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Galina Jasečková

Comenius University Bratislava
4, Mlynske luhy, Bratislava, Slovakia, 82105
E-mail: galina.jaseckova@fses.uniba.sk
<https://orcid.org/0000-0002-3699-8082>

Milan Konvit

Comenius University Bratislava
4, Mlynske luhy, Bratislava, Slovakia, 82105
E-mail: milan.konvit@fses.uniba.sk
<https://orcid.org/0000-0002-4959-7819>

Lukáš Vartiak*

Comenius University Bratislava
4, Mlynske luhy, Bratislava, Slovakia, 82105
E-mail: lukas.vartiak@fses.uniba.sk
<https://orcid.org/0000-0002-9735-5945>

*(correspondent-author)

Vernadsky's concept of the noosphere and its reflection in ethical and moral values of society

***Abstract.** The paper assesses the topicality of Vernadsky's concept of the noosphere, coined over almost twenty years starting in the early 20th century. Emphasizing the uniqueness of Vernadsky's concept of the noosphere as the transformation of the biosphere by a man using reason, we concentrate on the assessment of the utopian or realistic nature of his vision of the future of humanity. Based on the philosophical case-studies analysis, it identifies the ideological roots of the noosphere concept, the development of views on the concept in time, the role of reason and scientific thinking, the opinions of its supporters and critics, and Moiseev's related concept of co-evolution. We point out the correlation between Vernadsky's concept of the noosphere and Moiseev's bifurcation and his two imperatives as necessary conditions for the co-evolution of nature and man. We document that Vernadsky did not only think about the positive role of reason in the creation and development of the noosphere, but he was also aware of the possibility of its misuse. We compare Vernadsky's idea of the collective reason creation with Kurzweil's concept*



of technological singularity, Crutzen's concept of the Anthropocene, Haff's concept of the technosphere and Cer's scenario of the possible future development towards the creation of tech subjects and the replacement of the biosphere with the technosphere. We also assess the possibility of approximating essential concept-forming elements, i.e. philosophical categories, collective reason, the collective intelligence of humanity, and scientific knowledge facilitated by information and communication technology. Ultimately, conclusions concerning the topicality of Vernadsky's concept of noosphere are formulated. We argue that Vernadsky's concept of the noosphere is timeless and should be taken not as a utopia but, on the contrary, as a scenario of possible development along the line of geosphere – biosphere – noosphere, prospectively with its transfer to the cosmic dimension.

Keywords: *biosphere; noosphere; co-evolution; scientific thinking; ethics*

Introduction.

The concept of the noosphere (see Appendix A, 1) conveys an extraordinarily complex and contradictory phenomenon for science, philosophy and culture. Its authors believed that human reason, in the form of a planetary geological force, will lead to more perfect forms of existence (Fuchs-Kittowski & Krüger, 1997; Rezhabek, 2008; Oldfield & Shaw, 2013; Hamilton & Grinevald, 2015). Regarding the original idea of the noosphere, it is especially the concepts of Vernadsky and Teilhard de Chardin that have been subject to discourse over the long term. While Teilhard's noosphere is firmly rooted in the existence of God's intention, Vernadsky's concept of the noosphere is created along a trajectory of geosphere-biosphere-noosphere as new quality, i.e. “biosphere processed by scientific thinking” (Vernadsky, 2004, p. 277). In the light of current global challenges concerning the planet's ecosystem, Vernadsky's concept is being increasingly discussed, not only in Russia (Trubetskova, 2010; Ursul, A. D. & Ursul, T. A., 2020; Palagin, Kurgaev & Shevchenko, 2017; Fesenkova, 2019;), but also worldwide (Hamilton & Grinevald, 2015; Grinevald & Rispoli, 2018; Ronfeldt & Arquilla, 2018; Liseev, 2020). The philosophical foundations of Vernadsky's noosphere consist of collective/global reason, collective intelligence, and global scientific thinking (Vernadsky, 1926, 1945, 2004).

