

Conclusion

In this book, we have tried to show that behind words like ‘animacy’, ‘consciousness’, ‘mental experience’, and ‘subjectivity’ there lies hidden a special “ideal element” which chooses the trajectory for the physical body at points of instability, following the fundamental laws of nature.

Here is a summary of our procedure. First, we constructed the mathematical model of a certain psychological process - bipolar choice - and tested the model. Then, we demonstrated that this model corresponds to a chain of ideal heat engines, whose functioning may be used to explain the phenomenon of bipolar choice. In addition, this chain of heat engines explains a number of other psychological phenomena unrelated to bipolar choice. The preceding suggests the hypothesis that the model of an ideal physical object, thus constructed, is linked to the process taking place in the *eidos*-navigator.

Such a hypothesis poses some additional questions. First, is the connection between the chain of ideal heat engines and some phenomena in the mental life of humans and animals only a coincidence? To answer this question, we have to analyze those features of formal theories that convince us their predictions are not coincidental. At the beginning of the twentieth century Niels Bohr constructed a model of the hydrogen atom. He represented it as a solar system consisting of a nucleus - the Sun - and an electron - a planet, which can leap from orbit to orbit and, in so doing, emit or absorb light quanta. This theory would not have been accepted by other physicists if it did not explain complicated patterns in the hydrogen spectrum. So, in saying that the prediction is not accidental, we are concerned not only with its correctness, but also

with its complexity. Does our theory predict complex phenomena? Yes, it does. It predicts the set of harmonical intervals in music, which we obtained by solving Diophantine equations deduced from our thermodynamic model. This set consists of eighteen intervals, fourteen of which coincides with Helmholtz set of intervals.

Second, is the parallel between the mathematical model and the chain of heat engines appears due not to the existence of an *eidos*-navigator, but rather to some real physical process, described by these engines, that takes place in the physical brain of humans and animals? It is difficult to conceive of a heat process taking place in the brain with the significant and controlled changes in temperature required by the model. We may suppose, of course, that there is another physical process, not necessarily involving heat, but described by the same equations and with a different interpretation. Such a process is apparently unknown to science.

Third, does our model not contradict the law of conservation of energy? Before answering this question, let us look at the ontological schemes mostly used for an analysis of consciousness. They are of two types. In schemes of the first type, the physical world is closed causally and energetically. This means that consciousness, by itself, does not have any influence on the physical world. The best example is Epiphenomenalism, in which mental phenomena are viewed as the side effects of physical processes.

Schemes of the second type rely on dualistic frameworks, in which consciousness and the physical world are separate entities and consciousness may influence the physical world both causally and energetically. The physicist Squires (1996), in analyzing such dualistic models, cites Eccles:

All attempts to formulate a dualistic hypothesis on brain-mind interaction are met with the strong criticism that such an hypothesis violates the conservation laws of physics. (Eccles, 1986, p.411)

The hypothesis described in this book is dualistic, of course. But it does not contradict the laws of conservation, because

consciousness influences physical reality only under the condition that the body is in an unstable state at the moment when an infinitely small impact can change its trajectory. Note that the concept of 'infinitely small' has a meaning only in mathematics. Speaking of the physical world, we have to use 'operational unobservability', that is, to consider only impacts that do not reveal themselves in physical experiments.

One more question. Are there physical bodies that are not considered to be alive from the traditional point of view, but are animate according to our criteria? One example is Gaia. James Lovelock (1979) proposed the hypothesis that the Earth is a living organism which maintains stable conditions on the planet suitable for the existence of life. This organism influences non-biological components as well; for example, cloudiness is regulated to maintain necessary temperature for the biological mass. Such planetary processes contain a great number of bifurcation points and unstable zones; thus, in the framework of our hypothesis, the Earth may be considered an animate being.

Another example is the hypothesis that black holes are animate organisms (Lefebvre, Efremov, 2008). The mathematical model of a black hole shows that it has formal analogues for images of the self.

One more example. Attila Grandpierre (2004) proposed the hypothesis that the Sun is a living being.

The above examples relate to cosmic objects. We might also take an object of a much smaller scale, such as a soap bubble. Nonlinear processes take place in its membrane, and their dynamic trajectory contains indeterminate zones, so that it is very difficult to predict the moment when the bubble will burst. Similar behavior is demonstrated by linear and ball lightning.

A final example is the system of cracks in a solid body. This system contains points at which the extension of a crack is not determinate; thus, a system of extending tracks may be considered animate.

One may ask, does the *eidos*-navigator have an implicit goal that influences its choice of a dynamic trajectory? One possible answer: in generating a distribution of probabilities, the navigator aims to increase the number of ramification points and thus its ability to determine the body's behavior without violating physical laws of nature.

To find the nature of animacy is an urgent problem. Probably, it will be solved in the next few decades. The solution, I believe, will lie in the development of a new ontology elaborating the "materiality" of ideal objects.