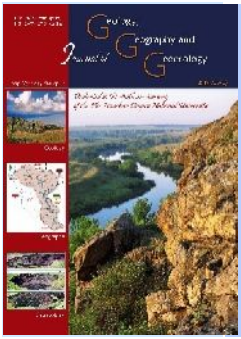

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On the modern conception of environment

[1]S. Sonko, [1]Yu. Kyselov, [2]S. Polovka

[1]*Uman National University of Horticulture, Uman, Ukraine, e-mail: Sp.sonko@gmail.com*
[2]*Uman State Pedagogical University named after Pavlo Tychyna, Uman, Ukraine, e-mail:sergi_polovka@ukr.net*

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Abstract. Currently a large number of, geographers and representatives of related sciences claim to have created integrated environmental concepts . This applies, in particular, to the concepts of "environmental science", "sociogeosystems", "anthropogenic landscape", "eco-geosophia", etc. All of them confirm the importance of solving the global environmental problem, and the need to unite scholars in all specialties. There is a significant revival of interest in the integral essence of geography, especially among anthropogeographers. This testifies to the fundamental unity of geographical science without its distinct division into natural and social geography, which divides the discipline up into a plethora of specific objects and subjects. Anthropogeographers have come to understand that the earth's space was initially organized by Nature itself. Mankind from the Neolithic Age has transformed his use of nature into the noosphere. If before the Neolithic revolution there still existed natural landscapes on the surface of the planet , then the Neolithic populations of *Homo sapiens* started to actively change the environments they inhabited. Approximately then, the search for ways to justify such, often destructive, intervention began. Such a change in the landscape was brought about by man, which encouraged scientists unwittingly to develop an "intentional paradigm", according to which the methodology of each science tries to take into account the role of man not only as a component of nature, but as its researcher. Even Strabo having realized the many-sidedness of human existence on our planet, already in ancient times, considered himself "not a geographer, not a historian, but a philosopher." Hettner, with his idea of "embedding" into the earth's space of all things, considered the object of studying geography this very earthly space with objects and phenomena that filled it and interacted with each other. According to Hettner, the connections between them have a landscape causal nature. To such systems of geobjects, Hettner also related human society. The idea of "through" was found in the works of our contemporary physicist and geographer Aleksey Reteyum, who discovered integral (socio-natural) spatial entities on the surface of the planet ("choriones" and "sphragids"), once again proving the "right to exist" of the noosphere suggested by Volodymyr Vernadsky. At present, it is geographers who must create an adequate concept of the environment, which is not yet developed in completed form. Its final design will require the rejection of the mechanistic perception of the world, divided into objects and subjects of research. It is geographers who should identify in time and space such integrated environmental systems (socio-natural systems, whose subsystems can be natural landscape systems and sociogeosystems), which are shaped as a result of the joint development of nature and society. Prospects for the productive development of environmental science are related to the concept of noosphere ecosystems.

Keywords: environment, noosphere, anthropogenic landscape, intentional paradigm, socio-natural systems.

Про сучасну концепцію довкілля

С. Сонько*, Ю. Кисельов*, С. Половка**

**Уманський національний університет садівництва, Умань, Україна, e-mail: Sp.sonko@gmail.com*
***Уманський державний педагогічний університет імені Павла Тичини, Умань, Україна, e-mail:sergi_polovka@ukr.net*

Анотація. Численні сучасні концепції довкілля часто претендують на інтегральність. Це стосується, зокрема, концепцій «середовищезнавства», «соціогеосистем», «антропогенного ландшафту», «екогеософії» тощо. Знаковим є відродження інтересу до інтегральної сутності географії саме серед антропогеографів, що свідчить про принципову єдність географічної науки. Антропогеографи поступово доходять розуміння того, що земний простір від початку був організований самою Природою. Людство ще з неоліту здійснює на Землі ноосферне природокористування. Якщо до неолітичної революції на денній поверхні планети ще існували природні ландшафти, то з неоліту популяція Homo sapiens починає їх активно змінювати. Приблизно тоді ж почались пошуки способів виправдання такого, часто руйнівного, втручання. Така змінена до непізнаваності людиною ландшафтна оболонка спонукала науковців розробляти «інтенціональну парадигму», за якою методологія

кожної науки намагається врахувати роль людини не лише як складової природи, але як її дослідника. Сьогодні саме географам належить створити адекватну дійсності концепція довкілля, яка в завершеному вигляді поки що не розроблена. Її остаточне оформлення вимагатиме відмови від механістичного сприйняття навколишнього світу, поділеного на об'єкти і предмети дослідження. Саме географам належить позначити в часі й у просторі такі інтегративні системи навколишнього середовища (соціоприродні системи, підсистемами яких можуть бути природні ландшафтні системи у різному ступені змінені людиною), які утворені в результаті спільного розвитку природи і суспільства. Перспективи продуктивного розвитку науки про довкілля (довкіллєзнавства) пов'язані з концепцією ноосферних екосистем.

Ключові слова: довкілля, ноосфера, антропогенний ландшафт, інтенціональна парадигма, соціоприродні системи.

Introduction. The article is the continuation of the discussion about the concept of the environment, which once again (after V. Nikolayev (Nikolayev, 2006), V. Nekos (Nekos, Nekos, Safranov, 2011), M. Holubets (Holubets, 2015), O. Kovalyov (Kovalyov, 2014), H. Denysyk (Denysyk, 2001) and others) was carried on in the article by O. Topchiev, D. Malchykova, I. Pylypenko and V. Yavorska (Topchiev, Malchykova, Pylypenko, Yavorska, 2017).