This paper aims to analyse the essential attributes of Vernadsky's concept of noosphere, its development over time, as well as the possibilities of approximation of its essential concept-forming elements – philosophical categories of collective reason / collective intelligence of humanity and scientific knowledge facilitated by ICT. It is organised into introduction, philosophical case-studies, results and discussion, and conclusions. Based on a case-studies analysis of polemical, critical and concept-developing papers on noosphere, we formulate conclusions regarding both the degree of its reality (or utopianism), its topicality and openness to new knowledge and its compliance with Christian values.

Ideological roots of the concept of noosphere.

Although the neologism noosphere was coined in Paris in 1927, some ideas on integrity and harmony of the universe, on the interdependence of micro and

macroworlds, the essence of the world, the structure of matter, the cosmic nature of life and reason, the need for man's spiritual and moral improvement had been discussed long before in philosophy, theology, art and mythology. Some examples are Akasha in Indian cosmology, Logos in the teachings of Heraclitus, Plato's Eidos, Spinoza's Nature naturans, Popper's Third World (see Appendix A, 2), etc.

Vernadsky's concept of noosphere represents a positive view of the role of reason, scientific thinking, and social activity of people in the transformation of nature. It was mainly shaped under the influence of the Russian cosmism (see Appendix A, 3), in which it is possible to trace naturally scientific, fantastic, utopian, realistic, religious, and poetic buds of the idea of the noosphere (Krichevsky, 2008; Bondareva, Semaeva & Moisejkina, 2018).

Although both Vernadsky and Teilhard de Chardin have contributed differently to the content of the noosphere concept, there are also common points that connect them (Levit, 2000, 2000a). While Teilhard de Chardin presupposes the formation of the noosphere independently of human actions, Vernadsky (2004, p. 240) understands the origins of the noosphere as an objective continuation of the evolution of the biosphere influenced by scientific thinking and the reason the humankind. He views the inception of intelligent life as part of the biogeochemical process taking place in the evolution of the biosphere on the Earth: “Scientific thinking is a part of the structure of the organisation – the biosphere... its creation in the evolutionary process of life is an event of utmost importance in the history of biosphere and the history of planets” (Vernadsky, 2004, p. 381). However, at the same time, he also highlights the importance of morality, ethics and collaboration of humans in preserving the future of humankind (Vernadsky, 1965; Levit, 2000, pp. 165–167; Hamilton & Grinevald, 2015, p. 8).

Vernadsky's concepts of biosphere and noosphere.

Vernadsky defines the biosphere (see Appendix A, 4) as “a geological envelope of the Earth of finite size, significantly different from all other geological envelopes of our planet”, which “separates the planet Earth from the cosmic medium”. The biosphere (see Appendix A, 5) is metaphorical “rational mantle of the Earth”, and living matter gives the biosphere “specific character, unique in the universe” (Vernadsky, 1944, p. 488). His biosphere concept has got two dimensions – naturally scientific (biogeochemical process as a driver of evolution) and philosophical (planetary evolution, the concept of unity of living and inert matter). The biogeochemical process is characterised by “a special spatial natural phenomenon, where space is not geometric, and time is, does not manifest itself in the form of the fourth coordinate, but in the form of a change of generations” (Vernadsky, 1965, p. 201). At the philosophical level Vernadsky's biosphere is a specific biological form of mass motion, in which billions of tons of matter are transformed. At a particular stage in the biosphere's evolution, humans inevitably emerge, equipped with reason. Living and inert matter together form the system of the biosphere. Humanity and the natural environment together form the system of the noosphere. Humanity – the Homo sapiens – Faber species is the driving force to transform biosphere to noosphere: “Humanity as a whole is becoming a powerful geological force” (Vernadsky, 1965,

p. 328). Vernadsky presents the noosphere as a state that has already existed: “The biosphere has moved or gone to a new evolutionary state, the noosphere” (Vernadsky, 1988, p. 30) and as a state that is to be: (entry into the era of noosphere). “The biosphere has passed or rather is passing into a new evolutionary state called the noosphere. It is processed by the scientific thinking of social humanity” (Vernadsky, 1988, p. 30)... “The biosphere will inevitably pass one way or another, sooner or later into the noosphere...” (Vernadsky, 1988, p. 46).

The transformation of the biosphere to the noosphere is inevitable, resulting from an objectively ongoing evolutionary process. It is “... the last of many stages in the evolution of the biosphere in geological history” (Vernadsky, 1945, p. 10). The transformation of the biosphere into the noosphere “is an inevitable geological process” (Vernadsky, 2004, p. 335).

