

Acceptance speech

20 June 2024

Rodolfo Dirzo, awardee in the Ecology and Conservation Biology category (16th edition)

For a biologist who loves nature, it is a real privilege to cultivate the science of ecology through the study of biodiversity and in light of the major challenges facing the Earth's biological wealth due to the impact of human activity. Such privilege, however, comes with the inescapable duty to share the products of this academic labor with society at large.

For this reason, on behalf of myself and my colleague Dr. Gerardo Ceballos, I want to begin this speech by thanking the BBVA Foundation, and the members of the selection committee, for granting us the Frontiers of Knowledge Award in the Ecology and Conservation Biology category. This recognition is of deep significance to us, since it catalyzes our urgent call to acknowledge anthropogenic impact on biodiversity as a global environmental change of no less importance than, for instance, climate change. We also wish to thank our beloved families for their invaluable support, which nurtures and sustains our work.

Our work rests, first and foremost, on our appreciation of the profound importance of the biological wealth our Earth is home to. We now know that the origin of life goes back a barely imaginable four billion years. It is striking, fascinating, that for approximately 85% of this time, the expressions of life remained in a state of evolutionary lethargy characterized by the presence of bacteria and other "simple" organisms, and that it was not until "only" 542 million years ago that the world saw a veritable explosion of biodiversity, setting it on a course of relentless diversification into ever more complex life forms, despite the irruption of five mass extinction events.

The latest of these biological catastrophes took place 66 million years ago, unleashed by a meteorite crashing into what is now the Yucatán Peninsula, in Mexico. This extinction is extraordinarily resonant from a human standpoint. On the one hand, it brought the reign of the dinosaurs to an end, opening up an ecological space for the evolutionary flourishing of mammals, with a primate lineage that included the newly emerged species of *Homo sapiens*. On the other, the astonishing rebound that followed this extinction represents the pinnacle of biological diversification since the emergence of life on Earth. In other words, we made our appearance on the ecological-evolutionary stage at

a time when we shared it with the largest number of fellow beings in planetary history.

It is this scenario of extinction and unprecedented biological diversification that is the focus of my own and Dr. Ceballos's scientific work. Specifically, we have endeavored to document how human action has come to exert a counteracting force on the diversification trajectory of the biosphere, by becoming the agents of what increasingly looks like a new mass extinction, the sixth in the last 542 million years of the Earth's biological evolution. Dr. Ceballos has become the leading voice in the study of extinction, principally of vertebrates. I have sought primarily to understand the cascade of consequences for ecological and human wellbeing ensuing from a process we have termed "defaunation." With the intellectual input of colleagues, students and local communities, and pursuing our love of fieldwork, the two of us have sought to generate the scientific evidence to prove that the crux of the sixth extinction lies not only in the extinction of species, but in the extinction of their populations, whose relentless pace is a prelude to the global disappearance of species. For example, we have shown that, of a representative sample of mammal species, about 50% have seen their geographical range shrink by at least 80% between 1990 and 2015. Even with such a sharp contraction of their physical space, they may not make it onto our lists of endangered species, yet they vividly reflect an anthropogenic pulse of mass population extinction. We have therefore tried to convey that we would not, by definition, be talking about a biological extinction crisis if each species conserved an extant population. But in such circumstances *Homo sapiens* would be very unlikely to survive.

The BBVA Foundation's accolade is an encouragement to us in our efforts to spread the ethical commitment to conserve as much as possible of the biological wealth that accompanies us, that we all depend on and with which we form an indissoluble whole. The award can also help us drive home the message that, since our planet is capable of recovering and engendering unsuspected levels and a fascinating range of biodiversity, even under the impact of mass extinction episodes, the real existential problem lies with our own species. In this way we hope, through our work, to help prevent our descendants from being denied a future.