Equation of Life - Aging As Change of State of Dissipative System at Quasi-Steady State

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Aging is one of the first, important and unavoidable experiences in human life. For the material science there is no fundamental difference between aging of biological system and material system. “Review of relevant data shows that live matter is not differentiated from non-live matter by either entropy or energy state. Life is defined by what it does, not by what it is” [1]. The material changes occurring through aging process of the human are obvious and are well described. There are various theories describing the cause of aging [2-6]. Most of them are purely biological [7, 8]. It seems that the fundamental, real cause of aging as a phenomenon is more likely to be thermodynamic. The aging process is continuous, consecutive change of the state of the biological system caused by the general tendency of entropy to increase [9]. All biological, morphological and structural changes occur as a consequence of the Entropy rise. The same cause forces an object, bacteria and a Human to age. It is the fundamental natural (Thermodynamic) laws that makes us and surrounding objects, and in general, the whole Universe to change the system’s state and to get older. There are two opposite tendencies according to (53) that determinate the state of the biological system. The first one is the universal tendency of any system (live or non-live) to raise its own entropy, and the opposite is the action of an organized biological “machine” to lower the Entropy level and repair the damage accumulated in the system. This is in accordance with previous research [36]. The cell is alive as those two tendencies (processes) are in balance. Efficiency of the biological and chemical “machine“ is never equal to 1. So its inefficiency is the reason of consecutive change in the system’s state and therefore of the aging process. This is also the explanation for the irreversibility of aging process. It is possible to analyze aging processes of biological systems at various levels (molecular, sub cellular, cellular, and at the level of the tissue, organs and organism, population) [10,11]. One thing is the same for all possible level of analysis, and that is the change of the system’s state. Aging is not genetically determined as suggested in “Development, reproduction, and life span are each under independent genetic control” [12]. The reason is that the rise of entropy and consequently aging is not under control of genetic material, but it is the fundamental law that takes the supreme position in nature.

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