Moreover, there is no coincidence in evolution: “... in the paleontological development of organised beings; there is a certain direction and the emergence of reason, consciousness, governing will in the biosphere – the basic human manifestations – it cannot be accidental” (Vernadsky, 1993, p. 297). Vernadsky's first biogeochemical principle of the ability of living matter is, under optimal conditions, multiplying indefinitely, as he defines it as “Biogenic migration of atoms of chemical elements in the biosphere always strives for its maximum expression”. Biogenic migration of atoms is associated with the activity of living organisms (Vernadsky, 1965, p. 283). According to the second biogeochemical principle on the direction of the evolution of organisms, “evolution of species during the geological time leading to the creation of life forms stable in the biosphere goes in a direction that increases the biogenic migration of biosphere's atoms” (Vernadsky, 1965, p. 283). According to the first principle, living matter strives for the maximum attack on inert matter. It can be conveyed as a code of life/living matter aggression towards the biosphere. The second biogeochemical principle determines the direction of evolution – evolution proceeds in a direction towards the origin of a species, which has the most remarkable ability of biogenic migration, i.e. towards the most aggressive species. Humans are such species, equipped with human brains and work (Fesenkova, 2018, pp. 10–11). It follows that, there is an organisation created by living matter in the system of nature, and, at the same time, there is an effort to destroy any organisation in the same living substance that forms the organisation. The contradiction eliminates the origin of a man as the bearer of reason.

The idea of the noosphere is, assuming the unification of humanity by the power of scientific thought, a construct directed against the laws of life aggression, in which the role of reason is fully manifested: “... at the beginning of the 20th century, a force appeared in a clear, true form, enabling the unification of humanity – scientific thinking... This is a force of geological nature made ready by billions of years of life's history in the biosphere...” (Vernadsky, 1988, p. 69).

Vernadsky viewed human reason as an element of the organisation of nature. It can transform nature and unite humanity and create an ideal society promoting the idea of harmony between man and nature (Fesenkova, 2013, pp. 138–146) and eliminating the danger of the ecological crisis. Vernadsky believes that reason is inscribed in

evolution, evolves according to its laws, and fulfills its goals. It follows that the noosphere's formation as a natural phase in the evolution of the biosphere is irreversible. According to Vernadsky, reason is the highest degree of rational and purposeful force that organises nature. The reason must improve its habitat according to the laws of evolution and transform the biosphere into the noosphere (Vernadsky, 1965). His interpretation of man's role in the creation of the noosphere is not built on the scientific understanding of the objects under investigation but on a clearly defined philosophical position – ontological idea of the structure of the universe. Man is a product of nature, the result of its long development, during which the most fantastic phenomenon came to exist – human reason. Vernadsky's concept of the noosphere, based on declaring the decisive role of human activity and reason in the transformation of the biosphere, represents a model of possible development, based on humanity's ability or will to act rationally, on a planetary scale. According to Vernadsky, *Homo sapiens* need to be rational not only according to one's evaluation, but also following the ideals of good, justice, beauty, and reason: “For the first time, a man truly understood that he was an inhabitant of the planet and may – must think and act in a new aspect, not only in the aspect of the individual, family or clan, states or their alliances but also in the planetary aspect” (Vernadsky, 2004, p. 262).

The task of the noospheric man is to use reason to preserve all the qualities of the biosphere necessary for the survival and development of humankind. A metaphor about the noosphere as a kingdom of reason (Vernadsky, 1988, p. 127) seems to give an exclusively positive connotation to reason. However, Vernadsky points out that man's role is to use reason to preserve all the qualities of the biosphere necessary for the survival and development of humankind. The transcript of his lectures about the results of his thirty-year reflections on the role of human consciousness (reason) as an ontological category and active factor in the development of the biosphere, which influences the course of natural processes (Nazarov, 2008, pp. 74–75) is crucial. Here, we can find a statement about the possible divergence of the direction and intensity of technological progress of the humankind and the development of natural processes in the biosphere (see Appendix A, 5). Evil is a current phenomenon in the noosphere as good is: “... the biosphere knows neither good nor evil ...”. The question of the moral side of science – regardless of the religious, state or philosophical expression of morality – is becoming an effective force and will have to be reckoned more (Vernadsky, 2004, p. 342). We can see it in misuse of reason and the results of scientific thinking, corresponding to Heidegger's concept of *Gestell*, according to which “Everything is ordered to stand by, to be immediately at hand, indeed to stand there just so that it may be on call for a further ordering... We call it the standing reserve (*Bestand*)... Whatever stands by in the sense of standing reserve no longer stands over against us as an object. We now name that challenging claim which gathers man thither to order the self-revealing as standing-reserve: *Ge-stell* (*Enframing*)” (Heidegger, 1977, pp. 17–19). Therefore, today, technology is becoming a force that is moving nature into the position of standing reserve – *Bestand*.

