

George S. Levit: *Biogeochemistry – Biosphere – Noosphere: The Growth of the Theoretical System of Vladimir Ivanovich Vernadsky* (*Studien zur Theorie der Biologie*, Vol. 4), Verlag für Wissenschaft und Bildung, Berlin, 2001, 116 pp. [ISBN 3-86135-351-2]

It would be wrong to claim that the life and work of Vladimir Vernadsky (1863-1945) has not been well investigated. Indeed, the attractiveness of Vernadsky's person and the global character of his theory have made him one of the most popular figures in the history of Russian science. Vernadsky's ideas have found many followers in various circles in Russia today, including biologists, philosophers, experts in ecological problems, etc. The growth of Vernadsky's authority and his influence on various research areas results from his efforts to develop a synoptic theory. Vernadsky's scientific activity embraced a broad spectrum of problems, from very specific discussions in crystallography or biochemistry to philosophical issues such as the origin and meaning of life, the functional principles of living matter, the interaction between humankind and its environment, the future of human civilization, and so on. However, there still remains much to be done to understand in his work more precisely, particularly his later writings.

The book to be reviewed has two different objectives that are both not easy to achieve together. On the one hand, the author wants to reconstruct the genesis and immanent logic of Vernadsky's system. On the other, he tries to relate Vernadsky's concepts for the understanding of nature to those of many other contemporary scholars and thinkers from all over the world.

According to his first objective, Levit provides a summary of Vernadsky's ideas and tries to prove that various parts of his theory and various aspects of his worldview are essentially connected with each other. He divides the theoretical system of Vernadsky into three levels or

blocks – space-time theory, general theory of science, and the theory of the bio- and noosphere. Each chapter of the book deals with one of these problem complexes. While the sequence of chapters shall show the logical structure of Vernadsky's system, the genesis and evolution of his views are demonstrated within each of the chapters.

Stressing the integrative character of Vernadsky's doctrine, Levit demonstrates that it was elaborated on the basis of many specific studies in the particular sciences such that it can be qualified as a set of empirical generalizations. However, Levit points out that Vernadsky's doctrine also includes many speculative elements. That is not only true of his concept of the noosphere, which cannot result from a descriptive-phenomenological research, but also of his concept of living matter. Levit convincingly argues that both Vernadsky's notion of space-time dissymmetry of living matter and his concept of the biosphere as a self-regulating system require general philosophical presuppositions that do not belong to the area of pure science. It is, therefore, not easy to classify Vernadsky's approach in any of the conventional kinds of theories and methodologies.

In fact, the amalgamation of empirical and speculative arguments is a specific feature of the whole theory of Vernadsky. It is rather typical of theoretical constructions that try to achieve a grand scientific synthesis. In this regard, Levit's analysis of Vernadsky's theory of science is particularly interesting. He points out that Vernadsky's naturalistic view on the development of scientific thought as a natural process allowed him to treat his own theory as an immediate manifestation of natural laws. Thus, Vernadsky tended to formulate a closed, self-encompassing theory that even explains its own existence.

As to the second objective, relating Vernadsky's concepts to that of other contemporary thinkers, Levit compares Vernadsky's theory of the biosphere with that of Pierre Teilhard de Chardin and with James Lovelock's Gaia theory.

Furthermore, he analyzes Vernadsky's critical reception of the philosophies of Henri Bergson and Arthur Eddington, both of which he considers evident in Vernadsky's theory of biological time. Finally, in Vernadsky's methodological reflections, Levit recognizes direct influences of positivism Ernst Mach's radical empiricism. Exploring these various contexts of Vernadsky's theoretical constructions is a great advantage of Levit's book. However, Levit pays relatively little attention to the historical context of Russian philosophy. Despite the fact that Vernadsky was first a natural scientist, he had strong philosophical interests and was familiar with topics of contemporary Russian philosophy of the so-called 'Silver Age'. That concerns first of all his idea of the noosphere.

Levit is right when he criticizes Vernadsky's inconsistency in presenting the idea of the noosphere as a consequence of his analysis of the nature of living matter. However, it is not enough to say that the idea of the 'inevitable transition of the biosphere into the noosphere' is not a scientific concept; it would also be useful to show its sources. The overall intention of Vernadsky's theory of the noosphere is closely related to utopian views of the future of humankind in Russian cosmism (e.g., by Fyodorov, Tsiolkovsky, Gorsky, and Setnitsky), to various attempts at building a general systems theory (e.g., the so-called 'tectology' of Alexander Bogdanov), and to the technocratic enthusiasm of Russian Marxist thinkers. Although it is sometimes difficult to demonstrate a direct reception of these ideas by Vernadsky, his diaries and letters, which have not yet been fully published, could provide new evidence.

Thus, what Levit calls 'Vernadsky's inconsistency' is not only an internal problem of Vernadsky's method but also a manifestation of a general trait in 20<sup>th</sup>-century science. Indeed, searching for a theory that could provide a scientific basis to certain value preferences is a typical phenomenon of that period. Many peculiarities of Vernadsky's system are

related to the complicated interactions between the natural sciences and their historical and cultural context. Evidently Levit undervalues the significance of these interactions. Since he undertakes his reconstruction mostly by means of texts published by Vernadsky himself, he shows us hardly more than the tip of the iceberg.

Nevertheless, Levit's study provides a new impulse for the reconsideration and reinterpretation of Vernadsky's theoretical heritage. It is a very good introduction to reading Vernadsky. The bibliography can help readers find their own way through further studying Vernadsky's works. Although the index is not complete, it mentions all the essential sources and literature about Vernadsky. While Vernadsky's works are still less known outside of Russia, the book could help western intellectuals gain a more adequate idea of Russian thought in the 20<sup>th</sup> century. Levit not only provides a correct summary of Vernadsky's main ideas, but also shows cardinal shortcomings of his system and tries to evaluate its relevance to the modern discussions about global problems of humanity. Levit's view is far from being apologetic about Vernadsky's theory, which is unfortunately widespread among many Russian followers of Vernadsky. That makes the book also interesting to the Russian public, so that a translation into Russian it would be a very useful task.

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