SYNERGETICS AND COGNITIVE SCIENCE: ENIGMAS, INSIGHTS, PARADOXES

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Synergetics and Cognitology are two (relatively young) fields of science, where D.S. Chernavskii has done a lot. They are similar: both represent an interdisciplinary approach combining study in the fields of neurology, psychology, philosophy, anthropology, computer technology, etc. It is based on a universal language – mathematical modeling. The subject of the study of Synergetics is any complex developing systems, the subject of Cognitology is human thinking. In both cases, the key words are: self-organization, enigmas, paradoxes. In this talk, we discuss several most striking enigmas and paradoxes.

Enigmas and paradoxes of Synergetics:

1. The concept of information is a key one in modern science. Why it lacks of single clear conventional definition?

2. The category of “Conventional/Subjective” information, which includes such concepts as language, code of laws, rules of the road, main stream in science, etc. is perceived either as conventional (with a shadow of “trivial”), or as subjective (with a shadow of ”unimportant”)

These paradoxes were discussed in the book [1], which is paradoxical in itself: it does not always offer answers yet produces an inspiring effect, i.e. it gives the readers an impulse for their own ideas and solutions. In [2], we have revealed (from this book) and presented several (nine) basic theses of Synergetics that provide the possibility to propose solutions to the enigmas of Cognitology:

1. The problem of the “Explanatory Gap between Brain and Mind” (J.Levine, 1983), i.e. the gap in understanding how the physical (material) features of the brain neurons (”Brain”) lead to mental processes (”Mind”).

2. The mystery of Aesthetic Emotions and the perception of masterpieces: why is there a concept of ”masterpiece” (an object of overall admiration), if the perception of art objects is subjective and individual? Why does the subjective perception of a masterpiece cause an objective and observable ”goosebumps” effect?

3. The mystery of the two hemispheres: why is the brain divided into two hemispheres with no apparent differences or specialization?

In this talk, the cognitive enigmas are considered within the framework of the Natural Constructive Cognitive Architecture (NCCA) model, which we have been developing since 2012 to the present. The main purpose of this model is to understand and reproduce the features of human thinking. This model made it possible to interpret intuitive and logical thinking [3,4], sense of humor [5], the nature of insight, the role and mechanism of panic in creative acts and the nature of aesthetic emotions (the perception of masterpieces) [6], the concepts of “Brain” and “Mind” [7,8], and to understand and model the specialization of the cerebral hemispheres [9].

Surely, the NCCA model is based on all the basic principles of Synergetics.