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INTRODUCTION

The 12th edition of our collection of the research papers summarizes a wider research of foreign architects and landscape architects than the previous editions, representing the Netherlands, Lithuania, Portugal, Ukraine, Iran. Therefore, the spectrum of the research is very wide. An in-depth look is taken at the scientific methodology, studying the ecological, aesthetic, social aspects of the environment in the urban construction space. The methodology is more detailed in the context of memorial parks where the ideological moment, a strong emotional uplift, and the color of the national identity in the compositional structure of the landscape space dominate. The competence of the landscape architects and the psychological aspect - they are the criteria which play a very important role in the programs of higher education study and which are dealt with in depth in the research. Several authors touch the issues of identification and preservation of the cultural and the historical sites, particularly stressing creativity of the cultural landscape, the ecological concept, and the cultural and historical values of the urban construction landscape. In the publications, it is applied to the historical centers of cities with the research of compositional solutions of the monastery building ensembles. In contrast, the aesthetic quality criteria and the geopolitical conditions of modern building of the urban space are discussed in two studies - in the Riga and Tehran examples that vividly reflect the concerns of each urban space. For each region, it is its own specificity of the landscape space where the pulsation of the national identity is clearly readable - in the form, scale, harmony.

PRIEKŠVĀRDS

Mūsu zinātnisko rakstu krājuma 12. izdevums apkopo daudz plašāku ārvalstu arhitektu un ainavu arhitektu pētījumus nekā iepriekšējie izdevumi, pārstāvot Nīderlandi, Lietuvu, Portugāli, Ukrainu, Irānu. Tāpēc arī pētījumu spektrs ir ļoti plašs. Padziļināti ir aplūkota zinātniskā metodoloģija, pētot vides ekoloģiskos, estētiskos, sociālos aspektus pilsētbūvnieciskajā telpā. Detālāk metodoloģija ir skatīta memoriālo parku kontekstā, kur dominē ideoloģiskais moments, spēcīgs emocionālais kāpinājums un nacionālās identitātes nokrāsas ainavtelpas kompozicionālajā uzbūvē. Ainavu arhitektu kompetences specifika, profesionālais un psiholoģiskais aspekts - tie ir kritēriji, kas spēlē ļoti nozīmīgu lomu augstākās izglītības studiju programmās, un tiek padziļināti aplūkoti pētījumos. Vairāki autori ir pieskārušies kultūrvēsturisko objektu apzināšanas un saglabāšanas jautājumiem, īpaši akcentējot kultūrainavas kreativitāti, ekoloģisko konceptu un kultūrvēsturiskās vērtības pilsētbūvnieciskajā ainavā. Publikācijās tas ir attiecināts uz pilsētu vēsturiskajiem centriem ar klosteru apbūves ansambļu kompozicionālo risinājumu izpēti. Savukārt, mūsdienu pilsētvides apbūves estētiskās kvalitātes kritēriji un ģeopolitiskie apstākļi aplūkoti divos pētījumos - Rīgas un Teherānas piemēros, kas spilgti atspoguļo katras pilsēttelpas problemātiku. Katram reģionam tā ir sava ainavtelpas specifika, kurā ir skaidri nolasāma nacionālās identitātes pulsācija - formā, mērogā, harmonijā.

Aija Ziemeļniece
Editor in Chief

CONTENTS

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Methodological guidelines for optimizing the interaction between landscape architecture and urban planning

Vaiva Deveikienė, *Vilnius Gediminas Technical University*

Abstract. The article presents the results of research on optimization of interaction between natural and urban structures by applying the principles of landscape architecture. The research seeks to answer how landscape architecture can be beneficial in pursuit for the sustainable coexistence of nature and the city, what forms the creative field of landscape architecture in the urban environment and what determines the optimal expression of landscape architectural means in the urban landscape. The research is carried out in the city of Vilnius (Lithuania), but methods of the problem analysis and research can be easily adapted to other cities. The hypothesis of the research states that landscape architecture is an integral part of sustainable urban development and urban design paradigm, while applying the methods and principles of creation of landscape architecture, city's ecological, aesthetic and socio-functional needs are optimally matched and solved by combining them into a unified, sustainable three-member system operating in time and generating continuous natural and social processes. The article presents the conclusions of the research results concerning the factors determining the quality and specifics of interaction between landscape architecture and urbanism, in respect of optimal methods of interaction research, expression indicators and evaluation criteria.

Keywords: landscape architecture, interaction of natural and urban structures, ecological ethics, three-dimensional assessment system

Introduction

The global practice shows that cities, since the very beginning of establishment and in particular during their growth and expansion in the second half of the 19th century, not only addressed the construction tasks of streets and buildings but also sought for the actual relationship with nature, by adapting, mimicking it, embedding it into the urban fabric, creating deliberately to only improve the lives of people in the city.

The history of urbanism has been changing philosophers, theories, styles and priorities, and in this particular change we can see the development of landscape architecture, theoretical and practical virages, the growth of its role and new opportunities to contribute to the development of an urban landscape, in addressing the complex challenges of a sustainable green city. In the contemporary world of science and practice, the landscape architecture's area of expertise includes increasingly complex tasks related to the city management, renewal and development. City planners, urbanist and landscape researchers agree on a number of emerging interdisciplinary issues, as the city is a multifunctional organism undoubtedly having human well-being needs as its centrepiece. A new approach to landscape architecture and urbanization is demonstrated by the US researchers Ch. Waldheim, M. Mostafavi, J. Corner and others [22; 6; 30; 31] who created a new paradigm of landscape urbanism. The role and importance of landscape architecture in sustainable urban processes was studied by French scientists H. Soulier (2006); C. Abaut-de Chastene [1]; N. Bchir Jaber [2]; F.A Leger-Smith [14]. Application of the principles and methods of landscape architecture in architecture was demonstrated by D. Jauslin (2010) in his dissertation "Architecture with landscape methods" [13].

In Lithuania, the essence and significance of landscape architecture is not yet unanimously understood at theoretical level or in professional activities. Both the public and planning and design specialists have very different approaches to the competences of landscape architecture and the field of creative activities. There is a gap between landscape architecture and urbanism, and building architectural solutions, often failing to understand the role of cooperation, denying or ignoring each other. This exclusion problem begins at the level of urban planning and strategy setting and moves to the levels of block and object planning and design. Due to this gap, the issues of integration of the city's natural frame and green areas become problematic, deteriorating the quality of recreation and everyday environment, extenuating architectural solutions of engineering infrastructure and even social infrastructure.

The aim of the research is to create a methodological model for optimizing the interaction between landscape architecture and urbanism, based on sustainability principles. The problems of modern cities testify to the need to

strengthen the integration of landscape architecture and other urban processes, however, it is still not clear what determines the optimal interaction between landscape architecture and urbanism ideas, theories, activities and solutions, and how to achieve this synergy. The research seeks to substantiate or prove that landscape architecture is an integral part of sustainable urban development and part of the urban design paradigm, but the nature and extent of tasks assigned to it depends on the level of the managed territory, priorities and program. One of the hypotheses maintains that with proper presentation of landscape architecture in urban processes, priorities for landscape conservation and management are timely set, natural and anthropogenic resources are rationally preserved and optimally used and creatively adapted for the needs of people. Applying creative methods and principles of landscape architecture, the ecological, aesthetic and social needs of the city are optimally matched and addressed by combining them into a united, sustainable three-dimensional system that operates in time and generates ongoing natural and social processes.

The problem of research of the relation between the city and nature is inseparable from the problems of landscape research in general, related to such features of today's landscapes as rapid changes and their large scale, increasing complexity of landscapes, fragmentation both in the physical, visual, and ecological sense, and also due to the intersecting and not always visible social, cultural, economic and other interests [10]. In the 21st century, science is looking for ways to integrate the methods and conclusions of various fields of science, focusing in particular on the landscape and its management, as an alternative way and approach to addressing the issues of sustainable city, taking into account the abundance and integrity of the services provided by the landscape. Compared to other design and planning processes, landscape methods integrate environmental processes and identify beneficial synergies [23]. Lithuanian scientists speak in detail about the complexity of landscape research, arguing that the landscape is the area of interest of many sciences and professions. Landscape assessment and perception problems are addressed by philosophy, sociology, environmental psychology, geography, ecology, etc. Each field of science contributes to the landscape research with its own point of view and methods [35]. The aim of the article is to discuss the results of the research and to present conclusions.

Materials and Methods

The issues of aesthetic effects of landscape and its evaluation were studied, and a number of methods and criteria were proposed by scientists S. Kaplan [18], A. Stamps III [26]; A. Ode, M. S. Tveit and G. Fry [24]; A. Berleant [3]; D. J. Stobbelaar ir B. Pedroli [27]; A. Brink and D. Bruns [4]; R. van Etteger, I. H. Thompson ir V. Vicenzotti [9] and others. Landscape aesthetics and ecology issues were analyzed by J. I. Nassauer [23]; Latvian scholars M. Jankevica [11, 12]; M. Veinberga and D. Zigmunde [32]. However, most of the research is directed towards the landscape in the general sense, which is examined without reference to the landscape architecture, or only analysing the objects of landscape architecture, examining them separately in the ecological, aesthetic-ecological aspects. The social aspect is most often encountered in researching the problems of public spaces. The issue of compatibility of aesthetics, ecology and social aspects was raised by I. Thompson [29], treating it rather as an ethical problem and leaving the question of this compatibility between the three aspects open [29].

In our opinion, it is equally important to understand and appreciate the interaction between pure ecological functions and compositional structural elements that represent aesthetic categories, while the process of their optimal interaction is essentially a creative process of landscape architecture, with predefined methods and agreed criteria. The social criteria group is inevitably connected to the ecological and aesthetic criteria groups. The novelty of the research is determined by the fact that it analyses the interaction between natural and urban structures, where optimization possibilities are defined through the prism of the landscape architecture, and the research is carried out using a sustainability-based, three-member system of criteria, evaluating the interaction in the defined theories equally from the environmental, social and aesthetical aspects.

The main natural elements forming the city – the terrain; water bodies and vegetation – are analyzed in relation to the elements of perception of the urban structure – paths, nodes, edges, landmarks, districts, which are selected by adapting the method of K. Lynch [16], that has recently been increasingly used in the landscape architectural research [2]. In terms of landscape architecture, all five elements are important, but the edges, paths and nodes should be distinguished in particular. Edges essentially form spaces, providing them a contour, shape, and character; the path is an important compositional element organise involve the city life and cognition of landscape; nodes are well-arranged spaces concentrated in themselves, or the stepping stone for an overview of the surroundings.

