Emergence factors and characteristics of landscape science

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Abstract. Followingarticle deals with the landscape science and its formation, stages of development, the role of landscape science as a fundamental science in the system of geographic sciences, as well as some of the problems that have arisen in connection with the branching of the science. For this purpose, researches conducted by leading scientists were analyzed and relevant conclusions were drawn.

1 Introduction

Steven Weinberg, an American scientist and laureate of the Nobel Prize in Physics, said, “I am a physicist, not a historian, but the history of science is fascinating over the years. This is a very interesting topic that covers the history of mankind, and scientists should pay special attention to them. "At the beginning of today's research lies the achievements and successes of our past generations," he noted (Weinberg S. Explaining the world: The origins of modern science. M.: Alpina non-fiction, 2018. - 624 p.). The study of the history of this science has been recognized as a permanent problem in all times [1-6].

If we look at the history of landscape science, the issues of the origin of its theoretical foundations have always been relevant. Because issues such as the history and development of the science are reflected in its content, views about it are clarified. The origin of the landscape doctrine also spans long periods. The scientists who thought about it (V.P. Semyonov - Tyan-Shansky,1928; I.M. Zabelin,1959, 1969; A.G. Isachenko, 1971) called the declines in the development of the science of geography, the object of the science of geography and who pointed out such factors as the lack of unified opinions on the subject, the provision of geographical knowledge in higher education institutions and the opening of geography departments. Therefore, in order to look at the history of landscape science, first of all, it is necessary to clarify the importance of studying the history of science and the emergence of the theory of landscape, which is its theoretical basis [7-9].

2 Materials and methods

The development of geographical science was carried out within the framework of geographical determinism (Latin “determinfre” - to determine, that is, the laws of nature

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determine society) and possibilism (Latin “possibilis” - as much as possible, that is, using nature as much as possible). Major scientists of this period - V.V. Dokuchaev (1899), P. Vidal de la Blache (1913) and others wanted to show the superiority of nature over human society. With the researches of R.I. Abolin (1929) and P.I. Brounov (1910), the need to look at the geosphere on the basis of General Earth knowledge was fully formed. German scientist Bernhard Vareniy tried to prove that Geography is an independent field of science in his book "General Geography".

In order to assess the current state of landscape science and predict its future development, it is necessary to know its history. The formation and development of landscape science as a science is inextricably linked with the names of prominent scientists such as A. Humboldt (1769-1859), K. Ritter (1779-1859), V.V. Dokuchaev (1846-1903).

Further development of landscape science was done by G.N. Vysotsky (1865-1940), G.F. Morozov (1867-1920), L.S. Berg (1876-1950), A.A. Borzov (1874-1939). It was reflected in the works of Abolin (1886-1939) and others too.

At the next stage of the development of landscape theory, S.S. Neustruev (1874-1928), B.B. Polinov (1877-1952), L.G. Ramensky (1884-1953), S.V. Kalesnik (1901-1977) researches and the services of N. Sukachyov (1880-1967) are incomparable. Important scientific results in the field of landscape dynamics and evolution and research in this direction was conducted by B.B. Polinov, L.S. Berg, W.L. Komarov, I.V. Larin and others.

By the 40s of the 20th century, the direction of geochemistry of landscapes was formed as a result of the application of geochemical ideas and methods to the teaching of landscape. One of the founders of this direction is B.B. Polinov (1877-1952).

3 Results and discussion

V. N. Tatishev (1686-1750), continuing the work of B. Varenius, recommended studying natural geographical research in three parts: general (worldwide), specific (within countries) and topography (local). The orientation of A. Humboldt's (1769-1859) "Universe" and V.V. Dokuchaev's (1846-1903) "Teaching of the Laws of Nature" to the scientific basis served to raise Geography to the level of school and higher education. For the first time, it was determined that the common object of geographical sciences consisting of 4 spheres (hydrosphere, lithosphere, atmosphere, biosphere) is the geographical crust, but they were named differently by different authors, for example, in P.Brounov works - outer cover, in R. Abolin works- epigenema. Unfortunately, the upper and lower boundaries of the geographic crust are obtained at different thicknesses of the Earth. In this regard, the scientific works of A. Abdulqasimov, Sh. Zokirov, A. Nigmatov and Kh. Tashov provide complete information [1, 3, 5, 6]. In the 30s of the 20th century, natural geography created a number of independent science and educational areas such as Climatology, Landscape Science, Geomorphology, Oceanology, Biogeography, Soil Geography, Terrestrial Hydrology. In natural geography, a complex regional direction called "Landscape view" has developed in parallel with "General Earth Knowledge View" (A.N. Nigmatov, 2018).

So, despite the fact that there is still a lot of material in the field of landscape science, the lack of logical and theoretical analysis of them is causing problems. To reveal the reasons for this, it is necessary to study the geographical aspects of the development of landscape science.

Today, despite the fact that extensive historical material has been collected in the field of landscape science. It is still known that they have not been logically analyzed, because the analysis of the history of landscape science has its own complex aspects. Firstly, "Landscape studies" belongs to the system of natural geographical sciences. Even about the meaning and scope of the term "landscape", which is the core concept of science, there are a lot of debates, and there are topics that have not reached a conclusion even today. The

opinions of many scientists are important in this regard. For example, the famous landscape scientist A.G. Isachenko said "Landscape science belongs to the system of natural geographical sciences, it can be noted that it forms the core of the sciences in this system and connects them". [4] Second, the introduction of systems theory in the mid-20th century further refined landscape theory. The basis of this theory is the idea that "the Earth's surface is whole due to the exchange of matter, energy, and information, and it consists of large and small geosystems". It is known that landscapes are not topological, but typological geosystems that repeat themselves in areas. Here, the term "landscape" refers to typological geosystems. The science of landscape science is a science devoted to small typological complexes, and when it is approached in this way, its difference from regional and natural geography that is clearly visible.

