

THE IMPACT OF NATURAL LANDSCAPE ON HISTORICAL URBAN SPACE: THE CASE OF VINNYTSIA CITY, UKRAINE

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Abstract

The article deals with the architectural and spatial development of historical cities of Ukraine under the influence of natural landscape determinants by the case of Vinnytsia city. This issue still remains poorly studied, since the formation of the urban space of Ukrainian cities was mainly studied as a socio-historical phenomenon.

The purpose of the article is to identify the peculiarities of the natural landscape situation, to disclose the regularities, features and basic principles of the influence of natural landscape factors on the architectural and spatial evolution of the city.

The work is based on the complex use of general scientific and special research methods. It has enabled us to comprehensively consider the source base, analyze the state of the research and establish the main problems of urban space development, taking into account the landscape component at the present stage.

It is established that in recent years the urban space of Vinnytsia is being actively transformed. That is why the study of the urban environment: the identification of factors that influenced the formation and development, in particular natural landscape, will help urban planners and designers to enhance the architectural and artistic expression of modern urban space.

Key words: natural landscape, castle, urban space, urban planning, Vinnytsia, the Southern Bug.

1. INTRODUCTION

In recent years, significant socio-cultural, political and economic changes have taken place in Ukrainian society and led to the formation of a new Ukrainian identity and the reconsidering of the meaning of national values. The prominent place in the material and spiritual heritage of Ukrainian people is held by cultural monuments that vividly reflect the leading ideas of the time.

On the territory of Ukraine, a significant number of architectural monuments of national and local significance have been preserved. The pearl of the Podolsk region is the city of Vinnytsia, whose history is intimately connected with the cultural and national formation Ukrainian people.

The research of regional and local lore history is an important mean in building an integral concept of the development of national culture. Features of socio-economic and ethno-cultural development of Podillia led to the formation of a peculiar architectural and urban space. Having analyzed the literature sources, it was determined that, mainly Polish scientists were engaged in the study of Podillia region in the first half of the 19th century in the context of the history and culture of the Polish-Lithuanian Commonwealth, among them were: J. Rolle [1], V. Marcinsky [2] and others. An important historical and statistical work, including essays on cities and settlements, is the publication "Parishes and churches of the Podolsk diocese" edited by E. Sytsinsky [3]. Analysis of the formation features of spatial organization and the architectural and artistic image of Vinnytsia is covered in the scientific works by Omicron [4], O. Byrulia [5], L. Cherleniovskiy [6] and others. The studies of Ukrainian scientists of the new era are the works that reveal the issues of architectural and urban planning development of Vinnytsia and the problems of preserving the historical and cultural heritage, for example, scientific and practical works by S. Tsarenko [7], L. Denysova [8], V. Vechersky [9], Malakov, D.V. [10], Podolynyi A. [11] and others. However, most works on the history of architecture and urban of Vinnytsia are devoted only to particular historical periods.

2. NATURAL LANDSCAPE FACTORS OF URBAN PROCESS

The urban planning process in Ukraine was accompanied by the influence of various factors (public, political, administrative, social, demographic, etc.), which in their complex determined the direction of this process. Among them there is a separate group of natural landscape factors that directly influenced the emergence and formation of the architectural, spatial and planned structure of Ukrainian settlements.

To the main natural landscape factors that influenced the urban planning process in Ukraine belonged hydrography (natural rivers, streams, marshes and artificial canals, ditches, ponds), relief (plains, valleys, hills, ravines, mountains), soils (chernozem, meadow, light gray, dark gray, peaty and marshy, soddy) and the degree of their fertility, vegetation (forests, fields, meadows, steppes) [12].

2.1. The formation features of Vinnytsia urban environment until the end of the 19th century

Since ancient times, favorable natural and landscape factors have played a dominant role in choosing the location of the settlements of people. The territory of the modern Vinnytsia city has been inhabited since the Bronze Age, and from the middle of the 10th century on the banks of the Bog river (now the Southern Bug) dominated the tribes of ulychi and tivertsy, that were the part of Kyivan Rus [13].