The very fact that the article was published in 'Ukrainian Geographic Journal' in the section 'Call for Discussion', testifies to the extraordinary urgency of this problem. It is noteworthy that this section in UGJ reminds one of an old trap, which the editorial board regularly walks into, however, it always appears on its way. Indeed, there have been more than 10-15 articles dealing with the problem in this section since the mid-1990s (V. Pashchenko, I. Chervaniov, O. Kovalyov, O. Topchiev, M. Holubets, L. Rudenko, M. Bagrov, S. Sonko, etc.). In spite of the fact that the national geographic establishment openly neglects methodological problems of geography, it (the methodology) nevertheless makes its way up above the ground, like shoots that lean towards the sun. This is confirmed by all attempts to develop a single concept of the environment. Such attempts testify to the fact that this problem can gradually move most other problems in the subject area of many sciences to the background. The processes associated with this were noticed by V. Vernadsky[1] and emphasized by one of the authors in the early 2000s (Sonko, 2003).

The fact that the authors of the above-mentioned article are anthropogeographers (representatives of economic, or, broadly speaking, social geography) is really significant. Perhaps the revival of in-terest in the integral essence of geography among anthropogeographers marks the transition of this science to a qualitatively new (old?[2]) level of interpretation of reality. This is obvious to a great extent, since the monographic study of both the centre and periphery relations (Pylypenko, 2015) and the basics of geo-planning (Topchiev, 2014) once would certainly have led the authors to understanding the integral properties of the Earth's space — without dividing it into 'the objects the study' of natural geographers and anthropogeographers — geospheres (Topchiev, Malchykova, Pylypenko, Yavorska, 2017), and without its vague attribution to 'the subject area' of either social or natural geography (Topchiev, 2004). The present-day fragmentation of geography, which used to be integral, is sometimes absurd. One may visit the site of 'Bibliometrics of Ukrainian Science'. In the section 'Earth Sciences' only the scientific preferences of physiographers (mainly geography and cartography, or the environment) (T. Bobra, M. Hrodzynskyi, H. Denysyk, I. Kovalchuk, etc.) are more or less adequately given an account of. As for economic geographers, perhaps only O. Topchiev appeared in the section 'Geography and Cartography' in the branch called 'Social Sciences". The rest of the representatives of this modern geography branch are at best marked as 'Geography and Cartography'. Most scientists are referred to the purely natural 'Earth Sciences', 'Environmental Sciences' and 'Ecology'. As a result, it gives an impression of the inappropriateness of 'discrimination' of both social and public geography.

We are convinced that it is anthropogeographers who have to be most concerned about the problem of the integral nature of the Earth's space.

'Nowadays, the framework of individual sciences, which scientific knowledge is streamed into cannot accurately determine the area of the scientific idea of a researcher and exactly describe his scientific effort. The problems that are of interest to him often do not fit into the framework of an individual, well-formed science. We specialize not in sciences but in problems' (Vernadsky, 1991).

[2] Did not the classic of economic geography N. Baransky in the 30s of the twentieth century urge that a territory (of a country or a region, etc.) be considered as a complex 'from geology to ideology'? Was not it our compatriot Serhiy Podolynskyi in the 19th century who emphasized the energetic essence of all economic processes, thus trying to implement truly objective (physical and economic) pricing mechanisms for goods and services in the world economic system? Taking into account the fact that it is economics and economic sciences that are the leaders in a complex system of developing natural resources of the planet (including its landscape envelope), it may be more appropriate to call oneself an economic geographer, rather than a social geographer or public geographer.

Eventually, these scientists will realize that the Earth's space from the very beginning was appropriately or-ganized by Nature itself. Various terms have been suggested for the interpretation of the Earth's space itself and its individual fragments, as well as for the science that would conduct its integrated study. In particular, various aspects of existence of the Earth's space today are explored in the context of the concepts of sociogeosystems (Nemets, Nemets, 2014), environmental studies (Holubets, 2015), neoecology (Nekos, Nekos, Safranov, 2011), anthropogenic landscape (Denysyk, 2001), intentional paradigm (Topchiev, Nudelman, Rudenko, 2012), ecogeosophy (Kyselov, 2015), etc.

In fact, the recent intensive growth of the debate on environmental studies also has another root – the civilizational one. There is an inevitable question that geographers of the anthropogenic and landscape branch (Yablokov, Levchenko, 2015) face today, in the era of radical man-made changes in the biosphere, — is it still safe to further 'scientifically justify' the change of natural landscapes by man? Is this safe as long as such 'scientific justification' gives a powerful tool to 'constructors' of the 'mining', 'uranium' and other landscapes for further human attacks on nature (Sonko, Maksymenko, 2016).

Material and methods of research. The research is based on the elucidation of the main provisions of the existing concepts of environmental studies that have features of integrity with respect to the natural sciences, the theoretical foundations of which lie in their basis.

In the course of the research, mostly philosophical and general scientific methods were used, including the logical ones (analysis, synthesis, comparison, deduction, induction), as well as dialectics.

The analysis was implemented at each stage of the research. When considering different concepts, their objects were determined and the content characterized, geographical and ecological components were compared. Synthesis, which is the dialectical opposite of analysis and is logically applied after the latter, consists in highlighting the common features of different environmental concepts that can form the basis of the integrated environmental study concept. Comparison of the analysed scientific constructions is an indispensable tool for extracting their common or similar elements.

The study used the deductive and inductive methods. In particular, the deduction manifests itself in taking the idea of creating an integrated environmental study concept as a starting point, and each item of individual natural science concepts was characterized in terms of its conformity with the general purpose of our research. The induction reveals itself in the selection of such provisions of each scientific construction, which can become 'building material' for the creation of an integrated concept of the environment.