The system of evaluation criteria was based on the methods of selective analysis of scientific literature and Delphi survey of experts. Statistical information and monitoring methods were used to

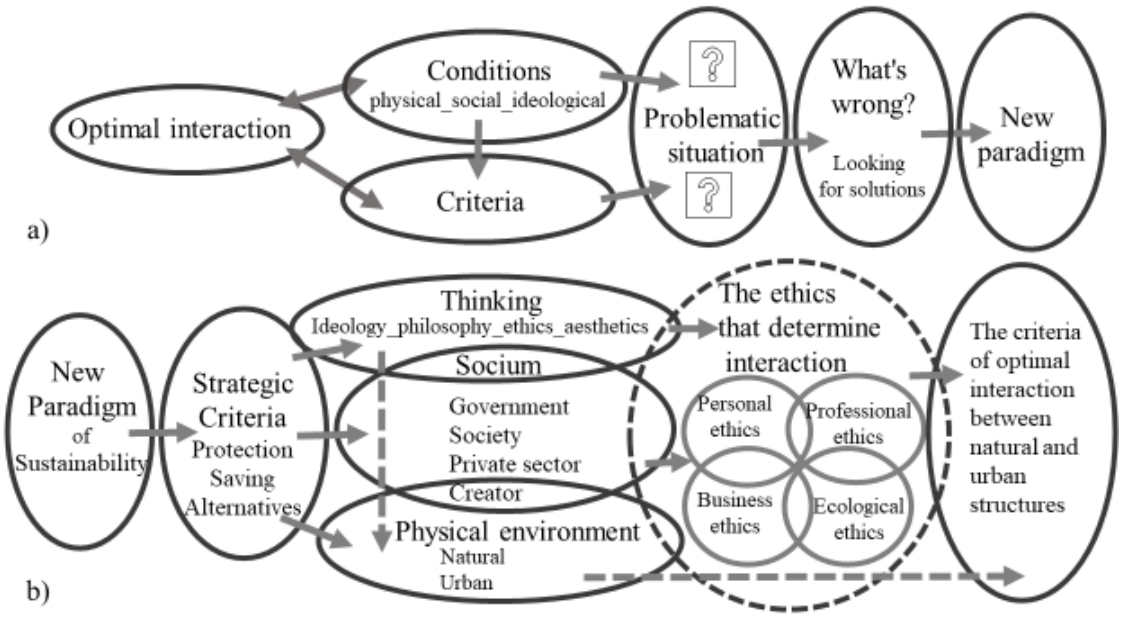


Fig. 1 a) Dependence of optimal interaction – principal diagram
b) formation of interaction optimization criteria – principal diagram

determine ecological and socio-functional values. The method aesthetical perception was chosen to determine the aesthetic values [18; 26]. The essence of this trine assessment is that each aspect of the assessment has the same number of criteria, since it is important to maintain the equivalence of all three aspects. The interaction of natural and urban structures is evaluated in separate clusters of criterions with scores from 1 to 5. The aforementioned assessment of the interaction of natural and urban structures of the territory is mainly carried out using a subjective expert assessment method. It allows to obtain evaluations of three criterion clusters that show the strengths (highest scores) and the weaknesses (lowest scores) of the territory. However, whereas territories are highly different in terms of natural and urban morphology, and social needs, it is obvious that criteria should be prioritized inside the clusters. To this end, the Multi Criteria Decision Making (MCDM) method is used, by evaluating the importance of criteria in pairs based on their significance in a particular territory, and establishing the weights of the criteria. Criteria priorities are generally established using one of the MCDM methods, the so-called Analytic Hierarchy Process (AHP), which is popular and successfully used in planning, environmental protection, in addressing climate change problems and other issues where it is necessary to decide on the priorities of many criteria [25]. By applying the AHP method, the priorities of criteria are determined by pairing them according to their importance in a specific territory. The hierarchy of criteria is determined in separate clusters of ecological, social and aesthetic aspects [15]. The quantitative (numerical) expression of the assessment results is necessary for the comparison of individual values and illustration of the territory problems, revealed by evaluating in different aspects. At the stage of analysis and synthesis of evaluation results and preparation of conclusions, we come back to the qualitative analysis methods, using the methods of multilayer analysis, processuality, space sequencing and context characteristic, characteristic of landscape architecture [19; 13]. The experimental research is based on the orthophoto photo and other GIS data with photos, by using the spatial grids method.

Basic principles for Methodological model

The main subject of the research is the interaction of natural and urban structures, interpreting it from the landscape architecture point of view. The work of the French sociologist and philosopher Edgar Morin on significance, expression and peculiarities of interaction has seemed acceptable to the author for this work. In his philosophical works, he analyses of the research subjects by combining for features of interaction operating in a close dynamic synergy – confrontation, supplementing, competition, collaboration. Interaction is understood as a basis of any system, because it includes the exchange of information, emotions or energy between two actors in one system [21]. Interaction between natural and urban structures occurs in various aspects and can be physical, visual, and psychological. It involves natural and man-made processes and is examined through the prism of urba-ecological and social needs and services. The research focuses specifically on the provocative interaction developed by human actions, which determines further processes and interactions. There are usually three main groups of people involved in urban processes in one or another process of interaction. These are the customer

TABLE 1

The scale of landscape management levels according to the pyramid of human needs [20, compiled by the author]

Human needs	**Environment from the point of view of landscape architecture**
REQUIREMENTS FOR SELF REALIZATION: spirituality, development, self-realization, raising personal goals and their implementation	**Ensuring environmental spirituality:** preservation and disclosure of the local spirit; preserving and fostering cultural landscape; creation of educational conditions; community self-expression opportunities; artistic expressions, aesthetic experiences.
NEEDS FOR RESPECT: self-esteem, independence, success, attention, recognition, social status	**Ensuring the quality of the environment:** tidy, comfortable environment; a variety of composite solutions that provide freedom of choice; public participation and respect for its opinions; optimal and cost-effective solutions; cost-effective and creative use of natural resources.
SOCIAL NEEDS: communication; societies; appearance; monitoring; cooperation, usefulness	**Assurance of socialization factors:** adaptation of territories for different age groups and various needs; integration of people with disabilities; accessibility and availability of recreational territories; ensuring of get-togethers and seclusion.
SECURITY AND WELFARE NEEDS: physical, emotional and material security; avoiding danger; health, child safety and education; sport; endurance training	**Assurance of safety factors:** physical safety of the environment; clean and healthy environment; health facilities; sufficient size of the recreational area; protection of natural resources; public and private interests.
PHYSIOLOGICAL NEEDS: air, food, physical comfort, sleep; hygiene; nutrition; shelter; movement	**Satisfaction of physiological needs:** clean air flows; light/shadow; sufficient moisture; noise protection; nutritional and expelling needs; satisfaction of leisure and activity needs.

(may be private or public), the creator (designer) and the public (user). Any of these three actors may be the first to "move" the process towards a new interaction. Ideally, all three groups understand and evaluate the situation, in which the new interactions occur, in a similar manner; in such case one can expect optimal decisions to be made (Fig. 1a and b). "Optimization" in dictionaries is defined as "finding the best way to solve a problem or task according to a predefined criterion". In the research, optimal interaction is understood as the result of human activity in finding the best solution according to predetermined criteria. The optimal interaction is characterized by the preservation of semantics, rational use of resources and elimination of repetition of excessive functions.

Thus, the most important question arises at this point – on what values will we base the optimality criteria for ourselves? Landscape architecture is very close to the environmental or ecological ethics in which we discover the same values as memory (*mémoire)*, heritage *(patrimoine)*, landscape identity *(l'identité de paysage)*, biodiversity *(biodiversité)*, solidarity *(solidarité)*, freedom and peace (*liberté et paix)*, well-being and better living *(mieux-être et mieux-vivre)* [8]. Ecological ethics also defines the principles of expediency and optimality: (1) protection of available natural and anthropogenic resources, safe and creative their use; (2) considering the context and creative adaptation; (3) synergy between social services (adequacy and complementarity of each other); (4) combining ecological, aesthetic and socio-functional issues into unified solutions. Sociologists studying consumption problems notice that consumption can be understood as unlimited desires and as necessary needs. The first case is the problem of a modern society. An unlimited desire to waste natural resources often turns into desire to dominate on the nature and manage it. And although, according to the philosopher A. Maceina, the control over nature does not interrupt human relations with nature, but binds them even more, but if there is no longer moral moment in this relationship, it becomes harmful both to nature and to human [28].

To analyse the landscape and the living environment, we adapted Maslow's pyramid of human needs and motivation [20], in which, according to the scale of needs, we interpreted the landscape management levels (Table 1). In practice, in examining any territory, one can look at the level of human needs in which our environment is. It is important to understand the consistency of this scale – until the foundation for the basic needs is created, there is no sense in the efforts for a higher level. It is precisely the ecological ethics and landscape architecture values and methods that allow to achieve consistent growth of the territory quality.

The logic of optimality claims that before we make any decisions about the development of the territory, we first need to make sure how it is special, what we have to preserving it and how to complement it. This means that it is first necessary to evaluate the chosen territory, to identify its strengths and weaknesses and, in the light of the evaluation results, to propose the optimal variants for further management. In order to ensure optimal solutions, we have: (1) to know very well the strengths and weaknesses of the territory in question; (2) to examine context opportunities and systemic links; (3) to analyse the needs according to the opportunities and threats provided by the situation

Fig. 2. Three-member system of assessment criteria based on the principles of sustainable ecological ethics [created by author]

and context; (4) to search for new solutions enriching the situation, through synergies; (5) to provide for possible natural and social processes in space and time, and to make sure that we do not create obstacles for them to go without interruption; (6) to set priorities for choosing the principles and tools for the territory management.

Three-dimensional system of criteria

The research has to answer the three main questions: (1) What resources do we have and how will we use them? (2) What needs are best met by the resources available and what services do we still lack? (3) What can landscape architecture principles and measures in assimilating and managing the territory offer? In accordance with the sustainability paradigm, ecological ethics and logic of optimality, a three-dimensional system of evaluation criteria, consisting of ecological, social and aesthetic criteria groups, is formed (Fig. 2). The three groups of criteria are drawn up in such a way that the results of the evaluation in one aspect provide information or raise the question to another aspect. For example, high results of ecological assessment can prompt socio-functional priorities and focus on specific compositional means for creating an aesthetic impact. The purpose of this assessment is to highlight the features of the territory – strengths and weaknesses, so that we can make decisions about how to strengthen the weak positions without weakening the strengths.

The main task and the guarantor of success of each assessment is the correct and universally chosen criteria. When evaluating from the **ecological** point of view, it is important for us to find out if there are natural structures in the territory that are treated as a very valuable and cherished property of the territory. Secondly, it is important to understand the level of biodiversity that surrounds us, so that we do not destroy it by irresponsible actions, but creatively integrate in our territory development plans. Thirdly, it is important to consider whether there are ecosystems created (or built up) in the territory that already have an independent life and are worthy of maintaining, nourishing or improving. Fourthly, it is necessary to clarify the capacity of both natural and created natural structures (in other words, green infrastructure) in relation to existing urban conditions. In this research, the following ecological aspect criteria recognised as important in scientific literature and other research, are used: naturalness (wildness), biodiversity, built ecosystems, and ecological carrying capacity.

