

HCG035-07

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人間の二重性:「身体という閉鎖系」と制御する「わたし」を統一する「人間の生物学/身心一体科学」

Human dualism: human biology as a solution for unite "I as a thinking being" and "body as closed-ecology"

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Closed-ecology system is useful to understand rules of not only own system of individual biological organism but also a possibility and problems of the mutual interaction. Through consideration of closed-ecology system, common rules of biological organism from a unit to multi-system or different species will be elucidated. We human beings belong to animals, a heterotroph, which is an organism that cannot fix carbon and uses organic carbon for growth. In order to get foods to survive, animals have special system, brain-neuro-muscular system to move in the living environment. Human beings have discovered special method to move on land in the evolution with bipedal waling and running keeping standing posture. However, we have been lived longer with small activities due to utilization of man-made transportation system, and almost forgotten how to walk and run, resulting in happening of fall, osteoarthritis, dementia, especially in aged people. Recent progress of brain and life sciences has shown our biological system is intrinsically organized to survive as in "activity-dependent rule", which governs at various levels of gene expressions, translation, living cell organization, and tissue-communication in our body of multi-cellular biological system. In this presentation, I would like to understand human system from biology ? human biology, considering into both closed-ecology system and self-control. Usually normal and healthy human being as one of animals is excluded in scientific research field, especially aspect of life science of individual human being. Activities are basically essential for our existence individually and also socially and cannot be forced by others. Therefore, dual autonomous ideas of autonomous system obtained in evolution and human spontaneity/emergence including free will are essential for our human living. We should think about how does hierarchical soft structure create spontaneous activity by working with smart dynamics from single macromolecule to human body. Human body is a typical closed-ecology system, only works in a small range of environmental conditions, such as temperature, pH, blood glucose level, mechanical strength like stretch, compression, etc. In addition, human body is controlled by human brain, which not only control our body system but also had created completely different world of nature, virtual world. We should start to study a principle of our life system, the spontaneity/emergence of human body including human brain/mind system. As Professor Fumio Oosawa was inspired by the tracking motions produced by Protista several decades ago, spontaneity is a characteristic aspect of life. A protist can behave with spontaneity resulting in selecting and deciding the comfortable environment for the survival after rushing back and forth. Such characteristics of Protista suggests that a cell exhibits spontaneity as well as individual organisms. Since human beings belong to a multicellular organism, we have at least two levels of spontaneity, both at cells and an individual. In this presentation, we would like to focus on "a real living body" itself and its biological material system, which generates soft and loose structures and changeable shapes, and produces a directional activity, and to extend to both limits of a body, from micro to macro systems. We will start the discussion from the cytoskeleton, which is considered intrinsically to produce cell's spontaneity in our body against the environment, water, and connect to the brain, which has been evolved to control actions in spontaneity in the society where the brain communicates. We have the intention to create a new concept of philosophy of spontaneity and initiative from the basis of principle of biological material science.

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