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Our Vulnerability to Catastrophes and Our Evolutionary Stage are Inversely Related

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Life on Earth initiated approximately 3.6 billion years ago and developed at an amazing rate with divergence to a huge number of marine and terrestrial organisms divided among six kingdoms: Archaebacteria, Eubacteria, Protista, Fungi, Plantae and Animalia. Plantae occupy ~82% of life's biomass on Earth, Fungi are ~2.2%, bacteria are ~12.8%, and animals are less than 0.5% of global life-forms. Plantae includes all organisms able to photosynthesize organic macromolecules (carbon skeletons) from inorganic compounds (water-H_2O, Carbon dioxide-CO_2) and most of them use sunlight as energy source. Due to this ability they initialize 'Food chains' and hence are named 'Primary Producers', actually enabling life for all other life forms including all animals that feed on them as well as on other organisms (ref. 1). The evolution in each kingdom can be depicted graphically by a phylogenetic tree that provides a time perspective on the divergence and ancestors of each species. Analysis of the phylogenetic tree of Animalia reveals that mankind (phylum Chordata, Class Mammalia, Order Primates, and Species *Homo sapiens*), constitutes less than 0.1% of all animals, but is considered the top evolutionary stage, enjoying a relatively large brain potential, exceeding by far that of all other animals, thus enabling remarkable cognitive abilities (matters associated with spirituality, creativity, and issues not directly involved in physiological daily needs). The human superiority had been translated into dominance on Earth and unprecedented achievements as well as of imaginary ideas (e.g., J. Verne; A. C. Clark; I. Asimov), of which some have already been realized. More recently, S. Hawking's ideas about reaching to the stars, or in his persuasive explanation of the need to develop means for evacuation of mankind from Earth due to risks of extinction, provide a good example of an 'imaginary' aspiration that despite limited technological abilities enabling intergalactic voyages, or paucity of an alternative planet that may replace Earth in supporting human life, is still under intensive pursuit (e.g., by NASA). However, despite the anticipation of developing a novel propulsion system to enable such journeys, the discovery of a planet, with Earth's-like gravitation, that orbits a star providing light in the spectrum enabling photosynthesis (ref. 1) is still doubtful, not to say that even a suitable atmosphere and water on surface, may not suffice all needs for human survival (ref. 2). It is quite unfortunate that a discovery of a suitable alternative planet for humanity will most probably remain elusive, at least in the near future, suggesting that in the meantime, humanity should find ways to diminish the man-made threats on its existence (ref. 3). Such steps include restriction of the overuse of natural resources, that expedite destruction of terrestrial and sea environments, while devastating photosynthetic organisms (forests, bacteria and cyanobacteria essential for photosynthesis and hence life), or control of the industrial spills that have intensified extreme weather phenomena, heat waves and ice melting eliciting terrible alterations in climax and sea level. Another risk, that has recently intensified tremendously, arises from threats of using nuclear weapons (e.g., Russia vs. Ukraine; Iran vs. USA or Israel; North Korea vs. USA; Pakistan vs. India), or biological means

(e.g., the Corona pandemic rise at the military laboratory in Wuhan, China; ref. 4) 'to solve' political, religious, or economical conflicts. As these risks accumulate in addition to putative catastrophes beyond human control, like an unprecedented hit by a large asteroid, or by a detrimental irradiating wave arriving from the sun or deep space, or an enormous earthquake that may affect Earth's spin or orbit around the sun, ban sunlight and hence eliminate photosynthesis, or change dramatically the sea level, we are clearly under increasing risks. Logically thinking, such reality should have triggered international efforts to at least reduce the human-provoked dangers, but regretfully, humanity seems to neglect this compulsory problem by enabling ignorant or fanatic leaders to rule despite their selfish aspirations and risky apathetic approach toward the future of mankind (ref. 5). In such a reality an evaluation of our 'survival prospect' in case of a global catastrophic event is undoubtedly timely. From the extinction of the dinosaurs ~65 million years ago, when Earth was hit by a huge asteroid (~10 km wide) in the Yucatan Peninsula of Mexico, we may assume that the impact of a larger or faster asteroid will be almost total destruction of all life forms on Earth, particularly humanity, which on the one hand is top of the phylogenetic tree of Animalia and on the other hand highly vulnerable to apocalyptic events. However, it is still conceivable that some organisms, especially various insect species, or less developed organisms ('simpler life forms') at the the phylogenetic tree, may survive by hiding underground or deep in the sea while maintaining a 'hibernated-like' metabolism as long as the conditions are hostile. In addition, bacteria and algae able to enter into dormancy (kind of latency that maintains only a basal metabolism and energetic requirements), may stay alive until environmental conditions improve, which is particularly apparent for cyanobacteria bearing repair potential of damaged DNA by intensive recombination abilities among their several identical chromosomes. Accordingly, it seems that the 'survival prospect' of highly evolved organisms is poor, while the 'survival prospect' of 'simpler life forms' is more promising, as long as they maintain their cellular functions and homeostatic abilities of preservation of internal pH and functions of cell components. It is plausible that upon extinction of most organisms, these less-developed species may provide the basis of a new evolutionary tree of life, depending on the selective pressures along its development. Thus, it seems that the 'survival prospect' drops in parallel to development of specificities considered (by us) advantageous, such as faster growth, sexual multiplication, or dominance in the plant kingdom, or, brain development and improved cognitive abilities in the animal kingdom. Hence, the current superiority of *Homo sapiens* on Earth, while living at the edge of bearable conditions, may be temporary, or even replaced by a different tree of life, in which the 'survival prospect', calculated over a much longer evolutionary duration, is a key parameter.

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