Naturalness (wildness) is the most natural forms of natural preserved structures. For example, natural land surface areas, naturally growing trees, shrubs and herbaceous vegetation, naturally formed water bodies. The natural terrain in the research is understood as the earth's surface formed by natural processes, which is not substantially altered by anthropogenic processes. When assessing the naturalness of a water body, its nature is very important – stream, source, river, lake, sea, etc. **Biodiversity** – in this study, biodiversity of all types of vegetation is taken into consideration such as insects, birds, fish and other living creatures – they are predicted according to the principles of symbiosis – and their probability corresponds to the size of the habitat. The terrain is evaluated by how it is adapted to the disclosure of biodiversity. The biodiversity of the water body is assessed by the extent to which the surrounding vegetation creates opportunities for the expansion of the biodiversity. The score awarded is determined by the size of the territory with biodiversity in relation to the territory in question. **Built ecosystems** – green infrastructure based on innovative, sustainable engineering solutions. The terrain is evaluated depending on how it's management solutions take part in the storm water open management system; afforestation of roofs, terraces, decks; noise and air pollution abatement measures. In the assessment of water, consideration is given to whether open storm water management is provided for/implemented in the solutions; landscaped roofs as a means of storm water management; water ecosystem created; accumulated water – a watering tool. Also, the score is given to the territory where the water-conducting

TABLE 2

Criteria for aesthetic perception according to R. and S. Kaplan [18]

Criterion	Understanding type	Evaluation issue
Coherence	direct understanding	Do the images fit together? Is the structure and composition of the environment easy to perceive?
Complexity	direct exploration	Is it interesting to observe the environment? Is the variety of images big?
Legibility	inferred understanding	Is it easy to imagine a further path when walking forward and backward? Is it easy to orient in the environment?
Mystery	inferred exploration	How promising is the visible landscape if you go further? Are images that are still invisible causing curiosity?

coating ratio is 3/2 to the hard surfaces. **Ecological carrying capacity** – assessing whether natural and developed natural structures act as a system, and whether they interconnect. The extent to which natural structures are stable, namely, how much they are resistant to pollution or other physical effects, is considered. The level of integrity and perforation of natural structures is assessed – the more coherent the structure is, the greater its ecological carrying capacity. The potential for regeneration (and renewal) of natural resources (land, air, water, wildlife, vegetation) is assessed. An important indicator is also the ratio of built up and natural areas in the territory.

In the **social aspect**, the aim is to find out what social functions the territory values imply, which services should be included in the development plans of the territory, in order to make the best use of the available natural and anthropogenic resources and without compromising, create the services that are maximally tailored to the situation. For the social aspect assessment, a series of criteria corresponding to the human needs scale is formulated – accessibility, safety, social integration and participation, shared functions.

Accessibility is related to meeting the basic needs by ensuring basic physiological needs – pure air flow; the need for light and shadow; comfortable and sufficient moisture balance necessary for a person; noise protection, etc. When assessing the territory, it is important to make sure that there are at least minimum recreational conditions, whether paths are not closed and access to recreational resources is provided; whether the satisfaction of recreation and activity needs is guaranteed. It is assessed whether the movement trajectories are adapted to the terrain, or whether access to the highest points of sightseeing are ensured. It is also assessed whether access to the water body, movement along its coast, and visual contact are ensured. Accessibility is also assessed in terms of adaptation of territory for the disabled. The **safety** criterion relates primarily to the level of territory maintenance. It assesses both the physical and social safety of the environment and factors that can lead to security problems. Abandoned, disorderly territories with signs of antisocial activity are considered unsafe. Also unsafe are territories contaminated with chemicals, with polluted air and high noise territories. If there are abandoned buildings in the territory, it is also considered to be potentially unsafe. The safety parameters are reduced by blind facades and fences, hardly accessible nooks, pits, etc. The risk of the territory of becoming unsafe is greatly increased by heavy vehicle movement, limiting pedestrian flows and complicating safe movement. The **social integration and participation** criterion must first of all demonstrate whether the community is interested in its environment, or there are indications that people tend to take care of the environment altogether. The concept of social integration and participation suggests that public spaces must be adapted to different uses. When evaluating the territory, it is important to involve various stakeholders of the community, volunteering, co-farming, etc. When assessing the environment, we should consider whether there are conditions for self-expression of the community, the disclosure of local identity, the development of landmarks and points of attraction. The **shared function** criterion defines how closely they related functions fit together, to what extent they are adequate, and how much they can complement each other. It considers whether or not the services provided are synergic, do not duplicate or copy each other. One of the features of the function compatibility are integral engineering and composition solutions. Combined functions include building facades and entrances that are properly compatible in terms of the landscape architecture object, allowing the successful development of catering, cultural or recreational services in the territory of the park or other greenery.

The criteria for **aesthetic** aspect in scientific explorations and research are often considered together with the ecological social criteria, without distinguishing them into a separate group. Given the fact that a wide variety of composite tools are used in the formation of urban spaces and landscape which have a purpose of causing a variety of human

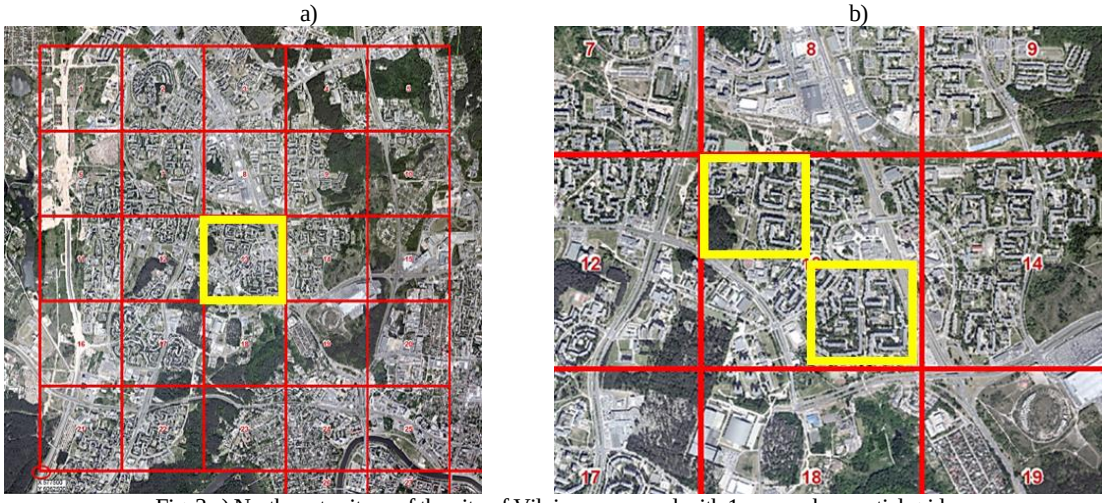


Fig. 3 a) Northern territory of the city of Vilnius as covered with 1 square. km spatial grid;
b) example of division to sub-grids (500 m x 500 m) [created by author]

reactions or emotions, we chose to evaluate the interaction of natural and urban structures using the aesthetic impact criteria. One of the most widely known environmental psychology theories was developed by the scientists Rachel and Stephen Kaplan [18; 26] research model – **mystery**, **complexity**, **legibility**, **coherence**. This theory relies on two basic human needs for the environment – to understand it and to explore it. In accordance with this principle, four main criteria for environmental emotional feeling or aesthetic feeling were distinguished. They are grouped by scientists into the groups of immediate understanding and immediate exploration, and inferred understanding and inferred exploration (Table 2).

The experimental research

For the research, the quarters located in the northern part of Vilnius, with main urban framework formed in around 1980-1990, but quite well developed at the present time, were chosen. The research area includes Pašilaičiai, Fabijoniškės, Šeškinė, Viršuliškės and other densely populated districts. The research focuses on the issues at the quarter level. The research analysed the interaction between the natural and urban structures of the territory, treating the latter as an important field of creative activity of the landscape architecture. In order to cover as many potential scenarios as possible in the expression of landscape architecture, we chose to explore not specific objects, but to examine the continuous problematic urban territory, covering it uniformly in a spacious grid.

The territory is uniformly covered with 1 sq. km grids, which corresponds to the division of the quarter level (Fig. 3 a). The method of this size of a standard grid is applied in European landscape monitoring systems and specialists recommend the transition to a unified landscape monitoring system in Lithuania [33]. There are 25 grids in total to analyse, covering a total territory of 25 square meters km. The analysis of 1 sq. km of the grids showed that quite different forms of interactions between urban and natural structures can be found in such size of grid. It was decided that territorial units of research should be broken down to a smaller unit – sub-grids of 500 m x 500 m, where the characteristic features of the physical interaction of urban and natural elements appear to be the best (Fig. 3 b).

A total of 100 surveyed territorial units were developed for the research. Their primary analysis showed that features of interaction between natural and urban structures in separate grids have commonalities that can be grouped together, in order to distinguish certain types of physical interactions. In the current stage of a specific research, no detailed morphological analysis of urban landscape is performed, but in principle, distribution according to the characteristic features of physical interaction of natural and urban structures close to it allows development and interpretation of results also from the morphological viewpoint in subsequent stages of research. Fig. 4 shows the distribution of sub-grids of the northern territory of the city of Vilnius (500 m x 500 m) according to the predominant features of physical interaction.

Relevant research in assessing the peculiarities of interactions between natural and urban structures was carried out in different grids (500 m x 500 m). For the objectivity purposes, the grid was chosen randomly for the research, according to the "biopsy" principle, as this random arrangement of the monitoring benchmarks in most scientific works is recognized as the most appropriate [33]. We present an example of grid 13.4 (Fig. 5). The territory in question is located in Šeškinė district, built in about 1980. It is dominated by preplanning apartment buildings of 5 to 9 storeys of reinforced concrete blocks featuring long facades, arranging the

Fig. 4. Breakdown by the dominant features of physical interaction of natural and urban structures in separate grids: A – dominated by open spaces of apartment buildings; B – dominated by transport infrastructure; C – dominated by forest areas; D – urban deserts; E – dominated by homestead buildings; F – dominated by water bodies [created by the author]

Fig. 5. The spatial grid (13.4) of 500 m x 500 m was used for the research [created by the author]

TABLE 3

Example of expert assessment of interaction between natural and urban structures (ecological criteria cluster) [created by the author]

13.4	Paths				Edges				Nodes				Landmarks				Districts				Total
	Naturalness	Biodiversity	Built ecosystems	Ekological capacity	Naturalness	Biodiversity	Built ecosystems	Ekological capacity	Naturalness	Biodiversity	Built ecosystems	Ekological capacity	Naturalness	Biodiversity	Built ecosystems	Ekological capacity	Naturalness	Biodiversity	Built ecosystems	Ekological capacity	
Soil	2	2	1	1	3	3	2	1	2	2	1	1	2	2	1	1	2	2	1	1	33
Water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Plants	3	3	2	1	3	3	3	2	3	2	2	1	2	2	1	1	3	3	2	1	43
Total	5	5	3	2	6	6	5	3	5	4	3	2	4	4	2	2	5	5	4	2	77
	15				20				14				12				15				

buildings in the shape of the letter L and creating semi-enclosed courtyard spaces. The spatial grid in question has two pre-school institutions with sufficiently spacious enclosed territories. The buildings are mirror-situated on both sides of the pedestrian walkway in the north-south direction. The terrain is less expressive and has a common north-south slope. According to the dominant features of physical interactions of natural and urban structures, the grid in question is classified as the type "Internal open spaces of apartment buildings".