Results and discussion.

It should be emphasized that Vernadsky describes his concept's implementation possibilities very carefully: "... the creation of the noosphere from the biosphere is a natural phenomenon that is inherently deeper and stronger than human history. It requires the expression of humanity as a unified whole... It is a new stage in the planet's history that does not allow to use its historical past for comparison without any changes" (Vernadsky, 2004, p. 262).

However, this raises the question of to what extent the biosphere should be transformed by human reason to make a qualitative leap from the biosphere into the noosphere (Liseev, 2020, p. 27). So far, it seems that the noosphere creation process, according to Vernadsky's concept, is replaced by the process of creation of the technosphere. The technosphere is an environment created by humanity that (see Appendix A, 8) "... objectively exists and develops as an artificial autonomous global system of technical reality outside the Earth's biosphere" (Krichevsky, 2017, p. 156).

Man is probably not yet morally prepared to take responsibility for the state of the natural environment and the co-evolution of society and nature. For example, Moiseev (1990, pp. 262–263) attached particular importance to the man's benevolent attitude towards himself and the ambient nature. In his view, the principle of benevolence "should form the basis of the moral imperative and the whole system of education" of man.

Therefore, the noosphere concept must correlate with the ongoing processes on the planet. The degree of harmony between the needs of socio-economic development and the possibilities of nature indicates the degree of approximation to implementing the noosphere concept (Moiseev, 1995, pp. 211–212). Ursul (2014, p. 1507) notes that "the noosphere is a materialistic and idealistic formation, in which reason/mind (or wisdom) in various forms is the dominant factor, but above all in the form of a global collective noospheric intellect". Moreover, Ursul A. D. & Ursul T. A. (2020, pp. 69–77) highlight that "preservation of the biosphere and survival of mankind is the cardinal purpose of the transition to sustainable development... In the near space future, mankind will have to massively ship the production of energy and materials outside the planet".

According to Duvigneaud (as cited in Plotnikova, 2004, p. 79), we "... have turned our attention to the noosphere... the after us, the flood policy must be stopped, and our efforts must be united to take effective measures to make reasonable use of the biosphere's resources. And then what reasonable people call utopia today will become a reality tomorrow".

From its inception, Vernadsky's concept of noosphere has been subject to criticism by several authors not only from the former Soviet Union, such as Kuttyrev, (1990, 1996), Pozdnyakov (2003), Zavarzin (2010), Borejko (2013) but also Viner (1995), Levit (2000), Borejko, (2001). Vernadsky has been reproached for its utopianism, exclusively positive direction of reason and failure to respect the facts.

The utopianism of the concept as such: the concept of the noosphere is "a utopian and scientifically unsustainable idea" (Viner, 1995, p. 90), "The noosphere as harmony – is a scientific analogy of such socio-political utopias as the likes of communism and

other, earlier dreams of paradise... We need realistic hopes, functional utopias... These hopes and utopias must be distinguished from the illusions arising from the hope of the boundless power of reason as logos...” (Kutyrev, 1996, p. 154). In Kutyrev's opinion, there are axiological and ontological approaches intertwined in the noospheric teachings without further definition and the value characteristics of noogenesis are presented clearly in a positive manner, which contradicts the dialectic of life (Kutyrev, 1990, p. 4). According to Stilmark, “the idea of the noosphere, the idea of a harmonious fusion of nature and society, is in principle deeply idealistic and now utopian” (Stilmark, 2001, p. 11), and according to Levit the concept of the transition from the biosphere to the noosphere cannot be considered scientific (Levit, 2000a).