Dialectics as a philosophical method is present in the research due to the application of the laws of unity and struggle of opposites (through a combi-nation of analysis and synthesis, deduction and induction), and the transition of quantitative changes to qualitative ones (due to the gradual accumulation of individual concepts in natural science, which, taken together, give the necessary facts and scientific provisions for the construction of an integrated concept of the geographic and environmental study).

The research made use of the historical method, in particular, when analysing the development of environmental ideas in time (from the noosphere by V. Vernadsky up to environmental studies by M. Holubets).

Results and their analysis. Taking into account the unsuccessful attempts of non-geographers to solve a purely geographical problem (the concept of 'environmental studies' by M. Holubets), one of the authors, considering himself to be an economic geographer (not even a social or a public geographer), solved this problem for himself 15 years ago (Sonko, 2003).

In fact, humanity has for a long time (approximately from the Neolithic period) exercised nature management of the noosphere on our planet. But if, before the Neolithic revolution, there had been natural landscapes on its daylight surface, after it *Homo sapiens* started to actively modify them, 'building himself' into the landscape envelope and forming anthropogenic landscape strips such as a 'forest field' (Denysyk, 2001) with ecotones — without explicit boundaries of natural zones. Approximately at that time, the search for the ways to justify such intervention, which was often destructive, began. Thus, in recent years, the landscape envelope, unrecognizably changed by man, has prompted scientists to develop an 'intentional paradigm', according to which the methodology of each science tries to take into account the role of man not only as a component of nature, but as a researcher who creates different branches of knowledge and sets respective subjective target guides for them (Topchiev, Nudelman, Rudenko, 2012). In our opinion, this is an obvious step back, as this emphasizes the return to the object-object relations between man and nature, which most modern landscape scientists (M. D. Hrodzynsky) rejected long ago in favour of the post-classical subject-subject ones (Maksymenko, 2018).

Therefore, the idea of the noosphere (almost two thousand years before the term appeared) 'embedded' in the Earth's atmosphere, has embarrassed geographers from the times this science appeared. Thus Strabo, the author of the world-famous 'Geography', understanding the many-sidedness of human existence on our planet, even in ancient times, considered himself to be 'not a geographer, not a histo-rian, but a philosopher' (Arsky, 2015). A. Hettner, with his idea of 'embedding' all things in existence into the Earth's space, considered this very earthly space with all the objects and phenomena present in it and interacting with each other to be the object of geographical studies. The links among them, according to A. Hettner, have a landscape, causal nature. A. Hettner also referred human society to similar systems of geo-objects. Some unique combinations of certain objects and phenomena in a particular territory lead to the emergence of geographic countries (choros, space) (Hettner, 1927).

However, the idea of 'transversality' was fully elucidated in the book by our contemporary O. Reteyum 'The Earth's Worlds'. He 'discovered' integrative (socio-natural) spatial entities ('chorions' and 'sphragis') on the daylight surface of the planet (the term by O. Kovalyov) and once again proved the right of the noosphere as defined by V. Vernadsky to exist. At the same time, being a physical geographer, O. Reteyum was constantly reinforcing this idea by examples of consortium relations in 'pure' (without humans) nature (Reteyum, 1988).

Dozens (or even hundreds) of scientists (not only geographers) can be listed as those who have come up with an idea of the integrity of the planetary structure (J. Lovelock, L. Margulis, V. Gorshkov, etc.). This idea turned out to be so obvious that even well-known movie makers (James Cameron, 'Avatar') succeeded in promoting it. Nevertheless, its real implementation into life, which gave rise to the 'strategy of sustainable development', in its twenties (Johannesburg, 2002) became deficient, which has been written about many times (Sonko, 2018).

The comprehension of the reclaimed Earth's space substantially transformed by the versatile activity of humans (at different levels — from the planetary up to the local level) is also carried out by ecogeosophy. The sources of ecogeosophy, which was founded at the end of the twentieth century, are 'classical' geosophy and modern ecology.

We used the epithet 'classical' in inverted comas with respect to geosophy, because even the age of this discipline — not only ecogeosophy — is less than a century. Geosophy is a philosophy of human space that explores spiritual aspects of the natural landscape's influence (conditionally, unchanged by man) on human communities, in particular ethnos. L. Gumilev considered ethnos to be a geographical, landscape phenomenon, and the landscape itself — its storage and nutritional medium (Gumilev, 2006). Consequently, geosophy is a science of landscape and ethnic interaction.

The synthesis of geosophy with modern ecology, which long ago evolved out of the former position of a branch of biology, becoming an independent science and, moreover, an extensive system of many bio-, geo-, socio- and technical ecological disciplines, is ecogeoseophy. If the scheme of geosophical regionalization of the Earth's space (Earthworld), based on the nature of landscape-ethnic interaction (Kyselov, 2011) became the logical result of our geosophical research, then the peculiarities of human space caused by more or less significant changes in landscapes as a result of economic and other types of human activities should be taken into account when conducting ecogeosophic research. In particular, in terms of ecogeosophy, the Donbas appears to be not only and not so much in the Donets Territory, a fragment of the steppe landscape and an extrazonal island of the forest steppe in the steppe for the territory of Ukraine, and, above all, a region with a predominance of 'anthropogenic' (according to the terminology of one of the authors (Kyselov, 2017) landscapes proper. Thus, this region seems to be taken out of human space, becoming a virtually unfit environment for the life of the landscape predetermined human communities - ethnoses. The example of the Donbas illustrates the discrepancy of ecogeophysical realia, which we will later depict in the form of sketch maps as already mapped geosophical earth-spatial formations.

The post-classical approach to the formation of the ecological network can be the confirmation of the anthropogenic component of landscape development (especially for the regions of old industrial development). According to this approach, not only natural objects but also the man-made ones must be bequeathed today, (Sonko, Kazakova, 2016).

We present the analysis of the abovementioned modern environmental concepts, which more or less claim to be integral, in Table 1.