The interaction of natural and urban structures is evaluated in separate clusters of the three-criterion system, by signing points from 1 to 5, where 1 point is very weakly expressed; 2 – weakly expressed; 3 – average; 4 – strongly expressed; 5 – very strongly expressed interaction. If some element of the natural structure is missing – we write zero (Table 3).

Results and Discussion

By adapting the method of subjective expert assessment, the assessments of the interaction between the natural and urban structures of the territory obtained are quite similar to each other – 77, 74, 76 points, respectively. This shows that the territory does not have highly unique interaction properties, and the level of interaction is rather low – the score obtained for each of the positions is below 30% of the possible score (the maximum possible amount is 300 points). The summarized results of the interaction of the natural and urban structures of the territory under consideration are presented in Table 4.

The strengths and weaknesses of the territory are determined during the analysis of evaluation results – they are distinguished by comparing data with each other. For example, in all three groups of criteria, plants (40-43 points) are in more active interaction with urban structures than terrains (30-34 points). Both the plant and the terrain expression is the strongest in the boundaries, in terms of ecological and aesthetic aspects. The least interaction of natural and urban elements is expressed in the formation of landmarks. The results of the interaction evaluation are analyzed in more detail in the criteria groups or clusters, where a maximum score of 75 is possible for each of the sub-criteria. The results of evaluation of grid 13.4 in question are presented in Fig. 6, reflecting the evaluation scores obtained and their relationship with the possible maximum score. The highest scores were given to "naturalness" (25) for ecological aspect and "cohesion" (25) for assessing from the aesthetic aspect. Accordingly, the second place are assessments by the sub-criteria "biodiversity" and "legibility", each scoring 24 points. The "ecological carrying capacity" (11) and the "mystery" of the territorial got the lowest score (11). Evaluations between the sub-criteria of the social aspect cluster are distributed more evenly, by signing a slightly higher score, with the highest score by sub-criteria "inclusion" and "accessibility" (Fig. 6).

TABLE 4
Summarised results of evaluation of the interaction of natural and urban structures in grid 13.4.
[created by the author]

Cluster of criteria	Ecological aspect				Social aspect				Aesthetic aspect				**Total**
Object of interaction	Ground relief	Water	Vegetation	Subtotal	Ground relief	Water	Vegetation	Subtotal	Ground relief	Water	Vegetation	Subtotal	
Paths	6	0	9	15	8	0	8	16	6	0	9	15	**46**
Edges	9	0	11	20	7	0	9	16	9	0	11	20	**56**
Nodes	6	0	8	14	7	0	8	15	6	0	8	14	**43**
Landmarks	6	0	6	12	6	0	6	12	6	0	6	12	**36**
Districts	6	1	9	16	6	0	9	15	6	0	9	15	**46**
Total	33	1	43	**77**	34	0	40	**74**	33	0	43	**76**	**227**

The interpretation of the evaluation results carried out by the subjective expert research method, based on the three-dimensional criteria system, highlights the features of natural and urban structures taking place in the territory – relatively stronger and weaker sides of this interaction (Table 5). Relatively higher score of natural biodiversity is attributable to the fact that the plantations growing in the territory are mainly native species, thus contributing to the formation of the natural environment, as well as to a certain level of biodiversity, which is somewhat random, and establishing due to modest mechanical and chemical maintenance of plantations, thus involuntary creating conditions for the development of natural communities, albeit small. Both ecologically and socially, the plantations are best revealed in the interaction with boundaries – mostly in the yards of apartment buildings, along the paths and the fences of preschool education institutions. They are also pronounced in the paths, which explains the relatively distinct "accessibility" score, which is given by assessing the population's ability to easily access natural structures and use their services. Aesthetically, the most significant interaction is within the boundaries of plantations, especially in terms of the criterion of coherence, because in uniformly planned urban spaces the relation between plantations, terrains and buildings is clearly perceived at the pedestrian paths. According to the research results, one of the weaknesses of the territory is that it does not contain any natural or artificial water body. The ecological carrying capacity of the territory is weak because natural structures are "overloaded and interrupted" by the

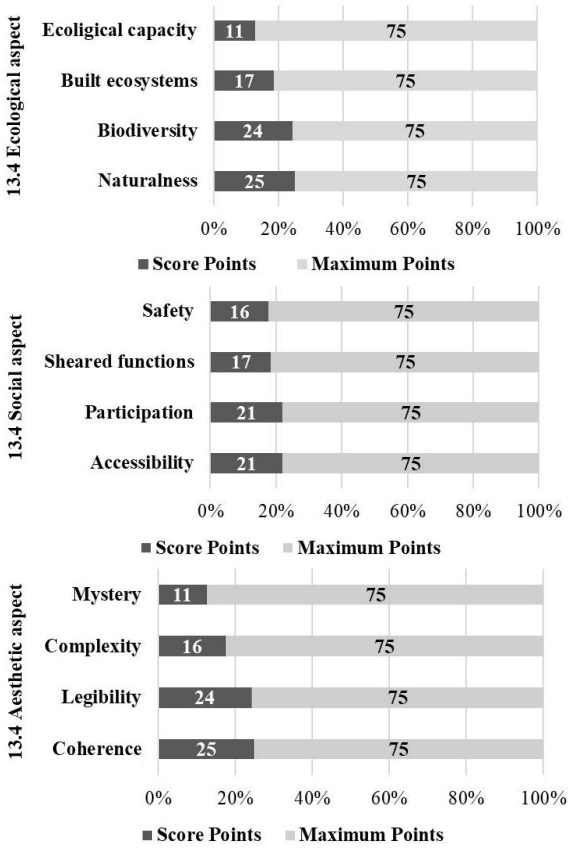


Fig. 6. Relative values of interaction between natural and urban structures (grid 13.4) [created by the author]

buildings and hard pavements. Natural structures, especially herbaceous plants, are unable to recover due to their constant mechanical damage and loads. There are few ecosystems in the territory that would interconnect and strengthen the green infrastructure of the quarter. The territory is considered unsafe because of chaotic parking of cars, worn out walkways and recreational areas, randomly formed nooks are to be seen as the attributes of the unsafe environment. The analyzed environment is formed by poor compositional means, therefore, there is no abundance and mystery in terms of emotional effect, the environment is not intriguing, it is not interesting to observe it.

During the analysis of the method of subjective expert assessment, the question of "how strongly the interaction between natural and urban structures in a given territory is expressed in terms of a unified system of criteria?" was investigated, and the results of evaluation show the relative distribution of values between the sub-criteria in the individual clusters of three-member criteria system. Regardless that the evaluation results are interpreted by highlighting the strengths and weaknesses of the interaction between natural and urban structures, the problem of objectivised prioritisation remains; it is solved by using the method of multi-criteria analysis and raising the question "which sub-criterion of the separate cluster of criteria is more important in a specific territory?". We present an example of how, by applying the analytical hierarchy process (AHP) method, the priorities of criteria are determined by evaluating them in pairs according to their significance in a particular grid 13.4. The significance of the criterion in respect of each other for evaluating the scores from 1 to 9. The calculation was performed using the AHP-OS free internet access priority spreadsheet (https://bpmsg.com/academic/ahp.php). The prioritization process is illustrated in Table 6.

By applying the multi-criteria analysis method, the priority ranking of sub-criteria in separate criterion clusters is determined (Table 7). In the cluster of ecological criteria, the importance of ecological carrying capacity and the created ecosystems comes first, with three positions remaining important socially – accessibility, safety and integration, respectively. From the aesthetic point of view, priority is given to the coherence and legibility sub-criteria.

Comparing the results of the assessment of the current situation in scores, and the preferred priorities (Table 8) set by the multi-criteria analysis, specific problem issues of clusters of interaction between natural and urban structures you might in specific clusters of criteria. From the ecological point of view, the strength of the territory in question – naturalness by priorities scale – is least significant, and the weakness – ecological carrying capacity – is one of the most important preferred priorities. In the cluster of social criteria, the strength is accessibility, and this criterion remains crucial in prioritising. The second priority is the safety priority, however, assessment according to it has received the lowest score in assessing the current situation. In the cluster of aesthetic criteria, the priority criteria included coherence and legibility, according to which, during the evaluation of the expert situation, the interaction between natural and urban structures was evaluated with relatively high scores. In search of the solution methods for optimum interaction between natural and urban structures, it is necessary to consider the features and priorities determined during the assessment of the territory. It means that we must establish the optimum priority criteria based on the ratio between valuable weak properties and preferred priorities. The score awarded during the expert assessment by criteria (RS) is multiplied by the percentage value of the preferred priority and a new relative numeric value is obtained, which represents the real importance of the priority criterion, in the light of the available valuable resources of the territory and their shortage inside of the cluster of criteria.

The list of reasonable criteria based on the analysis of the current situation is the main form of

TABLE 6

Prioritization process using the AHP-OS free internet access spreadsheet:
a) ecological aspect; b) social aspect; c) aesthetic aspect [created by the author]

a)

Subriteria of ecological cluster 13.4	Naturalness	Biodiversity	Built ecosystems	Ecological capacity
Naturalness	1	0.5	0,2	0.11
Biodiversity	2	1	0.5	0.5
Built ecosystems	5	2	1	1
Ecological capacity	9	2	1	1

b)

Subriteria of social cluster 13.4	Accessibility	Participation	Safety	Sheared functions
Accessibility	1	2	1	7
Participation	0.5	1	1	3
Safety	1	1	1	6
Sheared functions	0.14	0.3	0.2	1

c)

Subriteria of aesthetic cluster 13.4	Coherence	Legibility	Complexity	Mystery
Coherence	1	1	8	4
Legibility	1	1	5	5
Complexity	0.12	0.2	1	1
Mystery	0.25	0.2	1	1

TABLE 7

Priority ranking of sub-criteria in separate criterion clusters [created by the author]

Ecological aspect	Priority	Rank
1. Naturalness	6.50%	4
2. Biodiversity	16.80%	3
3. Built ecosystems	35.10%	2
4. Ecological capacity	41.60%	1

Social aspect	Priority	Rank
1. Accessibility	39.10%	1
2. Participation	22.80%	3
3. Safety	32.00%	2
4. Sheared functions	6.00%	4

Aesthetic aspect	Priority	Rank
1. Coherence	43. 70%	1
2. Legibility	40.40%	2
3. Complexity	7.30%	4
4. Mystery	8.60%	3

TABLE 8

Analysis of the relation of values and priority criteria for expert scoring of the territory.
RS – awarded rating score; PC – priority criteria; OP – optimal priority [created by the author]

Cluster I				**Cluster II**				**Cluster III**			
Ecological criteria	RS	PC	OP	**Social criteria**	RS	PC	OP	**Aesthetic criteria**	RS	PC	OP
Naturalness	25	0,065	1,63	Accessibility	21	0,391	8,21	Coherence	25	0,437	10,93
Biodiversity	24	0,168	4,02	Participation	21	0,228	4,79	Legibility	24	0,407	9,7
Built ecosystems	17	0,351	5,97	Safety	16	0,328	5,12	Complexity	16	0,073	1,17
Ecological capacity	11	0,416	4,58	Sheared functions	17	0,06	1,2	Mystery	11	0,086	0,95

the tasks in the territory's management. For example, in order to optimize the interaction between natural and urban structures in the territory of grid 13.4, it is essential to create new ecosystems and ensure the ecological capacity of the territory and promote its biodiversity. In social terms, it is most important to ensure the accessibility and safety, as well as to seek higher participation of the public. From the aesthetic point of view, the consistency of the composition and readability are most important.