The utopianism of the idea of an exclusively positive direction of reason: the basis of the doctrine of the noosphere is the idea of controlling the biosphere's transformation by reason. In reality, however, the man is inside nature, and the man cannot control nature – the man does not know the goals of evolution and pursues a different, selfish goal: to adapt nature to himself. The idea of the noosphere represents only “insufficiently substantiated utopian provisions on human omnipotence” (Pozdnyakov, 2003, p. 11).

Failure to respect the facts: “the human reason is objectively weak... it is not gifted to predict the possible negative consequences of major scientific discoveries and their use” (Borejko, 2013, p. 142); “the flow of information processed by natural biota in biotic regulation is twenty orders of magnitude higher than the flow of information processed by modern civilization” (Gorshkov, 1996, p. 137).

A refinement of Vernadsky's concept of the noosphere is found in the concept of co-evolution by Moiseev (1999, 2000, 2001) as coordinated, tolerant and equal simultaneous development of various components of the ecosystem, in particular, human civilisation and nature. Moiseev sees the matter in the scope of co-existence of a self-organising universe and humanity: the universe is an infinitely complex interconnected organism, and humanity, endowed with reason, is one of its subsystems. The reason is a cosmic phenomenon, but as such, “... it is not able to make planetary process controllable” (Moiseev, 1999, p. 271). Moiseev developed the concept of the noospheric future of humanity and its inner concept of a new morality, i.e. the morality of the noosphere. He interprets morality and ethics not as a rigid set of rules but as an appeal to man's conscience and knowledge. The nature of a person's decisions should be determined by one's creativity combined with mercy and love of neighbour. In this context, he introduced the notion of the noosphere era as a stage in history in which collective intelligence, collective will, noospheric morality and ethics can ensure the co-evolution of nature and society. According to Moiseev, the concept-forming elements include the concept of global bifurcation (see Appendix A, 6), the concept of ICT as a catalyst in the process of the emergence of collective intelligence, and the concept of society's development at a varying rate and development of the logic of nature (Moiseev, 2001, p. 19). There have been two bifurcations in the history of planetary evolution: the origin of life and the origin of reason. The formation of the collective reason of humanity will be the third bifurcation in a row (Moiseev, 2001, p. 116).

According to Moiseev (1988, 1990, 1990a, 1993, 1995, 2000), the limits for human intervention in the biosphere are set by the so-called ecological imperative, which sets “that limit of permissible human activity which one has no right to cross under any circumstances to avoid destroying the biosphere's self-organisation mechanisms... does not depend on the will of an individual, but is given by the relationship among the characteristics of the natural environment and the physiological and social characteristics of the *Homo sapiens* species” (Moiseev, 2000, p. 79).

The role of human reason is also stressed in the Anthropocene concept: “Anthropocene, the current epoch in which humans and our societies have become a global geophysical force”. (Steffen, Crutzen & McNeill, 2007, p. 614). Similarly, Haff's concept of the technosphere raises important questions regarding human agency and the controllability of large-scale technologies, as well as the role of technology in the interrelation between human societies and other parts of the Earth system. the technosphere follows some physical law or quasi-autonomous dynamics, such as the principle of maximum entropy production (Haff, 2014).

Popkova (2014, pp. 311–312) added that rather than the transforming biosphere, it is the universe as a whole that is the critical system of evolution. Suppose the regulatory and compensatory-relaxation functions performed over vast biological diversity. In that case, its information content ensures the stability of the biosphere, then noospheric intelligence will ensure the process of human adaptation to the biosphere (Ursul, A. D. & Ursul, T. A, 2015, pp. 35–37).

The current noospheric discourse places the harmony of the evolution of man, society, and nature and their safe and long-term joint development in the forefront (Moiseev, 2000; Griffen, et al., 2022).