In our opinion, the main feature of all the environmental concepts analysed is their interdisciplinary nature. Mostly the tendencies for integration between geography and ecology (in particular, geosociosystemology, environmental studies, anthropogenic landscape studies, neoecology), as well as between ecology and noosphereology (in the concept of noosphere ecosystems), among geogra-

phy, ecology and philosophy (with respect to eco-geosophy) can be traced.

Table 1. A Comparative Characteristicof Modern Environmental Concepts

Authors of the Concepts	Names of the Concepts	The Main Content
M. Holubets	The concept of geosociosystems, environmental studies	The need for the integration of natural sciences around the topical environmental problems, the consideration of man outside the biosphere (which is an environment for humans), the cross-cutting nature of the sciences studying the interaction of man and the biosphere at the theoretical level (geosociosystemology) and the applied one (environmental studies)
G. Denysyk	Anthropogenic landscape studies	The virtual absence of natural landscapes within the developed land of the Earth today, the acquisition of qualitatively new content by the landscapes in connection due to their anthropogenic transformation, the need for their study as anthropogenic geospatial systems
V. Nekos, A. Nekos	Neoecology	Non-traditional approach to ecology from the point of view of the leading influence of human transformational activity on ecosystems
K. Nemets, L. Nemets	The concept of sociogeosystems	Anthropocentric idea of sociogeosystems as geospatial social formations of different ranks
O. Topchiev	The concept of spatial organization of nature, population and economy, intentional paradigm	Consideration of man as a component of nature and at the same time a researcher who through his cognitive activity sets subjective target guides for it
S. Sonko	The concept of noosphere ecosystem	Consideration of '*Homo sapiens'* as an equal to others in carrying out his material-energy exchange in the biosphere
Yu. Kyselov	Ecogeosophy	Consideration of geospatial structures of the Earth's world with the account of not only the landscape-ethnic interaction in the natural environment, but also the type of nature management and the human-induced transformation of landscapes caused by it; geosophy of the explored space

Consequently, the focus of contemporary environmental studies and the greatest point of growth of the integrated concept of the environment lies at the intersection of geography and ecology. It should be emphasized that we mean unified geography without its traditional division into physical and socio-economic geography, since virtually all branches of modern geography have ecological content: physical (natural) geography studies the natural landscapes that served as the initial material for man in his diverse economic activity; constructive geography develops probable ways of formation of natural and anthropogenic geosystems in ecological equilibrium on the basis of anthropogenically transformed landscapes; socio-economic (public) geography is related to ecology through the doctrine of natural resources and territorial organization of economy. After all, most branches of economic activity have a greater or lesser negative impact on the environment: enterprises and heavy industry, especially mining, as well as motor transport, pollute the air and water environment; agricultural production neglecting environmental requirements and criteria, causes anthropogenic acceleration of erosion processes (both sheet wash and linear erosion) and soil contamination due to excessive application of mineral fertilizers and pesticides.

It is worth noting that some of the aboveconcepts have general geographic content (in particular, anthropogenic landscape studies, neoecology, the concept of noospheric ecosystems, ecogeosophy), which gives grounds for considering complex objects that are investigated with their application as integral systems of various geospatial ranks. At the same time, the concept of sociogeosystems has purely sociogeographical content, which also makes objects that are studied within the framework of this concept (sociogeosystems of various spatial ranks) subsystems of integral systems (such as noosphere ecosystems).

After the analysis of the undoubtedly important concepts of environmental studies, the main question of nature management — 'Why does the global environmental problem continue to get worse?' — still remains unanswered. Even recent fundamental treatises on this problem (Yablokov, Levchenko, 2015, 2016, 2017) do not give any

hope for a constructive solution to it. Thus, the authors give an answer to the question 'What is going on?' in the first article of the series (Yablokov, Levchenko, 2015). The second article gives an unambiguous answer to the question 'Who is to be blamed?' There is no doubt, it is man (Yablokov, Levchenko, 2016). However, the third article of the cycle gives no answer to the question 'What is to be done?' The authors state that 'the contemporary discourse of social evolution, in spite of attempts to unite the enormous amount of facts and ideas in the field of development of human society, is still at the stage of substantiating hypotheses and distinguishing tendencies. All these efforts have not led to the creation of any comprehensive concept yet, not to mention a complete theory' (Yablokov, Levchenko, 2017).

We dare assert that such a concept (the concept of noosphere ecosystems) was developed by one of the authors 15 years ago (Sonko, 2003).

The essence of the concept of noosphere ecosystems is as follows (Sonko, 2010):

1. The main reason for the emergence and aggravation of the global environmental problem is the different development rates of nature and society. The search for and finding the specific Man ecotope and the study of its spatial evolution is a result of spatially and temporally different, or 'separated' in time and in space, states of nature and society. In order to constructively solve 'the global environmental problem', one must radically revise, first of all, the spatial existence of a man as a species , *Homo sapiens*. With this aim, one must find such areas of the Earth's space, in which the gap in the speeds of nature and society is 'captured', and in future bring them into the necessary correlation.

2. The aspiration for the state of the noosphere (at the present stage — 'sustainable development') with the course of the process of noospherogenesis should be carried out by Man within the spatial boundaries of the social-natural systems, which substantially represent ecosystems and have a double character of the boundaries. That is, these are such synergistic interconnections of natural and social components that are already evolving according to their own laws. Approximation of the territorial organization of society to the noosphere is proposed to be implemented in the form of possible scenarios at different spatial levels (Table 2). The existing strategy for creating an ecosystem should cover the meso- and macro levels. At the micro level, it is also necessary to implement a strategy of combining the boundaries of natural and agroecosystems, coordinated with the noosphere dynamics. Thus, we comply with one of the main conditions of the noosphere development — such a change in the structure and functions of natural ecosystems performed by man keeps them capable of self-reproduction.

