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## VALUE DETERMINATION OF WATER SYSTEMS IN HISTORIC GARDENS AS THE FOUNDATION OF GARDEN ART WORKS

### OKREŚLENIE WARTOŚCI SYSTEMÓW WODNYCH W OGRODACH HISTORYCZNYCH JAKO PODSTAWA OCENY DZIEŁA SZTUKI OGRODOWEJ

#### Abstract

The value of water systems in Ukrainian historic gardens and parks (founded in the 17th–19th centuries), which are formed on the natural beds of rivers and creeks, is disclosed on the example of their general planning structure and composite construction. The main principles of garden art works in these parks had a strong influence on the methodology of planning contemporary green areas, particularly in and around the “energy independence” of water systems. The modern trend of the integrated approach in architectural-landscape organization of streamside territories are shown in the author’s projects proposals.

*Keywords: historic park and garden, dendropark, water system, natural riverbed, ravine, hydro technical implements, composite axle, center, node, scenario, water perspectives, visual links, architecture of water, energy independence, architectural-landscape organization of streamside territories*

#### Streszczenie

Wartości systemów wodnych w ukraińskich historycznych ogrodach i parkach (zakładanych w XVIII i XIX w.), które uformowane zostały w naturalnych korytach rzek i potoków, zostały ukazane na przykładach ich ogólnej struktury planistycznej i konstrukcji kompozycji. Główne zasady dzieł sztuki ogrodowej tych parków miały wielki wpływ na współczesną metodologię planowania terenów zielonych, a zwłaszcza zagadnień związanych z wykorzystaniem systemów wodnych jako niezależnych źródeł energii. Nowoczesne trendy zintegrowanego podejścia do architektoniczno-krajobrazowego planowania terenów przystrumienowych zostaną przedstawione na przykładach autorskich projektów.

*Słowa kluczowe: historyczne parki i ogrody, parki dendrologiczne, systemy wodne, naturalne koryta rzeczne, wqówó, urządzenia hydrotechniczne, osie złożone, centrum, węzeł, scenariusz, perspektywa wodna, powiązania wizualne, architektura wody, niezależne źródła energii, architektoniczno-krajobrazowa organizacja terenów przystrumienowych*

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## 1. INTRODUCTION

Recent trends and social intentions regarding environmental protection and restoration, and widespread of sustainable technologies now emphasize the possibility of applying the legacy of landscape architecture achievements of the past. From this point of view it's very interesting to investigate the experience of historical landscape park architects concerning their use of natural environmental conditions.

## 2. THE AIM OF RESEARCH

River watercourses, these very important components of the natural environment, always played a significant role in forming park territories. The main aim of this study is identification and disclosure the importance of *water systems* in historic gardens. In it the main attention has been focused on historic landscape parks founded in the 17<sup>th</sup>–19<sup>th</sup> centuries in Ukraine.

## 3. THE WATER SYSTEMS OF HISTORIC PARKS

The experience of park culture illustrates how the exploitation of existing natural water basins, accompanied by wide usage of favourable environmental conditions, allowed *unique extraordinary park water systems* to be created. Flowing basins, such as rivers, streams, ponds, canals etc., actively influenced the planning structures of parks; and they often became important compositional elements such as axes, centers or nodes (connections, links). Parks also give us examples of exceptional planning decisions in the case of individual scenarios of varying the impression while moving along the main compositional axis, coinciding with river basins, panoramic landscape views, water perspectives, visual links with surrounding buildings, etc. There are important examples of using the aesthetic qualities and physical features of the water in various water implements, artificial hydro structures and devices: cascades of ponds, waterfalls, fountains, grottos, pools and creeks. While being an essential part of the landscape, these engineering implements play a significant role in the composition of the water basin and surrounding territories.

The "Trostyanets" state dendropark was founded by Ivan Skoropatskiy in 1832–1833. The park was sited on the territory of a steppe. First, the *Great pond* was formed based on springs<sup>1</sup>. The first period of park creation took about 30 years. The next step was the foundation of the relief of the territories. Thus today we have a 35 m height difference between the upper and lower marks of the territory<sup>2</sup>. The park's water system consists of the *Great pond* and two basins on a more moderate scale – *Swan lake* and the *Kuziha* pond. These ponds are the main elements in the general composition of the garden. Due to the absence of any architectural landmarks inside the park, all the compositional diversity is achieved by the integration of greenery, relief and water<sup>3</sup>.

