

THE THERMODYNAMIC NATURE OF TIME

Mieczyslaw Dobija, Jurij Renkas

Cracow University of Economics, Cracow, Poland

ABSTRACT

David Park, editor and co-author of 'Study of Time' (1972) wrote that 'The passage of time does not need to be explained by physics'. It is a fact that there are great discrepancies in the views of physicists, which do not disappear with the passage of time. For example, David Deutsch questions Isaac Newton's definition of time, especially the fact that time passes evenly. At the same time, he disregards human common sense and Arthur Eddington's warning: '...our intuitive sense of time's passage is so powerful that it must correspond to something in the objective world. If science cannot get purchase on it, one might say, well, so much the worse for science...'

As Immanuel Kant explained time is closely related to human consciousness and mind, so it can be absolute only in the sense that it elapses equally for all modern humans with a normal emotional state. When there is no humanity, there will be no passage of time, but the laws of thermodynamics, gravity and the principle of conservation of momentum will apply.

Time is thermodynamic in nature. Therefore, identification of objects undergoing the process of transformation is required. They are specified by the following definition.

Time is the process of transformation of the stock of primary vital energy of modern man into the ability to perform work, i.e. personal human capital. The rate of passage of time is constant and independent of anything. This rate is determined by the constant $a = 0.08$ [1/year].

According to the term, time passes uniformly at an equal rate. But this uniform rate causes that the effects of transformation are not linear but exponential. With the initial value of the vital energy 1.0, the transformation is represented by the function $Z_t = e^{-at}$ for $t = 0, 1, 2, \dots, 120$, where t - the number of astronomical years, and a - is the constant of the passage of time. At $t = 120$ years, $Z_{120} \approx 0$. Gerontologists point to the number 120 as the absolute end of human life, and this length of life is also recorded in ancient texts. Consideration of the thermodynamic nature of time combined with the achievements of astronomers and scholars who oversee the calendar completes the knowledge of time essential for modern man.

Keywords: thermodynamics, definition of time, constant of time passage, human capital