3. One of the main noosphere provisions of theecology of *Homo sapiens* is that this species is an equal participant in the natural matter-energy cycle. But he has expanded the boundaries of his ecological niche due to the advanced timing of natural processes ('time traps', for example, prolonged storage of biomass in refrigerators, canning, etc., instead of their decomposing by reductions immediately after dying), spatial transformation of its ecotope ('space traps', for example, in the form of 'properly' organized crop rotation, contouring-reclamation systems of agriculture, etc.). Moreover, such a spatial-temporal transformation has considerably increased the level of the planetary entropy ('information traps' (Sonko, 2003a; 2003b; 2003c; 2003d).

4. *Homo sapiens,* in the process of his life in the biosphere of theEarth, forms spatial/edaphic systems which are ecologically identical with other types, and similarly participates in the food chains, occupying his trophic level in the ecosystems that are radically rebuilt in terms of space, but are, nevertheless, natural. 'Ecotope' of man goes beyond the limits of the organism level of organization of a species and occupies the population and even the ecosystem level. Therefore, it is more logical to talk about an agroecosystem as a modified ecological niche of *Homo sapiens* with unclearly defined (moving) spatial boundaries. Therefore, there is no reason to consider the agroecosystem (as well as other noosphere ecosystems) of *Homo sapiens* as unnatural (variants: 'semi-natural', 'combined', 'artificial', 'anthropogenic', 'technogenic'), based on the presence of 'the second nature', Man. All ecosystems, including anthropoecosystems (or the noospheric ones), are 'primordial'.

5. The uncertainty of the main guidelines of the concept of sustainable development, which in its present manifestation implies the unfair division of the global territory by 'civilized' countries according to ecological functions (Pozdnyakov, Tikunov, Fedotov, 2003; Protopopov, 2003), induces one to seek one's own concept of the noosphere development, based on the necessity of the methodological separation of the idea of reaching the noosphere state by socio-natural systems (sustainable development) and the idea of nature conservation (with the preservation of an anthropocentric attitude towards it). With the aim of approaching sustainable development, the priority development of agroecosystems, as ana-logues of the noosphere ecological niche of *Homo Sapiens* is viewed. There is a subsequent need to 'insert' the administrative-territorial division into the agroecosystem's bor-

ders, because in this case the chorological content of the interaction of nature and society will approach the optimal ones (Sonko, 2010). In order to implement the concept practically, a model of socio-natural interaction was developed. It is based on the principle of spatial rotation of the functions of urban and agroecosystems with the tendency towards not a barrier, but a contact (ecotonic) type of boundaries between natural and anthropic elements. At the same time, the pattern of the interaction between nature and society radically changes from the anthropocentric to the adapted one. Given the main content of the above concept, we must agree with the opinion of K. Losev and V. Gorshkov (Gorshkov, 1995; Losev, 2003) that the main guarantee of 'the noosphere' character of nature management should not be quotas for carbon dioxide emissions (Kyoto Protocol), but the successful support of self-reproduction mechanisms of natural ecosystems in certain countries.

Concerning agroecosystems, according to current estimates, the emission of carbon (as the main contributor to the greenhouse effect) from the world's agriculture exceeds its emissions from the combustion of fossil fuels by 10% (Losev, 2003). Therefore, modern agriculture is the main contributor to the greenhouse effect, and this impact will continue to grow in the context of the economic and demographic crisis. The practical solution to these contradictions is the rebirth of such communities of people in the countryside, which by the type of their spatial existence would be close to natural ecosystems. Radical changes in the spatial existence of humankind towards the natural economy will help stabilize the population growth, and will make nature management adapted to natural ecosystems (Sonko, 2017).

Noosphericism — is the doctrine of human society based on the noospheric principles, which consist in the comprehensive adaptation of nature management to natural mechanisms (Table 2). There are objective prerequisites for this. Thus, in rural areas of most countries, people are forced to the brink of survival, which urges them to return to the natural economy and the need to harmonize with the natural landscapes in which the family lives. There are new public initiatives of 'returning to nature' such as the ecological movement 'Ringing Cedars of Russia', manufacture of organic products, ecological settlements, etc. The consumption of natural substances and energy and the generation of biowaste are based on ecosystem principles. The consumption of the ecological resource of the planet 'is stretched' in time in order to ensure the proper conditions for future generations' life.

The spatial, ecological and social life of Man becomes a form of combination of local age-long traditions of nature management and the latest technology in which there are no entropy limitations. The result is a gradual return of the energy consumption of the human population to a level of 1%, which is in accordance with the laws of the ecosystem organization of living organism populations. The main ideas of the noosphere, adapted to the balanced nature management, correlate with the above concept of noosphere ecosystems.

Conclusions

- Activation of the problem of the environmental concept by anthropogeographers testifies to the fundamental integrity of the entire geographic science without its distinct division into natural and social (or physical and economic) geography previously dogmatically proclaimed by the Soviet methodology and ideology.
- A contemporary, adequate concept of the environment has not been developed yet. Its development and final design will require, above all, the rejection of the mechanistic perception of the surrounding world divided into objects and subjects of research.
- Within the framework of the main problem (the global environmental problem) of the article, it is geographers who must indicate in time and space such integrated environmental systems (socio-natural systems, the subsystems of which can be presented by natural landscape systems to varying degrees changed byman) that are formed as a result of the joint development of nature and society.