The approaches of anamnesis (multilayer analysis), process, space sequencing, and context are used in landscape architecture making it possible to address all the priority tasks simultaneously, by combining solutions into a single whole [19; 13]. **Anamnesis** is the accumulation and analysis of information from different timelines, approaching to the present state of the landscape, when historical factors are integrated into the existing landscape from the natural to the artificial nature, including the spiritual and symbolic levels of society. All types of landscapes are seen as different layers of palimpsest – natural, cultural, infrastructural or developed with buildings. The **process** method creates the dynamics of natural and induced landscape changes. The process of site development in some direction is determined by the effect of nature and time as well as the design strategy. The creative process involves observation, protection and management of social and ecological systems. The landscape architect is structuring the potential landscape, knowing perfectly that his work will never be completed as a building. **Spatial sequencing**, or in other words, determining the sequence of spaces when one space complements the other, prepares for new impressions in the other space. Spatial consistency is a very important landscape design method. Spatial properties of the landscape are very dynamic and are fundamentally different from the static spatial properties characteristic to the building architecture.

TABLE 9

The role of participants in the interaction process in the principles of landscape architecture in implementing the priority tasks. The four main methods of landscape architecture are marked with A – anamnesis; P – process; S – spatial sequencing; C – context [created by the author]

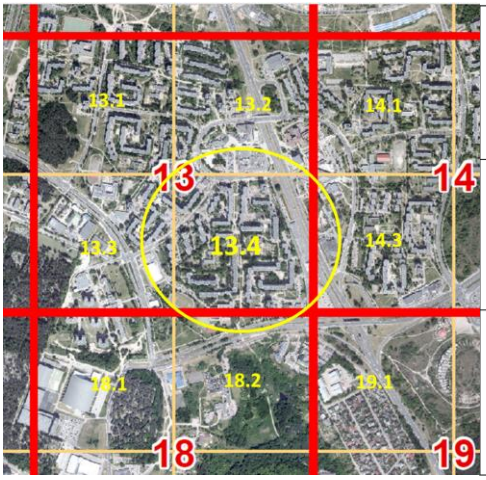
Priority criteria	Optimal priority score	The actors of interaction				
		Privat person	Society	Authority	Business	Professionals
Coherence	10.93	S	ASC	APC	SC	APSC
Legibility	9.3	S	ASC	ASC	SC	APSC
Accessibility	8.21	P	PC	APC	PSC	APSC
Built ecosystems	5.97	PS	PC	APC	APC	APSC
Safety	5.12	PS	PSC	PS	PSC	APSC
Participation	4.79	P	PSC	PC	PC	APSC
Ecological capacity	4.58	P	PC	APC	PC	APSC
Biodiversity	4.02	P	P	AP	P	APSC

Areas such as topography (terrain), movement and horizon, and imagery relate to spatial sequencing. **Context** is an important and exclusive method of landscape architecture. The landscape design creates a context, and not only responds to it. Context creation consists of intensive relations of the function, image and space and their versatile combinations, by combining individual elements into a single composition. Landscape architecture is characterized by the feature to create a program from the landscape shape and context. The context principle obliges to look further beyond the boundaries defined for a project or analysis

The solution of priority tasks also requires a complex approach and a synergistic link between the interaction of the participants of the optimisation process of various natural and urbanist structures which, based on the nature of the operation, can be divided into five groups: private individuals, society/community, various levels of government, business enterprises and their representatives, and professional designers. Their joint action is conditioned by a unified approach to human relations with nature, evaluating their actions from the point of view of good and evil and formulating their behavioural principles in accordance with these categories [17]. As noted by I. Thompson, analysing ecological, aesthetic, social issues in landscape architecture, environmental management solutions are closely related to the use of land and its ownership, with the privileged lifestyle and willingness or unwillingness to change it [29]. Environmental or eco-ethics can help to find a common language in defining the key principles for the landscaping management. The ethical whole defining the interaction of natural and urban structures is formed by the ethics of each of the process participants – personal ethics, business ethics, professional ethics and ecological ethics. Each participant of the process influences whether the principles and methods of landscape architecture will be used timely and fully utilized to solve the real route challenges of the territory. The participation of the participants in the process of interaction between natural and urban structures in the implementation of the priority tasks, using the four main methods of landscape architecture, is presented in Table 9.

The results of the research show that in assessing the territory in all aspects, it is necessary to consider not only a specific plot or a defined area, but also to analyse the situation in adjacent territories, noting the areas not smaller than the area under consideration (Fig. 7). For example, in our research, we selected a conditional 500 m x 500 m grid; in order to achieve the accuracy of the evaluation of this grid, it is necessary to examine the same size of the surrounding grids, in the specific case – 1500m x 1500 m. Adequate expansion of the field of analysis is useful because both natural and social processes are not limited to legal or conditional boundaries. For example, there are no natural structures (forest, water, etc.) in the territory in question, but they are in the adjacent territory (or grid). Thus, by creating the ecosystems of our territory, we can (or perhaps we must) join to the existing large ecosystems. In social terms, we might ensure the connection of inhabitants of our territory with the common plantation system, and from the aesthetic point of view, the images of adjacent territories could be integrated into the landscape created by it. Fig. 7 shows the aggregated data of the grid 13.4 and its adjacent grids, which reflect the rating scores awarded (AS) during the assessment and the relative values (RV) obtained by comparing awarded rating score to the maximum score.

According to James Corner, based on the landscape architecture methods, in the managed area processes over time, mutual natural and social processes are created; all surfaces are creatively



Ecological AS=92 RV=0,3 Social AS=76 RV=0,25 Aesthetic AS=131 RV= 0,43	Ecological AS=34 RV=0,11 Social AS=73 RV=0,24 Aesthetic AS=79 RV=0,26	Ecological AS=56 RV=0,18 Social AS=62 RV=0,2 Aesthetic AS=78 RV=0,26
Ecological AS=31 RV=0,1 Social AS=78 RV=0,26 Aesthetic AS=123 RV=0,41	Ecological AS=77 RV=0,26 Social AS=75 RV=0,25 Aesthetic AS=76 RV=0.25	Ecological AS=53 RV=0,17 Social AS=54 RV=0,18 Aesthetic AS=75 RV=0,25
Ecological AS=106 RV=0,35 Social AS=125 RV=0,41 Aesthetic AS=111 RV=0,37	Ecological AS=174 RV=0,58 Social AS=111 RV=0,37 Aesthetic AS=78 RV=0,26	Ecological AS=35 RV=0,12 Social AS=54 RV=0,18 Aesthetic AS=75 RV=0,25

Fig. 7. Data of grid 13.4 in question and its adjacencies [created by the author]

arranged and staged; operational or working methods are offered for the participants of the interaction process; the imaginary emotionally attractive environment is created [5]. The study interprets the Jill Desimini's landscape management categories –community open spaces; ecological landscapes; blue-green infrastructure; working-productive landscapes; transitional landscapes [7]. These categories are classified into separate grids according to their optimal priority needs, giving the territory a general direction in landscape management.

Conclusions

Natural and urban structures form the integral fabric of the city, and their interaction depends on the ethical attitudes of the urban process participants – the private person, the public, authorities, business enterprises and professional designers, their mutual understanding and collaboration. In the context of the challenges of today's world, the optimal interaction of natural and urban structures is conditioned by the concept of a sustainable city, which is achieved through ecological ethics.

Landscape architecture is an exclusive discipline that generates designer competencies that allow them to take on the tasks of rational and creative integration of natural and urban processes, both in the stages of city strategy development, and planning and design stages. Using the methods and principles of landscape architecture in urban management, one can expect optimal results of interaction between natural and urban structures.

The paradigm of sustainable urban development encourages the use of natural and anthropogenic resources in a cost-effective and reasonable manner, therefore, before engaging in the tasks of urban territory management, it is necessary to have a comprehensive knowledge about the properties of the territory in question and its context.

By using a three-member territorial assessment system consisting of three separate clusters of ecological, social and aesthetic criteria, the site-specific values and problem properties are determined – the strong and weak characteristics of the existing condition.

By applying the multi-criteria analysis method, the priorities of the preferred criteria are identified and compared with the results of the assessment of the current state of the territory. The ratio of the assessment score of the territory according to the criteria with the weight of the preferred criterion identified by the analytical hierarchy process method indicates the optimal value of the priority criterion, based on the compatibility of the existing natural and urban characteristics of the territory and the established priorities. This determines the optimal sequence of the priority criteria.

By applying the four main approaches to landscape architecture, a new approach to urban management and development priorities is created. Natural and urban structures are consistently interconnected to systems that generate synergistic processes involving all participants in the interaction process. New ecosystems are integrated into the existing ecological system, preserving the key links and strengthening the ecological capacity of the territory. The same ecosystems serve the social needs of people – ensuring the accessibility and security of green areas, creating spaces for self-expression of the public. The coherent composition of spaces and the integration of context creates a sense of harmony and strengthens the readability and perception of the territory, and enhance the local identity.

The method of spatial grid implies a contextual approach to the territory under consideration. Splitting the territory into defined territorial units highlights the characteristic features of physical and social interaction of natural and urban structures.

The specificity characteristic to the grid is compared to the characteristics of the adjacent grids, looking for the necessary ecological, social and aesthetic interfaces. The grid's method reflects the principle of design – from the whole to the detail, from the detail to the whole. This method encourages the territory to be examined through the landscape prism, going beyond the boundaries of the parcel. It is recommended to associate the problem of interaction between natural and urban structures and solutions of the territory management with neighbourhoods located around in the grids of the same size.

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Kopsavilkums. Pētījums veikts Lietuvā, Viļņas pilsētā par dabas pamatnes un pilsētvides savstarpējo mijiedarbību un ainavu arhitektūras principiem, kas spēj nodrošināt kvalitatīvu pilsētvidi. Raksts ietver analīzi par ilgtspējīgas pilsētas attīstību, kur piemērojot atbilstošas metodes un principus, tiek pētītas pilsētas ekoloģiskās, estētiskās un sociāli funkcionālās vajadzības, savstarpēji optimāli saskaņojot tās un izvērtēti dažādi pētījumā izvirzītie kritēriji. Rakstā apkopoti pētījumā iegūtie rezultāti, kas nosaka ainavu arhitektūras un pilsētvides mijiedarbības kvalitāti un specifiku, attiecībā uz optimālajām mijiedarbības pētīšanas metodēm, izteiksmes rādītājiem un vērtēšanas kritērijiem.