Disputes around Vernadsky are inevitable, but they are useful only in that if they lead to a more thorough comprehension of the views of the scientist (Vernadsky, 2000, p. 768). The rejection and criticism of the concept of the noosphere can be explained by several reasons, both scientific and ethical. One of the main objections to the supporters of the noosphere seems to be the indisputable fact of the destruction of the biosphere by reasonable humans. The existence of reason does not automatically ensure its proper use in favour of co-evolution: a required paradigm shift is a complicated process, and humanity will agree to it in critical situations only. Morality, however, is an expression of the human path to the good. This includes the ability to sacrifice one's interests to benefit the wider community. It is not easy to motivate individuals to do so in a situation where fundamental problems require a change in the approach of the human community as a whole. Suppose the development of society is determined primarily by economic factors. In that case, the gap between the technological capabilities of society and the level of its intellectual responsibility for the biosphere will widen even further. The basis of action according to the noospheric morality is unconditionally good. The experience of touching universal values that guide a person's behaviour is at the heart of such behaviour, no matter the consequences.

On the outside, the concept of a global reason of humanity appears to be the most utopian element of Vernadsky's concept of noosphere. Based mainly on the ideas of

John Lawrence LeCont (psychozoic era), James Dwight Dan (cephalisation), A. P. Pavlov (anthropogenic era), Vernadsky (2004a, p. 476) wrote: "... the evolution of living matter is going in a certain direction". It places the origination of the noosphere in correlation with the origination of reason: "the reason is a complex social structure... Its change is the main reason that ultimately led to the transformation of the biosphere into the noosphere..." (Vernadsky, 1988, p. 133). The global reason of humanity acts as a harmoniser of social and biospheric relations. Moiseev and Frolov see the essence of Vernadsky's concept of the noosphere in the provisions concerning harmonious development of society and governance by the organisation of the biosphere (Moiseev & Frolov, 1984, p. 39). Such development represents a higher quality, created by the synergic effect of biological evolution and scientific knowledge. "The main geological force that creates the noosphere is the growth of scientific knowledge" (Vernadsky, 1988, p. 49). "From the surrounding life, scientific thinking takes over the material that it transforms into the form of scientific truth. It is a spontaneous reflection of a man's life in the environment that surrounds him – in the noosphere" (Vernadsky, 1988, p. 53). Without the emergence of the human brain, there would be no scientific thinking in the biosphere, without which there would be no geological effect either – the restructuring of the biosphere by humankind (Vernadsky, 1988, p. 59). At a certain stage of this evolution, a man equipped with reason inevitably arises, and thus cultural biogeochemical energy, which together creates the conditions for the formation of the noosphere: "This new form of biogeochemical energy ... is the form of energy that currently creates the noosphere" (Vernadsky 1988, p. 132). The collective reason, defined as one that integrates the minds of individual people, provided that they retain their individual consciousness, is here a prerequisite for further noospheric development and its outcome. Moiseev explains the possible origin of collective reason using an analogy to the source of the human neural network. Suppose an increase in the number of neurons in the brain of a living creature once led to the emergence of consciousness having properties that are not only a simple sum of the properties of the individual neurons. In that case, a similar process might lead to the emergence of collective reason. The role of neurons will be played by individual human minds and artificial information systems: "Collective reason is a systemic property of a set of individuals who have (their own) reason and ability to exchange information" (Moiseev, 1993, p. 48). The emergence of selective intelligence of humanity is another conditional factor of humanity's transition to the co-evolutionary path of development of society and nature (Moiseev, 2001, p. 116). "If my hypothesis is correct, one day there will inevitably be a qualitative change in the position of collective reason (see Appendix A, 7) in the planetary organisation of mankind" (Moiseev, 2000, p. 89). In addition to the possibility of the emergence of collective reason and/or intelligence through biological evolution, the contours of its emergence in an alternative (technological) way are beginning to appear today, thanks to the development of knowledge and ICT (Tegmark, 2020).