Table 2. Scenarios of Transition to Sustainable Development

Scenario Elements	Scenarios and Concepts of Nature Management			
	Conservative	Centristic	Scientific	Noospheric
The range of the planet's population (billion people)	0.5—1.5	8—12	30—50	8—10
The nature of urbanization	The level of urbanization decreases, econetworks develop instead of metropolises and big cities	Gradual stabilization of the number and size of cities, as well as the population of the Earth	The level of urbanization increases, big cities ecologize, including metropolises	The level of urbanization decreases, cities are preserved, but stop playing the role of 'a social creature', the net of ecosettlement expands
The change in the	Decrease by 6—10	Increase by 2—3 times	Decrease by 10 and	Gets stabilized at the ex-

volume of the world's power consumption	times		more times	isting level, but the structure of power consumption changes radically towards energy-saving
The structure of energetics	RE-based energy (Renewable Energy)	Polyenergetics: atomic, based on RE, thermal	The predominance of nuclear power	Basic — hybrid and alternative; supporting — atomic.
The nature of agriculture:	Economical	Moderately economical	Over-intensive	Economical and natural
- the share of arable land	Low (35-40%)	Moderate (up to 50%)	High (over 60%)	Low (35-40%)
- the system of agriculture	Organic. Mineral fertilizers and pesticides are not used.	Compromise. Mineral fertilizers and herbicides are used in moderate doses.	Intensive. Closed soil, high doses of mineral fertilizers, irrigation, monoculture are widely used.	Highly adaptive to local conditions, with a minimum number of energy subsidies.
- the variety of farm animals and the type of feeding	High variability, extensive feeding relying on natural forage grounds, growth stimulants are not used.	Moderate diversity, integrated feed rations with the use of forage from arable land, growth stimulants are not used.	Low diversity, intensive breeding of cattle, pigs, poultry with arable food, wide use of growth stimulants and other 'biochemistry'	Diversity according to local traditions, integrated feeding, adapted to local conditions (provided that the share of 'fodder arable land' is not more than 15%).
- transgenic varieties and breeds	Not used	Used in moderation	Widely used	Transgenic and introduced plants are either excluded completely or do not significantly affect the structure of cultural phyto- and zoocenosis.
- the peculiarities of agricultural products' consumption	Mostly no animal protein consumption in favour of the vegetable one	The diet is close to the current one	The diet is 'distorted' towards the further increase in the consumption of animal protein	The diet is balanced and meets local traditions
The main structural materials (and mineral resources)	Secondary	Primary and secondary with the development of resource-saving technologies	Replacement of finite resources with their new equivalents	Replacement of finite /exhaustable resources with their new equivalents that will be capable of biodegradation upon completion of use
Environmental pollution	Minimal due to the closure of all environmentally unfriendly industries and the implementation of non-waste technologies	At the current level	Moderate due to low-waste technologies, improved treatment facilities and disposal of especially hazardous waste	Minimal due to deurbanization, transition to new construction materials, reduction of the general level of consumption and introduction of a significant share (up to 40% of GDP) of the natural economy.
Biodiversity protection	Complete preservation	Preservation of a larger part	Preservation of 50-70%	Gradual withdrawal from agroecosystems in their present form in favour of adapted forms of nature management
The share of protected natural territories on the planet	70%	33%	Less than 10%	The need for the introduction of protected areas is gradually disappearing

The prospects for the productive development of environmental science are related to the concept of noosphere ecosystems, which has been developed by one of the authors over the past 25 years (Sonko, 1992-2018) and can become anintegral part of the content of ecogeosophy, the theoretical and methodological principles of which have been improved in treatises of another author (Kyselov, 2015).

References

ArskyF. N., 2015. Yesli by ne bylo Strabona [IfStrabodidn't exist]. / http://booksonline.com.ua/view.php?book=87675 . (In Russian).

Denysyk H. I., 2001. Lisopole Ukrayiny : Monohrafiya [The "forest-and-field" of Ukraine: A monograph]. Tezys, Vinnytsya. 264 p. (In Ukrainian).

Gorshkov V. G., 1995. Fizicheskiye i biologicheskiye osnovy ustoychivosti zhizni [Physical and biological fundamentals of the sustainable life]. VINITI, Moscow. 470 p. (In Russian).

Gumilev L. N., 2006. Etnogenez i biosfera Zemli [Ethnogenesis and the Earth's biosphere]. – Airis-Press, Moscow. 558 p. (In Russian).

Hettner A., 1927. Die Geographie, ihre Geschichte, ihr Wesen und ihre Methoden [Geography, its history, being and methods]. – Ferdinand Hirt, Breslau. 463 S. (In German).

Holubets M. A., 2015. Seredovyshcheznavstvo – v heohrafichnu nauku [Environmental studies – to the geographical science]. Ukrainian Geographical Journal. – #2. 10–15. (In Ukrainian).

KovalyovO. P., 2014.Zahalnaheohrafiya: yakoyuyerealnist, yaku, yakvvazhayutheohrafy, vonydoslidzhuyut? [General geography: whatistherealitythat, asthegeographers consider, they research?] /http://www.geography.pp.ua/2014/12/blog-post_8.html#more. (In Ukrainian).

Kyselov Iu. O., 2011. Osnovy heosofiyi: problemy teoriyi ta metodolohiyi [Fundamentals of geosophy: issues of the theory and methodology]. SF "Luhansk Taras Shevchenko National University", Luhansk. 208 p. (In Ukrainian).

KyselovIu. O., 2015. Doformuvannyanaukovykhzasadekolohichnoyiheosofiyi [Onshapingscientificfundamentalsofecologicalgeosophy] Heraldofthe-ChernivtsiYuriyFedkovychNationalUniversity. Ser. Geogr. – #762–763. 28–33.(In Ukrainian).

Kyselov Iu. O., 2017. Deyaki terminolohichni aspekty problemy antropohennoho peretvorennya landshaftu [Some terminological aspects of the issue of the anthropogenic transformation of landscape]. Ecology – ways of harmonization of the relations between nature and society. Uman. 12-14. (In Ukrainian).

