La mer 33, 237–238, 1995
Société franco-japonaise d'océanographie, Tokyo

Book review

Scientific thought as planetary phenomenon

V. I. VERNADSKY, 271 pp. Nauka, 1991 (in Russian)

Vladimir Ivanovich VERNADSKY is a famous Russian geologist and geochemist. In spite of official recognition of his scientific merits – e.g., one of the largest Moscow avenues was named in his honor – his works on biosphere evolution became available to the mass reader only recently. This book prepared for publication by the Russian Academy of Sciences takes a particularly important place in his creative heritage. Written at the end of his life, this book is a generalization of his scientific research experience relative to the fate of human civilization.

A key point of the book is that civilization is a form of a new geological force – scientific thought – performance. VERNADSKY supposes that since civilization corresponds to geologically developed organization of the biosphere, it can not cease and destroy itself. He writes: "Noosphere – biosphere transformed by scientific thought, prepared by the process which was lasting hundred millions, maybe billions, of years and which have created *Homo sapiens faber* – is not a short – lived and transient geological phenomenon."

Proving this thesis, VERNADSKY clearly distinguishes ideological and scientific aspects of the problem. He emphasizes that although the perceptions of the world are overfilled with religious, philosophical and social constructions (which more often than not contradict to those which are scientifically recognized, but which are nevertheless taken into account by some researches), the supremacy of scientific thought always exists. He indicates that unlike opinions, reflecting the range of individualities, scientific conclusions are obligate, because they reflect reality and do not depend on our will, and concludes that due to this reason other perceptions gradually retreat if they are inconsistent with a scientific one.

At the same time VERNADSKY recognizes that a scientific construction, as a rule, is not a logically strict, rationally determined system of knowledge. He defines science as manifestation of life, rather than of logic: "Scientific thought – scientific creative work – scientific knowledge are going in the grounds of life, to which they are closely related, and by means of their existence they induce manifestations in the sphere of life, which are not only disseminating scientific knowledge but also creating the countless form of its revelation, inducing countless large and small sources of scientific knowledge." But he specifies that part of science – the mass of scientifically established facts – remains generally obligate.

The facts used by VERNADSKY in his reasoning – completely populated biosphere, impetuous development of science and technology, anthropogenic acceleration of geological processes – are presently sources of trouble rather than encouragement. The second half of the 20th century has shown that imbalance between the level of social organization and the level of technology puts civilization at the edge of catastrophe. VERNADSKY recognizes this danger, but considers that instability that appeared in the course of the transition from biosphere to noosphere is not very significant. He explains his proposition with the following observation: "Science, as a matter of fact, is spontaneously interfering in government activity and, ···getting the more leading position." At the same time, he emphasizes a lack of governmental forms for solution of intergovernmental problems related to financial aspects of the creation of the noosphere. Modern trends of international relations are in a good agreement with the prediction of VERNADSKY that approaches promoting the transition to noosphere will appear through the increasing influence of science, although many of them: United Nation Environmental Program, Intergovernmental Panel on Climate Change, etc. – originated from the awareness of the need to maintain the biosphere rather than of the need to create the noosphere.

The continuity of scientific development is a

fundamental point of VERNADSKY's argument: "Nowhere – among the wars, destruction, dying from diseases and killings–we see weakening of scientific movement. All the losses are rapidly reimbursed by powerful boost in practical implementation of scientific achievements and in organization of government and technology on the scientific basis. It seems sometimes that in this turnover of people's unhappiness science grows more fast and that it has all the means for stopping any attempts to establish a barbarous society". "The cause for continuous, independent from social and political factors, development of world science (according to VERNADSKY) is that" government life in its basis is more deeper and more stronger occupied by scientific achievements and increasingly depends on science in its power"; in other words the government which promotes the larger amplitude of scientific activity "reaches the maximal power in the noosphere." It is easy from here to come to the conclusion that development of science – due to natural geopolitical competition of governments – is both a sustainable and irreversible process, at least while countries pretending to have a unique role in the world community exist.

Today, especially in the case of Russia, we can see, that social and political changes may, nevertheless, lead to decline of scientific activity. The logic of VERNADSKY's reasoning explains this phenomenon: the decline of confrontation between the states inevitably decreases the state demands for science as a source of economical and military power. Extrapolating this way of reasoning, one might come to the conclusion that the prerequisites for growth of science gradually disappear over the course of strengthening unity of humankind. However, VERNADSKY did not go so far. As a naturalist, he derived conclusions from the tendencies that were obvious in his time. His prediction that science's interference in society will result in a decrease in the confrontation between the countries and in the appearance of intergovernmental bodies for resolving the biosphere problems is now realized. Whether it means that science having done its duty should quietly leave social life, or new social mechanisms for sustaining science as a geological force will appear, we wait to see. Modern science will find the answer to this question eventually. The book of VERNADSKY provides an excellent model how to do this within the frameworks of the methodology of natural science.

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