Each of the periods of the formation, development or decline of the urban environment is connected with the socio-political life of the region. The foundation of the Vinnytsia chronicle from 1363 is commonly associated with the princes Koriatovych and the attempt of the Grand Duchy of Lithuania to establish its dominance in Podillia. Until now, the exact location of the first Vinnytsia castle has not been accurately determined. According to the description of the city in the lustration of the Kyiv land in 1471, and to the revision of Vinnytsia Castle in 1545, it is known that there were two wooden castle fortifications on the left bank of the river Bog (now the Southern Bug river) around which the settlement "Old City" was formed. [1]. With the method of analysis of literary sources it is found that the creation of a stable planning structure of the city began only at the end of the 16th century after the foundation of the Polish-Lithuanian

Commonwealth (according to the Lublin Union in 1569) and the transformation of Vinnytsia in 1598 into the administrative center of the Bratslav voivodeship. [3].

Considering the borderline position of the Bratslav region, the need to develop, repair and modernize defensive fortifications increased. The new situation of the city also contributed to the cultural, commercial, economic, and architectural development of Vinnytsia. Due to the Polish magnates, scientists and artists Vinnytsia at that time experienced significant development of the urban planning system. During this period, new principles of settlement, development of territories and defense activities, which were worked out by Sh. Starovolsky, K. Opalinsky, G. de Boplan (Fig. 1) and other urbanists of Poland, were applied [3].



Figure 1.

Vinnytsia on the special map by G. de Boplan, 1650. (North at the bottom) [13]

For the construction of the right-bank of New City, a significant effort was made by the Polish headman Valentyn Kalynovsky (1604-1613) [2]. He built a new castle (1604) on the artificial island called Kempa of the Bog river (now the Southern Bug) and in 1610 he made a donation to the Jesuit college that was settled in Vinnytsia. They built a church, collegium (school), a konvikt (hostel), surrounded by thick brick walls with corner towers. This complex received the eloquent name "Mury" and survived to our time, despite significant losses. Together with the constructions of the Dominican monastery (laid about 1624), the Jesuit institution became the main fortification of the New City [13].

In its architecture, the stone structures of monasteries did not differ much from similar fortress defensive constructions. The walls and towers of the monasteries with various surrounding economic and residential buildings, which concentrated around the building of the temple, created a picturesque architectural ensemble, harmoniously connected with the surrounding natural landscape. The river was used by

monasteries not only for economic purposes – it was also important for the defense, completing it with natural water obstacles [4]. As Omicron once wrote: "...The city was destined to survive a number of military storms and the era of "ruins". And since the Mury was a strongly fortified place, it had to withstand the siege more than once and cover both the host and the civilian population within its walls..." [11].

Thus, the urban planning composition of Vinnytsia at that time included the New City and Old City spatial system, which were simultaneously developed, considering the landscape component and functional needs. Using a comparative and historical method, it was found out that at the evolution of the city, the natural components of the landscape experienced a significant impact of human activity and they were used in accordance with urban trends.

In the late 17th and early 19th centuries Vinnytsia was expanding geographically: new quarters were being formed: Zavallya or New City (Fig. 2), near the Letychiv Gate; in the southwest of the city – the suburb of Sadky; On the left bank of the Southern Bug near the Old City appeared the Dubovetska Slobidka, over the Vinnychka River - the Old Hutory. According to the revision of 1764, the Old City had 162 houses (Christians farms 75, Jewish estates 87), and in New there were 123 (of which only 16 were Christians, 36 were yards of gentry), in the suburbs of Sadky were also registered 24 farms [10].



Figure 2.

The view of the New City from Zamostya, a photo by Reicher, the end of the 19th century [11]

After the second partition of Poland (in 1793) Podillia and Bratslav were passed into possession of the Russian Empire and formed the Podilsk province [2]. The city becomes the center of the Vinnytsia district (uyezd), and at the beginning of 1798 the "City Regulation" was introduced and since then the gradual growth of the city and the formation of the urban planning system became rather noticeable.

2.2. The Importance of natural factors in the formation of the urban planning system of Vinnytsia in the late 19th and early 20th centuries

According to Jay W. Forrester, the city is a complex multi-level dynamic system that has got the form of a social system and finds itself in the surrounding environment it interacts with [14]. The urban planning system of Ukrainian cities was formed in specific natural conditions and always included elements of the natural complex. Natural conditions also became the most important factor that determined the choice of a planning solution in the 19th centuries. In this sense, the natural landscape can be considered as a complex of various kinds of urban resources. Their estimation is made both from positions of building manufacture, and from a position of the organization of all kinds of industrial and non-productive activity. However, it is well to bear in mind, that in the 19th centuries elements of nature were largely deformed by human activity.