Losev K. S., 2003. Byudzhet antropogennogo ugleroda i rol ekosistem v yego emissii i stoke v globalnom i kontinentalnom masshtabe [The budget of anthropogenic carbon and the role of ecosystems in its emission and flow in the global and continental scales]. Countries and regions on the way to sustainable development. Akademperiodika, Kyiv. 36-41. (In Russian).

Nekos V. Yu., Nekos A. N., Safranov T. A., 2011. Zahalna ekolohiya ta neoekolohiya: pidruchnyk dlya studentiv ekolohichnykh spetsialnostey vyshchykh navchalnykh zakladiv [General ecology and neoecology: a textbook for the students of ecological specialties in higher educational institutions]. Kharkiv Vasyl Karazin National University, Kharkiv. 596 p. (In Ukrainian).

Nyemets K. A., NyemetsL. M., 2014.Teoriya I metodolohiya heohrafichnoy inauky: metod yprostorovohoanalizu [Theory and methodology of the geographical science: methods of spatial analysis]. Kharkiv Vasyl Karazin National University, Kharkiv.172 c.(In Ukrainian).

NikolayevV. A., 2006.Garmonicheskiye kanony prirody [The harmonic can on softhenature]. Herald of the Moscow University. Ser. 5. Geography. – #4. – 8–14. (In Russian).

Pozdnyakov D. V., TikunovV. S., Fedotov A. P., 2003.Razrabotka I kartografirovaniye integralnykh pokazateley ustoychivogo razvitiya stranmira [Creating and cartographingintegralindexes of sustainable development of the countries of the world]. Herald of the Moscow University. Ser. 5. Geography. #2. 20–29. (In Russian).

Protopopov P., 2014. Biokorellirovannaya paradigma razvitiya (elektronnyi resurs) [The bio-correlated paradigm of development (An electronic resource)] http://images. yandex.com/yandsearch ource=wiz&fp=0&text=ПаисийПротопопов (In Russian).

Pylypenko I. O., 2015.Suspilno-heohrafichna peryferiya: kontseptsiya, parametry zatsiyaidelimitatsiya : Monohrafiya [Socialandgeographicalperiphery: aconception, parameterization and delimitation : A monograph]. Hrin DS, Kherson. (In Ukrainian).

Reteyum A. Yu., 1988. Zemnyye miry [Earth realms]. Mysl, Moscow. 272 p.http://geoman.ru/books/item/f00/s00/z0000078/index.shtml. (In Russian).

Sonko S. P., 2018. Spysok naukovykh i naukovometodychnykh prats profesora Sonka S. P. stanom na 1.01.17. Pozytsiyi: 29, 31, 45, 46, 47, 48, 49, 51, 52, 54, 57, 58, 61, 63, 65, 68, 70, 71, 73, 74, 78, 86, 90, 93, 94, 97, 103, 124, 125, 134, 141, 142, 164, 178, 187 [The list of scientific and scientific and methodical works by Professor S. P. Sonko as of 1.01.17. Positions: 29, 31, 45, 46, 47, 48, 49, 51, 52, 54, 57, 58, 61, 63, 65, 68, 70, 71, 73, 74, 78, 86, 90, 93, 94, 97, 103, 124, 125, 134, 141, 142, 164, 178, 187] /http://lib.udau.edu.ua/handle/123456789/5320. (InUkrainian).

Sonko S. P., 2003.Prostorovyi rozvytok sotsiopryrodnykh system: shlyakh donovoy I paradyhmy: Monohrafiya [Spatial development of the social and natural systems: the way to anew paradigm: A monograph]. Nika-Tsentr, Kyiv. 287 p. / http://lib.udau.edu.ua/handle/123456789/367.(In Ukrainian).

Sonko S. P., 2003.Heohrafichna interpretatsiya dopovidey Rymskomuklubu [A geographical interpretation of the reports to the Club of Rome]. Ukrainian Geographical Journal. № 1. 55–62. (In Ukrainian).

Sonko S. P., 2003.Prostorovi doslidzhennya infrastruktury velykohomista dlya rozrobky kontseptsiyiinfraeko system (na prykladi Kryvoho Rohu) [Spatial researches on the infrastructure of agreatcity for creating a conception of infraecosystems (on

the example of Kryvyi Rih)].Economic and Social Geography. #54. 188–197. (In Ukrainian).

Sonko S. P., 2003. Regionalizatsiya, prykordonni konflikty ta maybutni shlyakhy rozvytku pryrody i suspilstva [Regionalization, boundary conflicts and future ways of development of nature and society]. Countries and regions on the way to sustainable development. (In Ukrainian).

Sonko S. P., 2010. Kontseptsiya noosfernykh ekosystemya k prodovzhennya idey V. I. Vernadskoho [The conception of noospheric ecosystems as continuation of V. I. Vernadsky'sideas]. Noosphere and civilization. All-Ukrainian Philosophical Journal. #8-9 (11). 230-241. (In Ukrainian).

Sonko S. P., 2011.Heohrafichna nauka v novykh sotsialno-ekonomichnykh umovakh rozvytku Ukrayiny [The geographical science in new social and economic conditions of development of Ukraine]. Constructivism in the modern geography. Ukrainian Geographical Journal. #1. 32–33. / http://lib.udau.edu.ua/handle/123456789/388. (InUkrainian).

Sonko S. P., MaksymenkoN. V., 2013. Prostorovi i chasovi mekhanizmy ekolohichnoyi ekspansiyi agrolandshaftu [Space and time mechanisms of the ecological expansion of agrarian landscape]. Human and environment. #2(15). Kharkiv : Kharkiv Vasyl Karazin National University. 5–21. / http://lib.udau.edu.ua/handle/123456789/351. (In Ukrainian).

