



Theory of the Non-Clausius Thermal Death

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ABSTRACT

Previously, under the concept of thermodynamics, Rudolf Clausius and his school hypothesized that: The universe is a closed system and natural processes are moving towards a state of balance, in that state, there will be no conversion of thermal energy into other energy, no process of work, all processes will be suspended, the universe will fall into death. People call that hypothesis the "Clausius thermal death". Later, science confirmed that "Clausius thermal death" could not happen, because the universe could not be a closed system. Clausius thermal death certainly does not occur. But currently, the Earth's ecosystem is facing a danger: The living environment is warming. That could lead to another thermal death. Among animal, warm-blooded animals (homeothermic animals) are the group of animals with the most advanced level of evolution. This group of animals includes birds, mammals and humans. The body temperature of this group is in the range of 42°C (birds) - 39°C (mammals) - 37°C (human). The body temperature of warm-blooded animals stays at this temperature range for two reasons. First of all, this temperature range ensures that the enzyme system in the body has high activity. Second, this temperature range is often higher than the environmental temperature in which organisms live. That ensures easier the release of dissipative heat from the body to the environment. In the group of warmblooded animals, the evolutionary level increases in order: Birds → Mammals → Humans. Similarly, body temperature drops from 42°C in birds - to 39°C in mammals - and to 37°C in humans. Thus, the body temperature of warm-blooded animals evolves in a decreasing direction (42°C → 39°C → 37°C). But on the contrary, now the Earth's surface temperature is tending to warm up, at a high rate, about over 1.5 degrees in 100 years. (<https://www.climate.gov/news-features/understanding-climate/climate-change-globaltemperature>; <https://www.iberdrola.com/sustainability/increase-average-temperature-on-earth>). The trend of increasing temperature on the Earth's surface is contrary to the trend of animal body temperature evolution. If this phenomenon persists, it may



hinder the evolutionary path of warm-blooded animals. Or in general, the increase in Earth's surface temperature is hindering biological progressive evolution. That could be a disaster for the ecosystem. We call it the “Non-Clausius thermal Death” disaster.

Keywords: Thermal death, warm-blooded animal, Evolution of body-temperature