Along with the change in the social and economic structure, after the construction of the Kyiv-Balta-Odessa railway near the city in 1871, the implementation of the reform of local government and the establishment of the city council, significant changes began in the planning structure of Vinnytsia (Fig. 3). The development of the manufacturing industry, the streamlining of city streets and the precise formation of the quarterly development of the Zamostya district (in accordance with the general plan of 1839) the emergence of new building materials and technologies, gradually formed a new architectural and artistic expressiveness of the city. Vinnytsia, with a population of more than 34 thousand people, gradually turned into a powerful administrative and cultural center of Podillia [9].



Figure 3.
Urban planning structure of Vinnytsia on the map of 1913

Despite the attempts of the Russian authorities to introduce the classical regular city planning, it was established by the graph-metrological analysis of historical maps that Vinnytsia kept the chaotic parcelling of the building sections for a long time.

The spatial development of the city was carried out in two areas: within the Old and New City. However, the harmonious dynamic development was giving to the urban planning form of the New City. Due to the fruitful work of the Mayor M. Ovodov (1899-1917) and the chief architect G. Artinov (1900-1919), Vinnytsia received new well-planned broad streets and boulevards. In total, in the city there were 44 streets, 11 lanes and 6 squares in 1911 [5].

Urban space of Vinnytsia, which was formed along the central highway of the New City – Poshtova Street (now Soborna St.), was a reflection of the functional and spiritual needs of the society of that time. Along the main axis of the city, which began from Kalich and went to the bridges, crossing the city from west to east, the main administrative, cultural and educational institutions were built.

Most of the buildings under construction at that time had spatial accents in the urban landscape, which was primarily due to the contrasting combination of its clear architectural shapes with the forms of the natural environment around them. The building not only entered into active interaction with the spatial structure of the natural environment, but also formed its own architectural space, additionally revealing the structural features of the natural landscape, for example, the building of the City Council (1911), the District Court (1912), the City Theater (1910), the building of the Women's Gymnasium (1901), the water tower with the first constructions of the Vinnytsia water supply (1912) and others. The development of the system of engineering networks contributed to the construction of large buildings, such as the Savoy Hotel (1913) [7].

Nowadays the construction of the New City forms the central historical area of Vinnytsia.

In the early 20th century G. Artinov, the chief architect, implemented new planning principles for the formation of urban space. In 1913, the first tram line of connection "Station - Women's Gymnasium", in length of 8.6 km was opened on Poshtova Street. A new phenomenon was the creation of recreational areas in the city's structure. Thus, on Poshtova Street from the women's gymnasium to the first six-storey hotel "Savoy" was arranged a boulevard named after the mayor M. Ovodov [7].

An important sports and cultural center were the banks of the Southern Bug river and the island in the Kumbar area. V. F. Korenev, a teacher of drawing in a real college, in the spring of 1910, at the expense of Count Grokholsky and other well-off Vinnytsia residents, created a school of water sports. Later, the sports town for young people would have its own structure of beach, swimming pools, playgrounds, park and yacht club "Sport" [7].

The formation of the Vinnytsia region in 1932 within the USSR and the assignment of the status of the regional center to Vinnytsia became a significant impetus for the development of the city. At that time, the urban space was being actively improved, and the communal economy was being rebuilt: the streets were being cobbled, new water mains and sewers were under construction, new tram ways were being laid. In 1934 the project of the general plan of Vinnytsia was approved, that was developed by a group of designers under the guidance of architect A.D. Gurovich of Kharkiv branch "Dnipromisto". The streets of the historic center became modern, such as the Lenin Street (now Soborna St.) and the Dzerzhynsky Street (now

Teatralna St.). A lot of squares and parks appeared on the city map. So in 1936 the Gorky Central Park of Culture and Rest was created with an area of 29 hectares [6].

The urban planning system of that time was developed in accordance with Soviet paradigms. So well-known urbanist Z. Yarhina [15] claimed that the term "urban planning system" is a set of spatially organized and interconnected material elements of technically developed territories, buildings and structures, roads and utilities that together with natural components forms the environment of social activity in various territorial levels. The human influence in this system is not considered. Therefore, the development of Soviet cities had a utilitarian character.

Only in the 1990's there was reconsidering of the concept of urban planning system in the Ukrainian urban studies thanks to prof. M. Demin [16], who provided rationale for the socio-economic component and established the connection "population-environment-activity."