Thirdly, there are almost no landscapes left in the world today that are not affected by human activity. One or another natural landscape is becoming anthropogenic every day. It has become clear that it is necessary to apply the doctrines created in landscape science in researches in the fields of economics, economic geography, and ecological sciences for effective use of natural resources and their protection. In other words, landscape science is increasingly embodying general geographic content. A well-known landscape scientist, Sh. Zakirov said: "The science of landscape science should have the same importance in the system of geographic sciences as the science of ecology is important in the biological sciences in positively solving the problems of the relationship between man and nature". [3] It is appropriate to quote the following sentences of I.Q. Nazarov among the scientists who reacted to these issues: “Theories of landscape, geosystem, geoecology are the result of the gradual development of geographical thinking. These theories have a powerful force and are considered a scientific methodological program”.

In the article titled “Current theoretical and practical problems of the geography of Uzbekistan, professor H. Vahobov said: "In the field of landscape science, very important work has been done and is being improved in Uzbekistan. But despite this, the monograph "Landscapes of Uzbekistan" or the methodical manual has not been created yet". [2] Here, in conclusion, it is worth noting that it became clear that many general scientific and general geographical problems can be solved based on the created doctrines of landscape science.

Until now, the scientists of our country have conducted several studies with the history of geography. In particular, we can point to R.U. Rahimbekov's and Z.N. Dontsova's "History of Geographical Study of the Nature of Central Asia" (1982) study guide and the research work of A. Ochilov, who conducted research on the history of the study of the nature of Central Asia.

R.U. Rahimbekov and Z.N. Dontsova conditionally divided the geographical aspects of the current stage (1961-1981) of the development of geography in Central Asia into 11 parts. It covers all geographical aspects, and emphasizes the great importance of landscape studies in connection with the development of landscape science at the first constructive stage, that is, the development of deserts and semi-deserts. After that, scientists separately analyzed the issue of zoning. In particular, the natural geographical and landscape zoning of Central Asia was carried out mainly in two directions. Russian scientists (N.A. Gvozdetsky, E.M. Murzaev, G.D. Richter) take into account geological-geomorphological and zonal differences in the general scheme of regionalization of the territory, while scientists of our country (L.N. Babushkin, N.A. Kogay, 1975) favors the traditional ecological-geographical approach. As a result, when dividing the territory of the country, Russian scientists separate the mountains from the plains, while the scientists of our country combine the mountains and the plains on the basis of the ecological regime. [10,11]

The study of the history of the development of landscape science shows that there were not any specific studies on periodization, and the authors have been working on the basis of different principles in periodization.

Table1. Development of landscape science in Uzbekistan (according to the studies of M.K. Ergasheva, 2021).

№	Periods	Meaning of the periods	Methodological basis	The main scientists
1	The first period (until the 60s of the XX century)	Creation of methodological foundations of landscape science in our country	Discovery of commonalities in zonal and azonal laws, interdependence of plains and mountains in the country.	L.S. Berg (1913), R.I. Abolin (1929), N.L. Korzhenevsky (1960), V.M. Chetirkin (1960), T.V. Zvonkova (1962)
2	Second period (1960 – 1990 years)	Developing of landscape science teaching and improving of national landscape science in Uzbekistan	Soil, landscape and geosystem education	L.N.Babushkin, N.A. Kogay, M. Umarov, P. Baratov, S. Nishonov, P. Gulomov, M. Umarov, Yu. Sultonov, A. Saidov, S. Nishonov, A. Abdulkasimov, L. Alibekov, T. Jumboev, A. Rakhmatullaev, Sh. S. Zokirov, S. Abdullaev and others
3	Third period (1992 y. – till now)	Modern landscape science and its branches	Wide application of landscape, geosystem and ecological sciencrs	A. Rafikov, A. N. Nigmatov, S. B. Abbasov, A. Urazbaev, I. Hasanov, H. Vahobov, I. Q. Nazarov, K. Boymirzaev, A. Ravshanov and others

Note: *The table was created by author.*

The study of the development of the landscape science is the main purpose of the study, while research in the process of the landscapes, the formation of the ideas should be analyzed by the foundation of philosophical and geographical worldviews. This is important to study and differentiate the external or socio-economic factors. The evolution of the landscape science is the result of the factors influencing the development of natural geography.

4 Conclusion

In order to study the development of the science of landscape science as the main goal of the research, firstly, the researches in the processes of the creation of the idea of landscape should serve as a foundation. Secondly, their results should be analyzed with a combination of philosophical and geographical worldviews. For this, it is important to study and distinguish external or socio-economic factors. The evolution of the landscape doctrine is the result of factors that influenced the development of the science of natural geography.

In its early days, landscape studies was considered country studies and claimed the entire geography. Gradually, it began to move from country studies to natural sciences. Such a transformation led to an upsurge of philosophical restructuring in geography, and as a result, landscape science acquired the status of regional natural science.

Geographers recognized the 19th century as "the century of natural sciences". In this period, besides geography, several sciences, including geology, climatology, botany, zoology, soil science, were separated and formed as an independent science. From the last decades of this century, the theoretical idea of landscape science - the foundation of landscape teaching - began to be created. The unity of nature, zonation, the "horological concept", the doctrines of soil and forest served as the basis of the doctrine of landscape.

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