<sup>1</sup> *The quick reference of architect: landscape architecture*, (ed.) I.D. Rodichkin, Budivel'nik, Kiev 1990, 45.

<sup>2</sup> *The Gems of the Eastern Chernihiv region. The popular science edition*, (ed.) V. Ochered'ko, Gamma-print, Kiev 2010, 56.

<sup>3</sup> V. Gosrev, N. Juskevich, *Garden and park planning*, Strojizdat, Moscow 1991, 49.

• STATE DENDROPARK "TROSTYNETS", V. Trostyanets, Chernigovskiy region

a



- Foundation – 1832–1833 years;
- Area – 204,7 hectares;
- Water system – 3 ponds.

• NATIONAL LANDSCAPE PARK "SOFIYEVKA", UMAN

b



- Foundation – 1796–1800 years;
- Area – 179,2 hectares;
- Water system – the bed of one small river

• DENDROPARK "ALEXANDRIA", BILA TSERKVA

c



- Foundation – 1784–1786 years;
- Area – 201,5 hectares;
- Water system – 3 small watercourses on the bank of large river

- III. 1. The historic landscape parks, founded in the 17th-19th centuries in Ukraine: a – "Trostyanets" State Dendropark; b – "Sofiyevka" National landscape park; c – "Alexandria" Dendropark
- II. 1. Historyczne parki krajobrazowe zakładane w XVIII-XIX w. na obszarze Ukrainy: a – Państwowy park dendrologiczny Trostyanets; b – Narodowy park krajobrazowy Sofiyevka; c – Park dendrologiczny Alexandria

The most famous monument of landscape architecture in Ukraine is the *Sofiyevka* historic park, which was established by Earl Pototsky as a gift for his wife Sofia<sup>4</sup>. The main compositional element of the park is the artificially improved natural riverbed of the *Kamianka*. All park objects and scenes are either inscribed into the riverbed or oriented towards it. The improved natural riverbed plays the role of axis for the variation in impressions and step-by-step uncovering of the park's theme – Ancient Greek myths and legends<sup>5</sup>.

Another example of historic park is the *Alexandria* dendropark, established in Bila Tserkva in 1784. This was a kind of suburban residence for the Branitsky family. The general inclination of park territories towards the riverbed of the *main river Ros* and the existence of 3 ravines determined the main compositional solution in the park<sup>6</sup>. It consists of 4 landscape zones. The system of ponds and dams created along each ravine play the role of space planning axes, which finally connected with the water space of *Ros* river on the south measuring of the park.

<sup>4</sup> I. Kosenko, G. Hraban, V. Mifin, V. Garbuz, *Dendropark Sofiyevka. 200 years anniversary*, Naukovadumka, Kiev 1996, 66.

<sup>5</sup> *The quick reference...*, 44; S. Ozhegov, *History of Landscape Architecture: the tutorial for spec. "Architecture"*, Strojizdat, Moscow 2003, 148.

<sup>6</sup> L. Mordatenko, V. Gaydamak, S. Galkin, *Dendropark Alexandria. Guide-book*, Naukova dumka, Kiev 1990, 47-50.



III. 2. "Alexandria" Dendropark, the spatial decisions in the park territory along the *middle ravine* (photo by L. Ruban)

II. 2. Park dendrologiczny Alexandria, decyzje przestrzenne (fot. L. Ruban)

#### 4. A COMPARISON OF THE WATER SYSTEMS OF HISTORIC PARKS

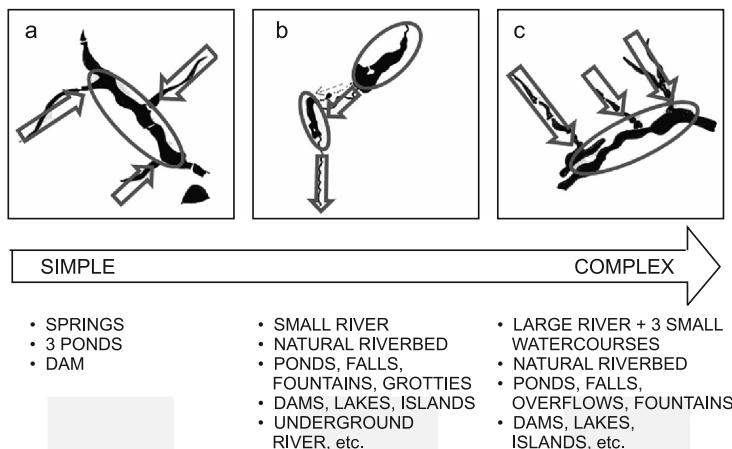
Water resources play an important role in planning. The examples described above illustrate the great value of *water systems* for the composition of each park. Water dominates in these parks with all its possible appearances: through basins, waterfalls, and water surfaces to tiny fountains and wellsprings. *The water system* of a park defines the compositional centre or axis of the park's general plan and unites various hydro technical facilities, serves as a leitmotif for varying the impression while walking through the park, and reveals the unique features of every ensemble<sup>7</sup>.