3. MODERN PROBLEMS OF PRESERVING THE HISTORICAL URBAN SPACE AND THE DEVELOPMENT OF PUBLIC SPACES, TAKING INTO ACCOUNT THE NATURAL-LANDSCAPE COMPONENT

Today Vinnytsia (Fig. 4) is one of the largest cities of the Right Bank Ukraine, the largest city of Central Ukraine, the administrative and territorial center of the Vinnytsia region. The total area of the city is 68.68 km², and the population is 371.4 thousand people (2012). Vinnytsia is actively developing as an industrial and administrative center of the region, is connected with other regions of the state [17].






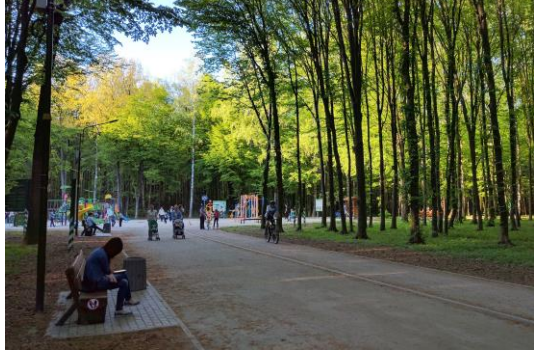
Figure 4.

The central part of the Vinnytsia. Photo by author, 20.04.2018

In modern conditions, the identity of Ukrainian cities is determined by the skillful use of natural landscape factors, which resulted in the formation of a unique architectural and artistic image of the city (Table 1). However, the traditional instruments and means of spatial development of the Soviet and post-Soviet periods corresponded mainly to the ideology of the industrial age with the leveling of the value of a human. The negative effects of this policy have led to the fact that in Vinnytsia the urban planning system has been formed of relatively low quality with irrational use of resources.

Table 1.

The modern urban spaces of Vinnytsia

Description	Images
<p>European Square. Pedestrian zone. Created a comfortable space for the residents of the city and tourists. Provided conditions for organizing and holding various holidays. Beautified the park zone, installed a fountain and children's playgrounds. (Photo by author, 29.04.2018).</p>	
<p>Kosmonavtiv Avenue. There is a pedestrian zone, a bicycle lane, a recreation area, playgrounds. Installed fountains. New trees are planted. Mounted street lights with gadget chargers and surveillance cameras. (Photo by author, 29.04.2018).</p>	
<p>Roshen multimedia fountain and Roshen embankment. It is in the top ten of the most spectacular fountains in the world. There were done the works on embankment reconstruction and cleaning the Southern Bug river. There are recreation areas and playgrounds on the ground of mini parks. (Photo by author, 29.04.2018).</p>	
<p>Forest Park. It is a prominent civic center and covers 0,07 km². There is a children's playground, sports equipment and gazebos. Created a seating area with benches and a Wi-Fi network. Mounted the street lightings and video surveillance. There is bicycle paths and bike rental facilities. (Photo by author, 29.04.2018).</p>	

To form a comfortable urban space in modern conditions, it is important to appeal to people, says Danish architect and new classic urbanism Jan Gehl [18]. The interests of people, their values, relationships, attitude to the city and the environment - all this forms the image of the city and the quality of the environment in which they live.

Today Vinnytsia is a vivid example of the effective implementation of best practices of the integrated concept of urban development in Ukraine. Thanks to the fruitful cooperation of the city administration, domestic architects and foreign urbanists, in particular the Swiss urbanist Urs Thomann, in 2015 the "Integrated strategy of transport and spatial development of the city of Vinnytsia" was developed [19]. This strategy demonstrates the approach, helps to avoid huge budget investments in urban infrastructure and at the same time is an effective tool for supporting sustainable urban development.

Using the method of field surveys and generalization of previous research results (Fig. 5), it is possible to determine the directions of further development of the urban space of Vinnytsia taking into account the natural landscape. The central historical area of the city, formed on the banks of the Southern Bug river, is a common use area of a modern city that requires to be revitalized. Appropriate measures were included in the city program "Development Strategy Vinnytsia-2020" [17], which provides for the formation of a continuous network of public spaces and recreational areas.



Figure 5.

The central part of the Vinnytsia. For the effective use of the coast of the Southern Bug, there are needs works on river bed cleaning and the river banks stabilization. Photo by author, 20.04.2018

Today, public spaces are formed in accordance with the urban landscape, using elements of municipal improvements and features of the city structure. That is why Vinnytsia should fully use of the potential of its

development as the city is located on the banks of the Southern Bug. The river should become not just a border between the eastern and western parts of the city, but also the functional axis of the urban environment. To do this, the opportunities for using the river and the coastal strip should be expanded to organize cultural events, recreation, sports and leisure. Also, one of the priorities of urban programs is to preserve a clean and green environment in the long term.