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Theoretical and methodological principles of memorial parks three-dimensional composition and ideological lines expressing means complex assessment

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Abstract. One of the aspects of the preservation of memorial parks as objects of cultural heritage, in the context of the formation of scientifically grounded approaches to the reconstruction of their territory, is the assessment of the present state of both the material components of the park space, and the features of the symbolism usage and means of expressing of their ideological load. On the basis of analysis of available techniques for evaluating individual components of the park space, the main aspect is the assessment of exclusively material elements of the park space – their qualitative, aesthetic and quantitative characteristics, and there is no differentiated approach to the evaluation in accordance with the functional features of the parks that limit the significance of one or another criteria. In addition, while using existing evaluation methods, symbols, ideologies, thematic orientation of the park, the stylistic unity of the composition, as well as the colour of park landscapes, which is an important means of highlighting its thematic orientation and its separate functional zones, evaluation of which in the park area is fragmentary in nature, remain out of focus. According to the results of the analysis of scientific sources of literature and researches of the Kyiv's memorial parks during 2011-2017, the newest methods for assessing the cultural and historical value and means of expressing the ideological load of memorial parks were developed, which include a system of criteria that characterizes both the common features, and the state of the components of the park space at the present stage are also the basis for forming directions for its further rational use.

Keywords: memorial park, ideological load, symbolics, assessment, functional colouring

Introduction

Parks during their history have been the synthesis of different arts and now they are centers of cultural and historic heritage of the country. The forms and content of gardens and parks has been changing along with the developing of society needs, which conditioned the transformation of the park space components. An important step of the park research is to analyze its formation and development characteristics and transformation of the territory during the whole period of their existence and the effects of these transformations. These are the keys for formation of optimal methods of park reconstruction and adaptation to modern conditions and promotion of conservation of valuable components of the park space.

Memorial complexes, as elements of urban environment, have a special general cultural significance that provides a connection with the past of the state, because they most fully illustrate the ideology through park space elements. Expression of the ideological load of memorial park due to composition elements, principles, and park landscape components, which are the base of park three-dimensional structure. At the same time, the transformational processes that are caused by park landscape development as a biological object irrevocably take place throughout the history of its existence.

The approaches and methods of park environment assessment have been highlighted in the works of a number of scientists, in particular: the aesthetic characteristics of landscapes and some components of park space were studied by Hrynasiuk [8], Hrozdynskyi & Savytska [7], Kurdiuk [13], the subjective perception of park landscapes by Kaplan & Kaplan [11], Kane [10], Forster [4], Kaymaz [12], Van Etteger et al. [23]. The functional approach to park space assessment is covered in the works of Oleksiichenko & Gatalska [17], Oleksiichenko & Mavko [21] and the conceptual scheme of the formation stages of the research program of the park environment aesthetics and their relationship was proposed (Oleksiichenko & Gatalska [19]).

The problem of memorial park design was investigated by many scientists: Luntc [15], Likhachev [14], Bogovaia [2], Sokolskaia [22], Folkert [3], Janković [9], et al. However, we can hardly find complex scientifically based methodological thesis about the memorial parks research with considering on their peculiarities (in particular, the memorial function

and cultural-historical significance) which would provide objective assessment of the current state and preservation level of parks and would be grounds for determination of optimal directions of their reconstruction for the purpose of rational management today.

Based on the analysis of both general and specific scientific approaches and methods of park environment assessment, it was revealed that, along with a large number of them, the analytical studies of symbolic-ideological and thematic orientation of the park, stylistic unity with composition elements and principles, and park landscape colouring remain outside the attention of the scientists.

The purpose of the research is to improve the park space assessment theoretical and methodological principles, in particular: to develop and substantiate theoretical innovation of complex approach to memorial park assessment and approbation of developed method during the Kyiv memorial parks assessment.

Materials and Methods

Four memorial parks of Kyiv are the objects of our research, in particular: the ones dedicated to famous figures (T. Shevchenko Park and M. Rylsky Park in Holosiivo) and to war themes (Peremoha Park and Slavy Park). The results of complex surveys of their territory conducted during 2011-2017 became the actual materials for research. For the study we used general and specific scientific methods which were based on the environmental approach (natural surveys) and models using (graph-analytic studies, photophixation and photo analysis), historical information about the formation and development of parks were based on scientific literature sources and archival materials.

Results

According to scientific literature review and personal analysis of our researches of Kyiv memorial parks that were conducted during 2011-2017, the method of memorial park complex assessment was developed. It includes assessment of an object according to the following criteria divided into three groups. *The first group* includes the following criteria: availability of written information of formation and development of parks; the significance in the urban structure of settlement; the principle of placement in the urban structure of settlement.

Focusing on the substantiation of criteria separately as well as the results of parks assessment according to them, it is reasonable to begin with the availability of written information about the research objects in historical context. The materials that are needed for assessment according to the first criterion are: materials of historical project documentation, historical and archival materials (especially inventory information of different historical periods, with results of plant species diversity assessment which give a possibility to assess scientific, cultural and historical significance of park) and results of scientific literature analysis, and especially periodicals, which provide information about the significant events that took place on park territory, visits by prominent figures, memorable tree-planting etc.

The availability of written information of formation and development of parks criterion is scored the following way:

1 point – fragmentary data in the sources of information that are indirectly related to the object;

2 points – separate descriptive data in official sources of information on the time of creation, general features of the planning and three-dimentional composition;

3 points – reliable descriptive data in the official sources of information above, as well as on development stages, designers, individual data on the composition of plants and other components of the park space;

4 points – comprehensive information provided by the previous criterion, as well as the availability of iconographic and cartographic materials of individual periods of development of the object, as well as data on the reconstruction (if any);

5 points – availability of reliable data (descriptive, cartographic, iconographic) for all stages of object development in various sources of information (scientific sources of literature, archival, project, etc.).

Assessment of the significance of memorial parks in the town-planning structure of the settlement (placement in settlement system and hierarchical level of urban-planning organization), scale, architectural and planning characteristics is important in the context of the overall development of the urban structure, which is in a constant transformation. At the same time, it is important to determine the historically formed image of the urban environment and the components that characterize it. The justification for the assessment based on this criterion is based on the classification of memorial objects by Sokolskaia [22]. The importance of this assessment is also highlighted by Janković [9].

The significance of memorial object in the urban structure of settlement criterion is estimated as follows:

1 point – the object covers a local area in a city, a populated area or in an interplastic area, which is not related to historical events, the memorial is dedicated to;

2 points – the property is located on the site of historical events, dedicated to, but has a small size

and does not imply a general planning organization, of the area where it is located;

3 points – the object is an architectural or sculptural ensemble, occupies a certain territory, affects the planning organization of the administrative part of the settlement;

4 points – the object is a memorial-park or museum-memorial ensemble with a well-developed planning structure in the city or in the inter-peasant territory, which has a significant effect on the territory of the district in which it is located;

5 points – the object is a memorial-park, memorial-forest park or museum-memorial complex, which not only affects the planning and three-dimentional structure of the location, but defines it, subordinating the surrounding components of space.

A glaring example of the memorial and park complex is the "Slava" park in Kyiv, which according to this criterion is rated the highest point. The location of the object is not related to the historical events that it highlights, since its historical significance is not limited with the administrative districts of Kiev, but is connected with the history of the entire state, which is why the location in the city structure was chosen to emphasize the historical significance of the object. The highest score according to this criterion is Goloseevsky park named after M. Rylsky – occupies a considerable area – 140,9 hectares and significantly influences the planning structure of Goloseevsky district.

A score of 4 points is given to Peremoha Park and to the park named after T. Shevchenko, whose influence on the urban environment is less than the above-mentioned objects. They are both memorial-park ensembles with a well-developed planning structure, which determines a significant influence on the territory of the district of its location.

The principle of placing in the structure of the settlement is an important classification mark, as well as a description of the memorial object, which corresponds or does not correspond to the historical events related to it. According to this criterion, it is possible to determine the expediency of placing an object in place and directions of further functioning. The theoretical basis for the formation of this criterion was the work of Lunts [15] and Sokolskaia[22].

Thus, the principle of placement in the urban structure of settlement criterion is scored the following way:

1 point – the object is located on the territory with which it is not connected, violates the integrity of the three-dimentional structure of the park territory;

2 points – the object is located in the territory with which it is not connected, but does not violate the compositional and ideological integrity of the territory it is located in;

3 points – the object is located in accordance with the town-planning principle of the placement of a memorial object;

4 points – the object is located in accordance with the historical documentary principle of the location of the memorial object;

5 points – the property is located in accordance with historical, documentary and town-planning principles.

An example of an object located in accordance with the historical documentary and town-planning principles can be Goloseevsky park named after M. Rylsky, placed according to town-planning and historical and documentary principles: during 1951-1964, near the northern edge of the park the Ukrainian poet M. T. Rilsky lived and worked on 7 M. Rylsky street, (currently - the museum).

The second group is formed by the criteria that characterize the compositional integrity of the memorial object - the correspondence of functional zoning and planning structure to the theme of the park, as well as the compositional integrity of the three-dimensional structure of the park.

Functional zoning of memorial parks has a number of features that are determined by their function and thematic orientation, which in turn affects the planning and three-dimensional structure of the park environment. Such circumstances determine the importance of assessment, the functional zoning and the planning structure of the memorial parks, analyzing their compliance with the thematic and ideological features of the object.

The correspondence of functional zoning and planning structure to the theme of the park criterion is estimated as follows:

1 point – the presence of functional areas that do not correspond to the theme of the park, as well as separate elements of the planning structure, which correspond to the ideology and style of the park (usually in the central part), however the integrity of their construction is absent;

2 points – the main functional zones and elements of the planning structure of the object, characteristic of the memorial parks, correspond to the stylistics of the park's space of the object, but the integrity of their composition is disturbed by the formation of secondary elements or functional zones that were formed during the existence of the park and are in the immediate vicinity of the central part;

3 points – the main elements of the central part of the planning structure of the object are characteristic of the memorial parks, correspond to the stylistics of the park space, the preservation of the main composite forests and prospects,

the presence of all functional zones that must be located on the territory of the memorial parks, but their correlation is violated;

4 points – at the site there are all functional zones in the corresponding ratios, elements of the planning structure in the central part are characteristic of the memorial parks and correspond to the stylistics of the park space, the main composite axes and perspectives are preserved, however there are minor violations that are concentrated on the periphery of the park;

5 points – the planning structure of the object is an integral composition, in which all elements are subject to the thematic orientation of the park, emphasize the ideological and stylistic features of the three-dimensional structure, represent the indirect means of expressing the ideological load.

The importance of the analysis of functional zoning, among other things, is due to the results of the study of the memorial parks in Kyiv, during which it was discovered that some parks, besides the main one that was mentioned, perform several additional functions. For example, the Peremoha Park is characterized by a controversial combination of functions (memorial and entertainment), so it is estimated at 1 point. The "Slava" park, the functionalzoning of which is characterized by the presence of two different historical events of the memorial zones: the Memorial of the Eternal Glory with the obelisk on the grave of the unknown soldier and the Memorial to the Holodomor victims, dedicated to various historical events, but combined with the tragedy of these events. was evaluated as the highest among the researched objects by the score (4) according to this criterion. The only irrelevant functional component within the territory of this object is a children's playground located at a distance of about 50 m from the memorials.