Combining the hydro technical and aesthetic approaches in the territory of the park allows the creation of varied landscape images with the assistance of water realisations and architecture, and unforgettable impressions from colossal or chamber park spaces.

The comparison of *the water systems* of various historic parks shows that the *park water system* can be formed from a simple combination of several ponds and lakes (as shown by the "Trostyanets" dendropark), or be developed on the basis of transformation and improvement of the natural riverbed (e.g. the "Sofiyevka" landscape park), or may be quite complex: by combining several compositional planning axes (like the "Alexandria" dendropark).

In each case, the creation of the *water system* was founded on the basis of a thorough investigation of the existing natural conditions, such as water flows and sources, territory relief and local vegetation. Deep utilization of the natural conditions of water resources made it possible to create *unique water systems* for every park ensemble.

<sup>7</sup> L. Ruban, *The water systems of historic parks: to the question of principle arrangement*, The modern problems of architecture and town planning. The scientific collected volume, № 31, KNUCA, Kiev 2012, 169-180.



#### THE DESCRIPTION OF WATER SYSTEMS OF PARKS

- III. 3. The description of the water systems of Ukrainian historic parks: a – "Trostyanets" State Dendropark; b – "Sofiyevka" National landscape park; c – Alexandria Dendropark
- II. 3. Charakterystyki systemów wodnych ukraińskich historycznych parków: a – Państwowy park dendrologiczny Trostyanets; b – Narodowy park krajobrazowy Sofiyevka; c – Park dendrologiczny Alexandria

## 5. THE ARCHITECTURAL-LANDSCAPE ORGANIZATION OF STREAMSIDE TERRITORIES

Historic parks – monuments of horticultural and park architecture – are the gems of their regions; not only do they reflect the local natural landscapes, but they are world famous national and humanity treasures. Historic parks require guarding, protection, support and further development. Guided by such protection politics historic areas have a great impact on the planning of bordering territories. The analysis of the planning practice in the riverstream territories of the *Kamianka* river in *Uman*<sup>8</sup>, dating from different periods, shows this fact. The historic layout of the "Sofiyevka" park, dating from the 19<sup>th</sup> c., is protected in accordance with the proposals for a general plan for its improvement, renovation and widening worked out in 1990<sup>9</sup>, several years before the 200-year anniversary of the park.

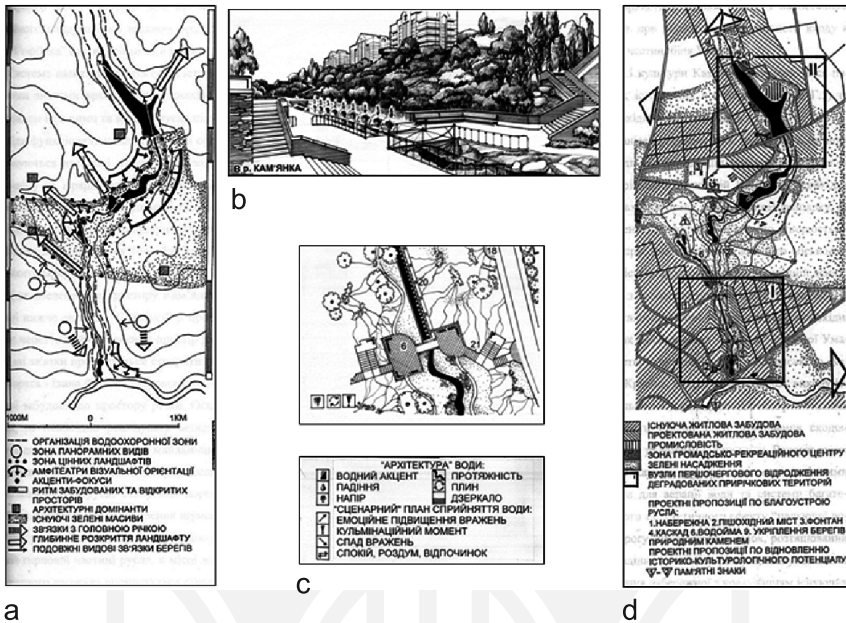
The author's project proposals for the *architectural-landscape organization of the streamside territories* of the *Kamianka* river in *Uman*<sup>1</sup> city concerned the spatial organization of the landscape, functional planning organization, their inclusion in city structures, establishing the link between the open spaces of the tributary and the city's main river – the *Umanka* – enhancing the city's environment and improving the level of city beautification, discovering the historic cultural potential of the territories, and the use of various methods of water architecture<sup>9</sup>. These proposals are valued for their integrated approach to the riverside territories of *Kamianka*<sup>10</sup>.