4. CONCLUSIONS

The article reflects the results of the analysis of the mutual influence of natural resources and the dynamic urban environment of Vinnytsia during various historical periods. The obtained results can be used in the preparation of regional and popular scientific publications; at developing or adjusting the general plan of Vinnytsia, in particular the historical and architectural reference plan. On the basis of the conducted studies it was established the following:

1. The formation of the urban planning system of Vinnytsia was due to the complex effect of all natural and landscape factors, among which the dominant factor was hydrographic.
2. In the New City of Vinnytsia during the 17th and 19th centuries it was fixed the basis of further development for right-bank urban planning forms. It was linearly oriented, compositionally connected with the watershed and embankment slopes of the landscape urban formation which is peculiar to cape of urban areas of the Right-Bank Ukraine;
3. In the 19th and 20th centuries, the interaction of natural and anthropogenic landscapes was manifested in bilateral interaction in the formation of the urban planning system of Vinnytsia. Unlike the previous centuries, nature became not only the main condition (resource) of the compositional and spatial development of the city, but also the material component of the technogenic system.
4. It has been established that today the central historical area of Vinnytsia is of great importance for the formation of a new socio-cultural identity of the population. Therefore, the objects of architectural and urban heritage should be included in the overall urban planning system. It has been also found a new value of natural resources, in particular, the bank of the Southern Bug in the urban space.

REFERENCES

- [1] Rolle, E.A. (1864). *Zameczki Podolskie na kresach multańskich*. Krakov: Druk. WL.L.Anczyca I
- [2] Marczynski, W. (1820). *Statystyczno-topograficzne s histiryczne opisanie gybernii Podolskiej z rysunkami mappami*. Wilno: Józef Zawadzki
- [3] Setsinski, E. (1911). *Historical places of Podillia and their sights*. Kamenets-Podilskiy: Printing house of the svyatotroitskyi brotherhood.
- [4] Omikron. (1914). *Mury of Vinnytsia – the source of education in the province*. Vinnytsia: The typography of the city council.
- [5] Byrulia, O.V. (1930). *Architectural History of Vinnytsia*. Vinnytsia: State Printing.
- [6] Cherleniovskiy, L. and Zoria, Yu. (1940). Reconstruction of regional centers: Vinnytsia. *Architecture of Soviet Ukraine*, 7, 4-7.

- [7] Tsarenko, S.H. and Soleiko, E.V. (2012). *Star of Gregory Artynov – the first urban architect*. Vinnytsia: The New Book.
- [8] Denysova, L.M. (2012). A city with modest admiration. In L. M. Zahorodnia (Ed.), *Architectural Vinnitsa: time, space, personality. Almanac*. Vinnytsia: PP "PRAD ART", 15-31.
- [9] Vecherskyi, V.V. (Ed.). (2011). *Historical and urban studies: Vasykiv, Vinnitsa, Horlivka, Izmail*. Kyiv: Institute of Monument Protection Research.
- [10] Malakov, D.V. (1988). *By Bratslavshchina: From Vinnytsia to Tulchin*. Moskov: Art.
- [11] Zinko Yu.A. and Podolynyi A. (Eds.). (2016). *Monuments of history and culture of Vinnytsia region. Vinnytsia*. Vinnytsia: LLC "Nilan-LTD".
- [12] Tymofiienko, V.I. (Ed.). (2003). *The history of Ukrainian Architecture*. Kyiv: Technique.
- [13] Tsarenko, S.H. (2015). *City of Vinnytsia. The historical guide-book of architectural heritage*. Retrieved from: <http://ru.calameo.com/read/004798737901a1f806d3c>.
- [14] Jay W. Forrester. (1969). *Urban Dynamics*. M.I.T. Press, Cambridge, Mass.
- [15] Yarhina Z.N. (1986). *Fundamentals of the theory of urban planning. Textbook for high schools. Specialty "Architecture"*. Moscow: Stroyizdat.
- [16] N.M. Domin (Ed.). (1991). *Management of the development of urban planning systems*. Kyiv: Budivelnik.
- [17] <http://www.vmr.gov.ua/TransparentCity/Lists/StrategyVinn2020/Default.aspx>
- [18] Jan Gehl. (2010). *Cities for people*. Washington, DC : Island Press.
- [19] Urs Thomann. (2016). *Contemporary urban development in Ukraine: the Vinnytsia case*. Retrieved from: <https://mistosite.org.ua/en/articles/v%D1%96nnytsya>