Sonko S. P., Kyselov Iu. O., 2014.Landshaftno-etnichna vzayemodiya yak metodolohichna problema ekolohiyi [Landscape and ethnical cooperation as a methodological issue of ecology]. Ecology – ways of harmonization of relations between nature and society. Uman : Uman National University of Horticulture. 9–13. / http://lib.udau.edu.ua/handle/123456789/536. (In Ukrainian).

Sonko S. P., Maksymenko N. V., Kyselov Iu. O., Mezentsev K. V., 2015. Ekolohichni osnovy udoskonalennya administratyvno-terytorialnoho ustroyu Ukrayiny [Ecological fundamentals of optimization of the administrative and territorial order of Ukraine]. Uman : Uman National University of Horticulture. http://lib.udau.edu.ua/handle/123456789/6195. (InUkrainian).

Sonko S. P., 2015.QUO VADIS, vitchyznyanasuspilnaheohrafiya? [QUO VADIS,native human geography?]. Up-to-date issues of development of the geographical science and education in Ukraine Kyiv : Obriyi. 51–53. http://lib.udau.edu.ua/handle/123456789/901. (In Ukrainian).

Sonko S. P., MaksymenkoN. V.. 2016. Pro "pryrodnist" ta "antropohennist" landshaftotvorennya [Aboutthe "naturality" andthe "anthropogenity" oflandscapeshaping]. Human and environment. Issues of neoecology. Modern geographical and ecological researches of environment. #1–2(25). Kharkiv : Kharkiv Vasyl Karazin National University. 9–13. http://lib.udau.edu.ua/handle/123456789/2783. (In Ukrainian).

Sonko S. P., Yamchuk P. M., Kyselov Iu. O., Sukhanova I. P., 2016. Vzayemozvyazok rozvytku agrarnoyi haluzi i metodolohiyi agrarnoyi nauky v umovakh postindustrialnoyi ekonomiky (u konteksti perekhodu na novi standarty vyshchoyi osvity) [Interconnection of development of the agrarian branch and the methodology of the agrarian science in the conditions of post-industrial economy (in the context of passage to the new standards of higher education)].Social and economic aspects of sustainable development of the Ukrainian economy: A collective monograph. Uman : Sochynsky M. M. 122–134. http://lib.udau.edu.ua/handle/123456789/2639. (InUkrainian).

Sergiy Sonko, 2016. The concept of spatial redistribution in modern subject field of social geography.JournalofSocialandEconomicGeography. #21 (2). Kharkiv : KharkivVasylKarazinNationalUniversity.12–18.

Sonko S. P., KazakovaT. A., 2016. Chytrebazapovidaty antropohennil and shafty (postneklasychnyi pohlyad na sklad natsionalnoyi ekolohichnoyi merezhi) [Is it necessary to reserve anthropogenic landscapes (a post-non-classical view on the structure of the national ecological network]. Perspectives of the development of forestry and landscape gardening. Uman : Vizavi. 18-20. (In Ukrainian).

Sonko S. P., 2017. Biosferotsentryzm u suchasnykh kontseptsiyakh vzayemodiyi pryrody i suspilstva [Biospherocentrism in the modern conceptions of collaboration between nature and society]. An ecological strategy of the future. Umanhttp://lib.udau.edu.ua/handle/123456789/6164 (In Ukrainian).

Sonko S. P., 2018. Stalyi rozvytok: 25 rokiv nadiy ta rozcharuvan [Sustainable development: 25 years of hope and disappointment]. Sustainable development– state and perspectives. Lviv : Lviv Polytechnics publishers. 59–63. http://lib.udau.edu.ua/handle/123456789/6620. (In Ukrainian).

TopchievO. H., 2004.Pro predmetnu oblastipredmetsuspilnoyiheohrafiyi [Aboutthesubjectareaandthesubjectofgeography]. Ukrainian Geographical-Journal. № 2. 3–7. (InUkrainian).

TopchievO. H., NudelmanV. I., RudenkoL. H., 2012.Heohrafiyaperednovitnimyvyklykamyizapytamy (ukrayinskyiaspekt) [Geographyinthe face ofthenewestchallengesandrequirements(Ukrainianaspect)]. Ukrainian Geographical Journal. № 2. 3–10. (InUkrainian).

TopchievO. H., Malchykova D. S., 2014. Planuvannyaterytoriy [Planningofterritories]. Hrin D. S., Kherson. 268 p. (In Ukrainian).

Topchiev O. H., Malchykova D. S., Pylypenko I. O., Yavorska V. V., 2017. Kontseptsiya dovkillya – suchasnyi napryam integratsiyi pryrodnycho- ta suspilno-heohrafichnykh doslidzhen [The conception of environment as a modern branch of integration natural- and social and geographical re-

searches]. Ukrainian Geographical Journal. #3. 64–70. (InUkrainian).

VernadskyV. I., 1991.Nauchnaya mysl kak planetnoye yavleniye [Scientificthoughtasaplanetaryphenomenon]. Nauka, Moscow. 270 p. (In Russian).

Yablokov A., Levchenko V., 2015.The decision exists: transition to controlled evolution of the biosphere / The Journal of Philosophy and Cosmology. Vol. 14. 92–118.

Yablokov A., Levchenko V., 2016.The biosphere as a living system. On peculiarities of the evolutionary process on the biosphere level / The Journal of Philosophy and Cosmology. Vol. 17. 152–175.

Yablokov A., Levchenko V., 2017.The Biosphere as a Living System 1. On the Harmonization of Human and Biosphere Relationship / The Journalof Pphilosophy and Cosmology. Vol. 18. 52–83.