The compositional integrity of memorial park is determined by its three-dimensional structure and affects the expression of thematic load also it is specific feature of each park. A prerequisite for objective assessment is the degree analisys of accordance of three-dimentional composition to park thematic. In addition, the definition of elements that violate the planning and compositional integrity of the park does not correspond to the subjects necessary for an objective assessment of its significance as a memorial object, as well as substantiation of rational directions for its reconstruction. The importance of defining disharmonious elements is emphasized by Ode, Tveit & Fry [16], highlighting disharmony as a separate indicator that can act as a visual characteristic of the landscape.

The compositional integrity of the three-dimensional structure of memorial park criterion is scored the following way:

1 point – chaotic placement of plants in the territory or solid masses without expressed composite integrity, discrepancy between the spatial organization of the theme of the park, the presence of separate components (in the central part), which emphasize the elements of the planning structure;

2 points – inconsistency of the general composition of plants with the themes and functions of the object as a memorial park, however, the presence of clearly expressed components of plantings (decorative groups, solitaries, curtains, etc.) and an agreed composition;

3 points – the composition of plants was formed during the laying of the park, but it has changed during the operation of the object. The presence in the central part of decorative groups, solitaries and other components of the spatial organization of the object, that characterize the period of the laying of relevant topics;

4 points – the composition of plants (mainly in the central part) corresponds to the theme of the park, there is a clear expression of the components of plantations and elements of spatial organization of the park, which, among other things, act as indirect means of ideological load;

5 points – the composition of plants is integral, all elements of its spatial organization are available, plantations along with the formation of the three-dimensional structure of the memorial complex act as means of expressing the ideological load.

Describing the compositional integrity of research objects, one should pay attention to the Slavy Park, which is characterized by a panoramic compositional structure. The planning structure of the park is subordinate to the compositional dominant, which emphasizes its memorial purpose, in the memorial zone, the formal style, and the pleasur and the picturesque style are used. Present plantations emphasizing the ideological load of the park at the associative level - Sorbus aucuparia 'Pendula', Swida alba L. Opiz., Viburnum opulus L., Prunus divaricata 'Atropurpurea', Berberis thunbergii 'Atropurpurea'. Symbolic character is also given to cobblestone and small architectural forms, the rating according to this criterion of the park is at the level of 4 points.

The most voluminous is the study of the significance of the components of the three-dimensional structure of a memorial object, the results of which are the basis for evaluation according to the criteria of *the third group*, which includes: colour accordance to park theme; state and value of architectural elements in disclosing park theme; state and value of paths paving and engineering equipment in disclosing park theme; compliance of flower design with the theme of the park; features of using means of expressing the ideological load of the park.

One of the general stages of memorial park composition assessment is an analysis of its colour peculiarities, since colour has the greatest influence on psychological and emotional state of a person, it is a significant means in formation a comfortable environment depending on the functional purpose, ideological and thematic load and other features of the park object.

The importance of landscape colour in the context of memorial parks is a perspective area that would allow to form a purposeful environment depending on landscape objects functional peculiarities and ideological load of a park or a separate memorial. The criteria of colour accordance to park theme was evaluated by the following indicators: functional colours existence, their quantity; placement of functional colours (of main parks view-points in memorial zones); a colour bearers (their harmonization with the park environment in general); disclosure function by planting (during the year, colouring of plants). To calculate the quantitative indicators of park colouring, the method for assessing the colour of the landscape was used (Gatalska & Mavko [5] Oleksiichenko et al. [18, 20]). The theoretical basis for the formation of this criterion were classifications of colour elements according to Abisheva [1], Georgberidze [6].

The colour accordance to park theme criterion is scored the following way:

1 point – functional colours are absent or present in small amounts which are pleaced chaotically; colour bearers are not a good combination with landscape; greenery has a monotone colouring;

2 points – functional colours are present in small amounts only in some view-points; colour beares are partially changeable or constant; plants do not expose functional colours;

3 points – functional colours are present in small amounts only in some view-points; non-solid colouring plants with short-term colouring are presented in park composition;

4 points – functional colours are present in large quantities in main view-points of memorial zone; all types of colour bearers are harmoniously included into landscape; non-solid colouring plants with long-term colouring are presented in park composition;

5 points – functional colours are present in large quantities in main view-points by all colour bearers; solid-colour plants with long-term colouring are presented in park composition.

The highest score on the criterion of correspondence to the colour theme of the park was not given to any of the research objects, and the The Slavy Park is the most relevant and is at 4 points, because in general it is a good example of the landcape coloring, and the coloring corresponds to its memorial function. Mostly because of achromatic colours of memorials (black – 3,4 %, grey – 24,0 %), white colour of the sky (24,2 %) and large quantity of green plants (16,9 %) and cool colours (18,9 %), whale quantity of other colours is small (12,6 %). There are full-colored children playgrounds in the park that do not allow disclosing the park's memorial function, but they are located far away from memorial zone.

Architectural elements (monumental, decorative, utilitarian and etc.) as a rule are one of the main components of park composition. The main memorial often forms the basis of composition of park central part and sometimes of the whole park. A considerable number of architectural forms of utilitarian and decorative purposes, engineering structures, which should be included into the general composition and emphasize the park theme, are located on the memorial complex territory. The significance of the elements that directly or indirectly reveal the park theme are important in park architectural components assessment.

State and value of architectural elements in disclosing park theme criterion is estimated as follows:

1 point – the presence of only a central memorial that illuminates (directly or indirectly) the event which the park is dedicated to; the street furniture placement that are neutral or controversial;

2 points – the architectural elements of the park (monumental, decorative, utilitarian) emphasize the theme of the park, but they have significant damage and can not be used in accordance with the purpose without restoration work;

3 points – architectural elements have historical value and were created during the laying of the memorial complex, compositionally and ideologically subordinated to the main dominant, are in a satisfactory condition, their individual elements need restoration; it is permissible to have a small number of utilitarian utilization elements neutral to the subject matter;

4 points – architectural elements relate to the period of laying of the park, compositionally and ideologically are subordinated to the main dominant, are in good condition and perform all functions;

5 points – the affiliation of architectural elements (usually of the main memorial) to objects of cultural heritage, compositional and ideological coherence of all street furniture; architectural elements fully perform all functions and are means of expressing an ideological load, and their condition can be estimated as good.

As a result of the territory of experimental objects assessment, according to this criterion, a score of 4 points was awarded to the Slavy Park, within which the National Museum

"Holodomor Victims Memorial" is located, which is one of the most successful examples of the use of small architectural forms for expressing the thematic load. The composition of the complex is formed on the central axis, which begins at the central entrance to the Memorial complex, on both sides of which there is a sculptural composition "Angels of Sorrow" - this is the embodiment of the soul guards of the deceased in the Holodomor.

This composition is a kind of "input portal" to the Memorial. It should be noted that the placement of buildings is quite good in the light of modern landscape park and its external environment, including the Kiev-Pechersk Lavra. All sculptures are in the content area of the museum dedicated to the victims of famine and have symbolic value and, thus, creating an extremely strong emotional impression that is reinforced by a gradual reading of the overall composition, the culmination of which is the monument "The Candle of Memory" – symbol of the Ukrainian people's memory about the tragedy. However, the main area is the dominant compositional obelisk that serves as a direct means of expressing the ideological load. In addition to individual monuments of individuals associated with the events of World War II, such memorial alleys are the emphasis on the park territory: Alley of Heroes, Alley of Soldiers Glory.

An example of a functional contradiction of architectural forms is the Peremoha Park, although it contains a lot of elements of the composition that directly express the content of the park theme. First of all, this is the Immortality Hill, buried from the ground brought from the soldier's graves, as well as the monument "Women of War", to the left of the sculptural composition – memorial tables, which are staged by the main events of the Second World War – are included in the composition of the entrance area of a park, a monument to the Widowed Mother near the Immortality Hill and the composition "People of the War". Also, as an accent in the northeastern part of the park there is a monument dedicated to the Border Guard's Alley. The composition of the alley consists of wooden columns, which are located at its beginning and are of a symbolic nature, a stone indicating the name of the thematic zone. At the end of the main alley – a corner of military equipment, and in the western part – a stone wall with the name of the park. Accordingly, along with the saturation of the Peremoha Park thematic architectural elements revealed the street furniture, which contradict the theme of the park – playgrounds, attractions, trade pavilions, etc.

Elements of the path network (including staircases and ramps) and engineering equipment (retaining walls and lanterns) can, apart from utilitarian functions, be means for expressing an ideological load, which is an important aspect of emphasizing park theme. Paths paving may be a platform for creating symbolic inscriptions and themed patterns. Retaining walls can enhance the impression of the reliefs, forming a rhythmic composition; stairs can act as compositional line.

State and value of paths paving and engineering equipment in disclosing park theme criterion is scored the following way:

1 point – the presence of elements of engineering equipment in the central part of the object (near the main memorial), which do not emphasize, but do not contradict the theme of the park, are in a satisfactory condition and perform their functions;

2 points – the paths paving and elements of the engineering equipment are available in sufficient quantity in the territory of the memorial object and are in good condition, however, they do not emphasize the theme of the park, but do not contradict it;

3 points – the paths paving and elements of engineering equipment, in addition to the main functions, act as means of expressing the ideological load of the park, emphasize the style of the main memorial and the park space as a whole, but have certain damages and require repair and restoration works;

4 points – the paths paving and elements of engineering equipment fully perform utilitarian function, emphasize the stylistics of the main memorial and the park space in general, are in good condition, do not require repair and restoration, on the periphery, it is allowed to place elements requiring minor repair and restoration works;

5 points – the elements of the paths paving and elements of engineering equipment are located throughout the park, fully perform utilitarian functions and emphasize the stylistics of the main memorial and park space in general, are in good condition.

The "Memory arable land" paving and other and ornamental paving the territory of Holodomor Victims Memorial are one of the most successful examples of park theme load, which are reproduced in the paths paving (Fig. 1). That is why Slavy Park and Peremoha Park are given 5 points by this criterion. Peremoha Park has a linear composition of the path network. Most of the park's paths are made of paving the gray colour, and in the memorial and exposition zones there is a specific design of path paving with a different compositional solution, according to park theme.

Flowers are important components of the park space, they emphasize the theme of the memorial park or complex, complete the composition, and sometimes increase the emotional influence of the main memorial. It is important to mention that flowerbeds in a memorial park, which are created

only for aesthetic purposes, usually do not play an important role in revealing the ideological load, and sometimes contradict it and disturb the compositional integrity of an object (Fig. 2). The most valuable are parterres and flowerbeds located near the main memorial, which, emphasizing its style and increasing the emotional impact on a person, can act as indirect means of expressing an ideological load.

Accordingly, the assessment of compliance of flower design with the theme of the memorial park can be made as follows:

1 point – in the absence of a flower design, but the presence of a lawn on the whole territory of the park in good condition. The score can be lowered to 0 points if the flower registration contradicts with the theme of the park and the lawn condition is unsatisfactory;

2 points – flower design is available only in the central part, but the themes of patterns and species composition of plants are exclusively decorative in nature;

3 points – flower design corresponds to the theme of the park, only in the central part, while throughout the park flower beds perform only a decorative function;

4 points – flower design throughout the territory improves the decorative qualities of the park space, the overall compositional solution is consistent with the theme of the park, but the periphery of the flower beds are exclusively decorative in nature;

5 points – parterres and flower beds located near the main memorial, emphasize its style and enhance emotional affect and act as indirect means of expressing an ideological load. In addition to the central part, they are placed near the composite accents, where the emotional impact of the main memorial is weakened.

