the usual quality and pH, with the usual variety of fish, shells, and seaweed of normal populations. When diving and approaching the submarine vents, the water becomes more and more acid and the number and variety of the aquatic fauna declines. Further it appears that among those that survive, their condition is quite distressing with the thickness of the shells becoming thinner and thinner, and even perforation of the shells leaving the animals bare and unprotected. This is what takes place on a local

scale near a natural submarine CO₂ vent. What will happen in future when further CO₂ output from industry into the atmosphere will render the oceans more acidic, not only on a local scale, but on a global scale?

Yes, it turns out that we are living in a period of mass extinction which started some time ago. From fossil records it is clear that while our ancestors some 15 000 years ago hunted mammoth, or more recently dodos and moa, these animals are no longer part of our contemporaneous environment. Hunting is not the only reason for the extinction. Humans have spread all over the world from their initial location somewhere in Africa. While spreading, the humans took with them their grains and domesticated animals, introducing species into places where they had no natural predators or competitors; whether it were the rabbits that were brought to Australia, or the tropical crabs to Europe, or dominating grasses and weeds taking over from native shrubs and therefore withholding specific animals from their most suitable food. Other more recent reasons are agriculture and urbanisation leading to loss of habitat for many flora and fauna species. This sixth extinction is undeniably anthropocene (name of the period in which human activity began to have significant impact on Earth). However, this period may have started much earlier than the industrial revolution, as it is often indicated. It may have started when our ancestor humans started hunting more than their need. It may have been when they started agriculture and breeding, and settled in measures that were no longer in equilibrium with the natural environment. The anthropocene may have started in prehistory.

Kolbert travels to Europe where she meets anthropologists specialising in the Neanderthal. DNA studies suggest the humans that are our direct ancestors interbred with the Neanderthal. About 4% of the genetic structure identifies with Neanderthal, at least in European and Asian populations. But as with mammoth and mastodon, the Neanderthal also disappeared in prehistory. Should we associate this disappearance to mass extinction? As suggested by the scientists cited by Kolbert, human DNA differs very slightly from Neanderthal DNA. Is the different gene a "madness" gene? Is it the gene that leads humans to live a life which is out of balance with nature? But also the gene which allows the humans to challenge boundaries and travel the world, the oceans and even space? Is it the gene that allows us humans to question and therefore build up societies and cultures? This book reads like a novel, meanwhile it is interesting, intriguing and at the end mind-troubling.

