

CO₂-CHANGES, PACEMAKER OF THE EVOLUTION

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During the Earth's history massive changes of the CO₂ content of the atmosphere have been observed. The history of the atmosphere of the earth is described with equations that integrate background from chemistry, engineering and geology. Times of accelerated atmospheric change coincide with times of accelerated evolution. Thus together with microbiological evidence, the extremely high gradient of present atmospheric change should be regarded as considerably more dangerous than previously considered: all biological systems are aqueous systems. In these systems CO₂ is soluble. Since CO₂ participates directly or indirectly in many important reactions in cells, the CO₂ pressure in the cell is of prime importance. In systems characterized by low CO₂ partial pressures, such as many microbiological systems, moderate changes of the atmospheric CO₂ partial pressure cause a massive impact on chemical equilibria. Thus for many biological systems, the change(!) of CO₂ partial pressure means a major environmental stress, caused by the close interaction between atmospheric partial pressure and the interior of the cells. This stress forces all species to adapt genetically. Microbiota can adapt much fast to the new situation due to their short life span, resulting in a large number of new species. Statistically among these new species there are at least some that are incompatible with other hitherto existing biota (including macrobiota), i.e. threatening them as pests and diseases. This aspect of environmental change needs more attention.