As far as the role of technology and especially ICT in implementing the noosphere concept is concerned, Kurzweil (2005) argues that technology has functioned from the very beginning as a geological force having an intensity that increases exponentially

over time. His concept of the emergence of a technological singularity assumes that the capabilities of the human brain will be surpassed shortly: “The Singularity will allow us to transcend these limitations of our biological bodies and brains” (Kurzweil, 2005, p. 9). By the mid-2040s, computer-based intelligence will significantly exceed the total human brainpower (Kurzweil, 2005, pp. 135–136). According to Floridi (2019, p. 113), the penetration of ICT into people's lives caused the onset of the so called Fourth Revolution, the effects of which are reminiscent of the concept of global reason: rather than isolated Newtonian subjects people are now information organisms (inforgs), interconnected (also with other types of information organisms) and rooted in the information environment (infosphere). As for the future development, Cera (2017, p. 268) holds the opinion that technology will displace nature from the position of the natural environment of man: “Technology emerges as the possible oikos for today's humanity”. Moreover, technology will create the pressure for the emergence of an evolutionarily new post-human subject: “a man completely adapted to the technological neoenvironment... who is totally fused with his vital space...” (Cera 2017, p. 269).

The Internet and ICT, in general, are often presented as technological approximations of the concept of noosphere. In general, Wikipedia and online collaboration platforms and social media are presented as the first swallows of the approximation of collective reason, i.e. noospheric intellect. At the abstract model level, an analogy between the self-evolutionary model of the neural network and the collective reason is presented. According to this analogy, collective reason (or consciousness) can develop much faster than the reason (or consciousness) of the individual (Sulejmenov et al., 2013, p. 89).

Conclusions.

As one of Vernadsky's quotations states: “The kingdom of my thoughts is yet to come” when formulating conclusions about the degree of realness or utopianism of the noosphere, one must take into account that the time of its implementation is measured on a scale of tens of human generations. Therefore, nowadays, it is not possible to speak unequivocally about its confirmation or non-confirmation. In this context, there are two critical statements by Vernadsky analysed below.

“Humanity as a whole is becoming a powerful geological force. And before it, before its reason and work stand the challenge of restructuring the biosphere in the interests of broad-minded humanity as a whole” (Vernadsky, 1988, p. 509). “... geologically, we are now experiencing the exclusion of the kingdom of reason from the biosphere, which will radically change both its appearance and its structure into the form of noosphere” (Vernadsky, 1988, p. 127).

Indeed, we can also find some value judgements in his notions of the noosphere, hypotheticality, an absence of a unifying, deeply substantiated concept, and a coherent theory of the biosphere's transformation into noosphere. Many of Vernadsky's statements on the noosphere are accompanied by remarks such as “I will come back to this in the future”.

Rather than a holistic and profoundly developed concept of noosphere, it is an outline of such model of biosphere's evolution that would take the action of humanity as a global geological factor fully into account. However, it is not clear how it would be possible to regulate the impact of human activity on the biosphere effectively. That is why the existence of conflicting evaluations of his concept of the noosphere is not accidental at all (Liseev, 2020, p. 26).

Vernadsky hoped that humanity would be spiritually transformed and guided by scientific ideas and high moral principles. His concept of the noosphere coincides with the need for a new morality, new rationality, and a new noospheric humanism (see Appendix A, 9). Man will move forward the process of his spiritual evolution, which will result in the formation of noospheric consciousness as a process of spiritual asceticism.

The structure of a noospheric society will be determined by the principal contradiction of the noospheric evolution – the controversy between the spiritual and material components of civilisation's life. This contradiction can be resolved by forming a global noospheric consciousness and the system of a noospheric society, and the collective mind (reason) becomes its basic element.

Epistemological and axiological pessimism regarding global noospheric development can be largely overcome by consulting the works of Vernadsky: “We can see that this is the beginning of a spontaneous movement, a natural phenomenon that cannot be stopped by coincidences in the human history” (Vernadsky, 2004, p. 261). Vernadsky viewed the transition to the noosphere as a necessity. He considered the transformation of the biosphere into a new evolutionary state to be a necessary step. He thought that changing the man of the biosphere to a new man of a new noospheric reality governed by new ethics, ideals, and morality was principal.

The paper was created in the midst of a coronavirus pandemic (COVID-19), which clearly showed the unpreparedness of humanity, oriented towards other goals, to respond to such global challenges. The reminder of Vernadsky's ideas is an opportunity to emphasize the basic attributes of human existence: health, happiness, co-operation and development of moral and spiritual values.

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Conflicts of interest.

The authors declare no conflict of interest.