<sup>8</sup> I. Kosenko, G. Hraban, V. Mitin, V. Garbuz, *Dendropark Sofiyevka...*, 100-125.

<sup>9</sup> L. Ruban, *The principles of town-planning use of territories under conditions of degraded rivers*, Ph.D. thesis, specialisation 18.00.04 "Town planning and landscape architecture", KNUCA, Kiev 2000, 163.

<sup>10</sup> L. Ruban, *The architectural-landscape organization of streamside territories: the tutorial*, (ed.) T.F. Panchenko, KNUCA, Kiev 2013, 63.





THE PLANNING PRACTICE OF RIVERSTREAM TERRITORIES  
 OF KAMENKA RIVER IN UMAN (Architect RUBAN L.)

- III. 4. The architectural-landscape organization of the streamside territories of the Kamianka river in Uman', Ukraine, project by arch. L.I. Ruban: a – the organization of landscape areas; b – panoramic view of river valley; c – the planning of the separate plot; d – the functional-planning organization of riverside territories
- II. 4. Architektoniczno-krajobrazowa organizacja terenów przysturmienowych rzeki Kamianka w Uman na Ukrainie, autor projektu arch. L.I. Ruban: a – organizacja stref krajobrazowych; b – widok panoramiczny na dolinę rzeki; c – projekt wyodrębnionej parceli; d – funkcjonalno-planistyczne rozwiązania terenów przyrzecznych

## 6. CONCLUSIONS

So, with this material in mind, it's possible to conclude, that:

1. The design of landscape parks is consistently tied to natural features of the environment and also the water resources. *The water systems* of each park were built on the basis of a deep analysis of local conditions, respective transformation in accordance to the artist's creative conception, and a high quality of construction activities and general environmental development. Each *water system* serves to water the territories in order to create a unique park complex.
2. River watercourses – very important components of the natural environment – always played a significant role in forming park territories. Each park gives us an example of exceptional planning decisions, individual scenarios which vary the view while the visitor moves along the main compositional axis, coinciding with river basins, panoramic landscape views, water perspectives, visual links with surrounding buildings, etc. Unique and various by their design complexity, the *water*

systems were created in parks – through an uncomplicated, almost natural system of ponds in *Trostanets* to complex engineering solutions in *Alexandria*.

3. While being an essential part of the landscape, these engineering solutions play a significant role in the composition of the water basin and surrounding territories. Thus besides its utilitarian practical value, the architecture of hydro structures complements and harmonizes the direction of the general style and high requirements for the design of the architectural landscape environment.
4. On the example of analysis of various historical park water systems it's possible to determine the common features of their *energy independent principle* design: efficient usage of existing local water balance; establishment of self-flowing sluice ways, use of height differences and other specifics of the landscape in order to create unique water emphases, "pictures", views, internal sceneries, diversity of engineering hydro technical implementations of water systems, and their high architectural stylish expression. All the elements in the hydro technical structures of water systems operate without consuming external energy, only natural water pressure, as a result of proper use of the local conditions and features of the natural landscape elements during the design and construction of the parks.
5. With the aim to preserve valuable landscapes, and protect and use them for aesthetic, educational and recreational purposes, historical parks motivate us to think about the modern possibilities for *sustainable and energy-independent hydro technical systems* in green territories. Today there is a modern project practice of an *integrated approach in architectural-landscape organization of streamside territories*.

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