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Appendix A: Notes

1.	Noosphere	The term noosphere is formed by combining the Greek words noos (reason / mind) and sphaira (sphere). The noosphere, then, is literally the sphere of the mind / reason.
2.	Popper's Third World	According to Popper (2000, p. 72), if we use the word world as a metaphor, we can identify three worlds, of which World “... contains all books, all libraries, all theories, including, of course, erroneous theories and even contradictory theories...” Popper (2002, p. 85) does not consider himself the discoverer of the Third World: “Everyone knows that Plato was the discoverer of the Third World” He means the world of eidos, or the world of ideas and forms.
3.	Russian cosmism	The main intention of Russian cosmism that determines the essence of its civilisational concepts, is the idea of the unity of man and the Cosmos – man is called to bring reason and well-being to nature.
4.	Teilhard de Chardin's concept of noosphere	Teilhard de Chardin draws an imaginary evolution of noosphere: Noosphere of the Earth will be replaced by a super-reason and will result in the so-called Omega point, in which “a large amount of consciousness is accumulated and gathered in its perfection and integrity that is gradually released on the Earth...” (Teilhard de Chardin, 1987, p. 206; Levit, 2000, pp. 166–167). For a detailed

		description of Teilhard de Chardin's concept, see Teilhard de Chardin (1987).
5.	Vernadsky's concepts of biosphere	The term biosphere was coined in the 19 th century by Eduard Suess as “a set of organisms confined to space and time and inhabiting the surface of the Earth” (Oldfield and Shaw, 2013, pp. 291–292)
6.	Bifurcation	The term bifurcation comes from Latin bifurcus, i.e. divided into two branches or parts, and is used in a broader sense to denote all kinds of qualitative transformations or metamorphoses of different objects with changing parameters they depend on.
7.	The concept of global collective reason	For more on the concept of global collective reason, see Moiseev (1999, 2000).
8.	The concept of technosphere	The technosphere concept has been introduced by Haff (2014)
9.	Noospheric humanism	Through the prism of noospheric humanism, one can see the essence and meaning of the spiritual-cosmic evolution of man and humanity.

Галина Ясечкова

Університет імені Коменського, Словаччина

Мілан Конвіт

Університет імені Коменського, Словаччина

Лукаш Вартяк

Університет імені Коменського, Словаччина

Концепція ноосфери Вернадського та її відображення в етичних і моральних цінностях суспільства

***Анотація.** У статті оцінюється актуальність концепції ноосфери Вернадського, яка формувалася протягом майже двадцяти років, починаючи з початку ХХ століття. Наголошуючи на унікальності концепції Вернадського про ноосферу, як перетворення біосфери людиною за допомогою розуму, ми зосереджуємося на оцінці утопічного чи реалістичного характеру його бачення майбутнього людства. На основі аналізу філософських кейс-стаді визначено ідеологічні корені концепції ноосфери, розвиток поглядів на цю концепцію в часі, роль розуму та наукового мислення, думки її прихильників і критиків, а також пов'язану з нею концепцію Моїсеєва. Вказуємо на співвідношення концепції ноосфери Вернадського з роздвоєнням Моїсеєва і двома його імперативами як*

необхідними умовами еволюції природи і людини. Ми підтверджуємо, що Вернадський не лише думав про позитивну роль розуму у створенні та розвитку ноосфери, але й усвідомлював можливість його зловживання. Ми порівнюємо ідею створення колективного розуму Вернадського з концепцією технологічної сингулярності Курцвейла, концепцією антропоцену Крутцена, концепцією техносфери Хаффа та сценарієм Сера про можливий майбутній розвиток у напрямку створення технічних суб'єктів і заміни біосфери техносферою. Ми також оцінюємо можливість наближення основних концептуальних елементів, тобто філософських категорій, колективного розуму, колективного інтелекту людства та наукового знання, сприянню інформаційно-комунікаційним технологіям. Зрештою, сформульовано висновки щодо актуальності концепції ноосфери Вернадського. Ми стверджуємо, що концепція ноосфери Вернадського є позачасовою і її слід сприймати не як утопію, а, навпаки, як сценарій можливого розвитку по лінії геосфера – біосфера – ноосфера, перспективно з перенесенням її в космічний вимір.

Ключові слова: біосфера; ноосфера; еволюція; наукове мислення; етика

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