Thus, the final stage is to determine the means of expressing the ideological loading of the park both direct and indirect (Fig. 3, 4, Table 1). In particular, the features of using means of expressing the ideological load of the park criterion is scored the following way:

1 point – presence of the main memorial element - a monument, a memorial plaque, a memorial sign, etc. as a direct means of expressing an ideological load;

2 points – the presence, besides the basic, of additional means of expressing the ideological load, which necessarily emphasize its meaning and are related to the theme of the park;

3 points – the usage of indirect means (plantations, relief, paving elements) in the composition of the memorial park, in addition to direct means of expressing the ideological load, which are located in different parts of the territory and emphasize the thematic orientation of the park, however, do not create an integral composition;

4 points – the presence and justified usage in the composition of the park space of direct and indirect means of expressing ideological load, mainly in the central part of the memorial complex;

5 points – the compositional construction of the park's territory is an inseparable synthesis of all elements of the park space, which are both direct and indirect means of expressing the ideological load, are subordinated to the dominant and fully reveal the idea and thematic orientation of the park space at the ideological, compositional and emotional levels.

After conducting the assessment based on the criteria and determining the total number of points, the objects can be divided into groups which characterize the current state and directions of rational using of the park as a memorial object: *the most valuable memorial parks* (50–35 points) – can function as memorial-historical museums, memorial parks, need measures aimed at their preservation; *the valuable memorial parks* (34–21 points) – it is necessary to create a project for park reconstruction, the scale of which is determined in accordance with elements that destroy its compositional and ideological integrity; *the low value in memorial aspect parks* (20–15 points) - restoration of the park for use as memorial park is quite labor-intensive, primarily because of significant damage to all elements of park space. For rational use of park territory it is necessary to determine the possibility of adapting the park to modern conditions without or with the change of its memorial functions; *have no memorial and cultural-historical value* (14 or less points) - restoration of park composition in general as a memorial park is inappropriate, since most elements of park space do not accord with memorial theme and do not have cultural-historical or architectural value. If the place of memorial park is connected with historical events to which it was dedicated, it is impossible to transfer the memorial, but the park must be adapted to modern needs of the society, and the memorial elements must be localized in separate functional zone.

Summarizing the results of complex assessment of research parks (Fig. 5), the most valuable memorial park is the Slavy Park (42 points), the rest belong to valuable memorial parks: Peremoha Park (33 points); T. Shevchenko Park (34 points); M. Rylsky Park in Holosiivo (29 points).

Analyzing the results of assesment research objects according to individual criteria, one should pay attention to the unused potential of flower decorations

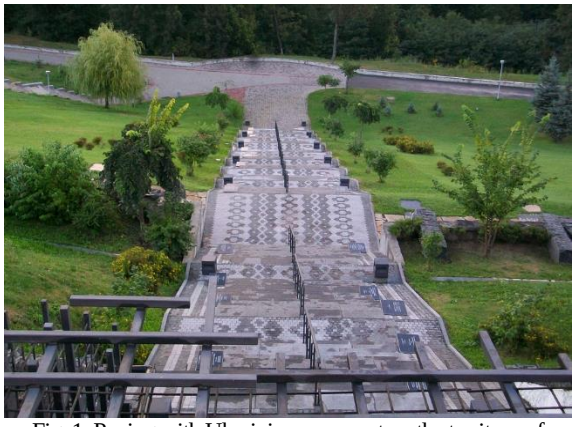

Fig. 1. Paving with Ukrainian ornament on the territory of Holodomor Victims Memorial (Slavy Park) [photo by the authors, 2015]

Fig. 2. Themed flowerbed at the monument "Widowed Mother" in Peremoha Park [photo by the authors, 2016]

Fig 3. Direct means of expressing ideological load of the Slavy Park ("Black boards" Alley; "Candle of Memory"; Memorial of Eternal Glory) [photos by the authors, 2014-2017]

Fig. 4. Indirect means of ideological load expression of the Slavy Park (symbolic sculptures "Angels of grief"; symbolic sculpture of girl with five spikes; symbolic paving) [photos by the authors, 2014-2017]

in the Slavy Park as a means of expressing the ideological load and underscoring its stylistics, the inappropriate location of the playground and the need to improve the composition of the plantings.

For functioning and rational use of the Peremoha Park and T. Shevchenko Park at the present stage it is necessary to carry out further research and create projects for the reconstruction of the park space, the scale of which is determined in accordance with elements that violate their compositional and ideological integrity. In particular, the main problem of the T. Shevchenko Park is a chaotic placement of plantations, the controversy of flower design and a significant number of street furniture, which do not correspond to the functional purpose of the park and are not consistent stylistically neither with the main memorial nor with each other.

An important component that contributes disharmony to the composition of the park are flowerbeds arrangements, the configuration of which changes annually and, as a rule, contradicts the theme of the park. In addition, in the Peremoha Park, along with a number of elements that directly and

TABLE 1

The means of expression of the ideological loading in memorial parks that are dedicated to war themes [created by the authors, 2018]

Objects	Direct means of expressing ideological load	Indirect means of expression ideological load
Slavy Park	• National Museum "Memorial to Holodomor Victims"; • Memorial of Eternal Glory; • "Candle of Memory" in the center of Holodomor Victims Memorial; • monuments: monument of I. Kozhedub, L. Bykov; • memorable alley: Alley of Heroes, Hero Cities Alley, Alley of Glory soldiers, "Black boards" Alley.	• sculpture of girl with five spikes; • symbolic paving; • symbolic sculpture "Angels of grief", "millstones of history" in the entrance of Holodomor Victims Memorial and other architectural forms; • relief (panoramic composition); • planting (winding, purple, pyramidal shape) namely *Sorbus aucuparia 'Pendula', Swida alba* L. Opiz., *Viburnum opulus* L., *Prunus cerasifera subsp. pissardii* Dost, *Berberis thunbergii 'Atropurpurea', Malus niedzwetzkyana* Dieck., *Berberis vulgaris 'Atropurpurea'.*
Peremoha Park	• mound of Immortality; • monument "Women of War", monument of Mother Widow; • memorial plaques, information stones.	• remains of entrenchments (historical relief); • some planting (*Betula pendula 'Youngii'* in memorial zone of park, Borderguards Alley with *Populus bolleana* Louche); • thematic flower design (parterres, rock garden).

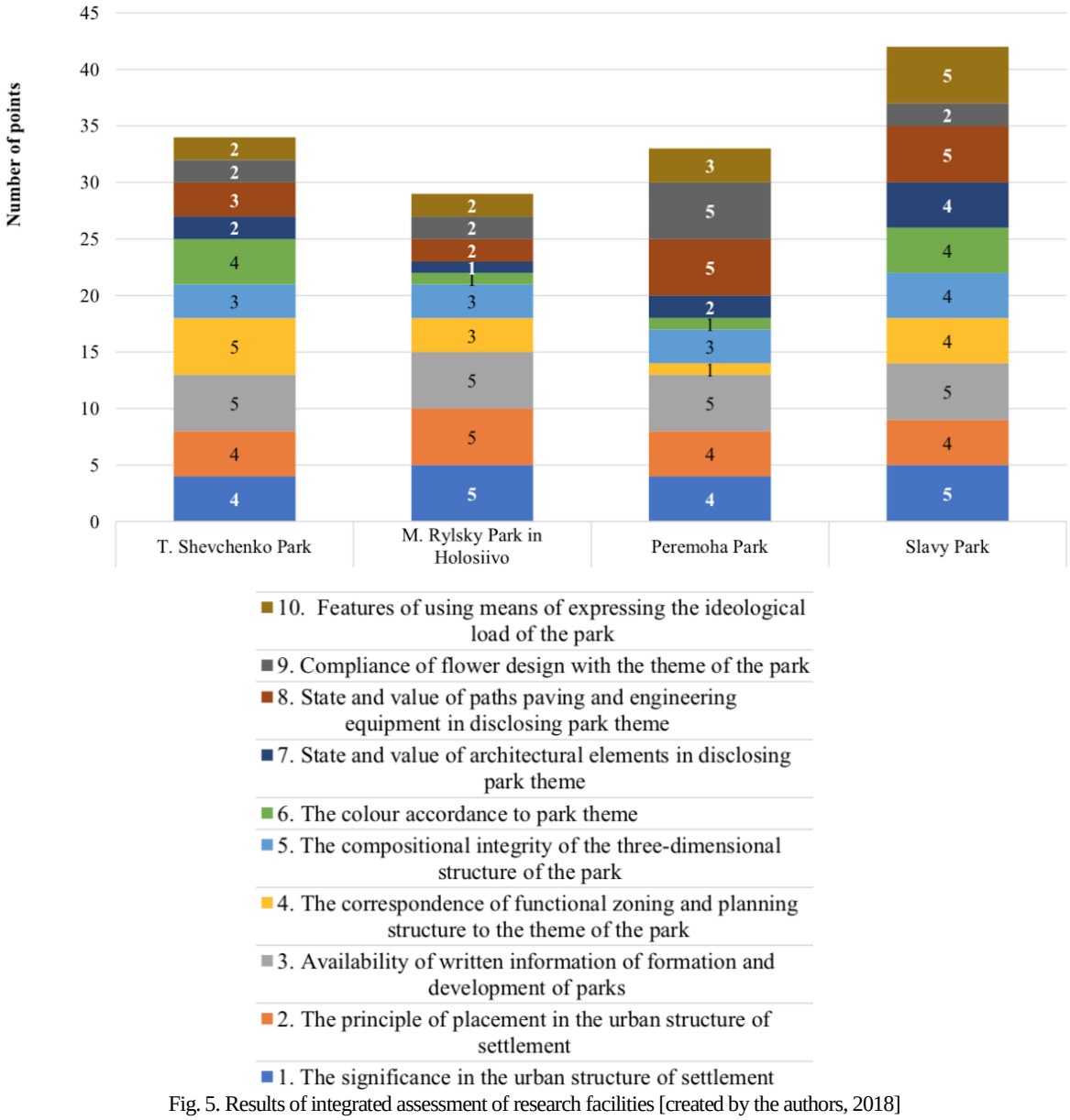

Fig. 5. Results of integrated assessment of research facilities [created by the authors, 2018]

indirectly emphasize the theme of the park and reveal the ideological load, there are entertaining attractions that largely neutralize the influence of thematic elements and violate the integrity of the three-dimentional composition. In particular, to recreate it and focus on the theme of the park, it is necessary to visually separate the entertainment elements from the memorial ones. One of the solutions can be the separation of entertainment and children's areas and the organization of a family holiday park, which should be solved at the legal and organizational levels.

The main problems of the M. Rylsky Park is the discrepancy between the planning structure and functional zoning, the architectural elements of the theme and park stylistics, flower arrangement. This discrepancy is caused by the fact that the components of park space of the M. Rylsky Park was formed to meet the recreational needs, the memorial function was small, probably secondary. Nowadays the park is important as a center of recreation and an element of natural forests of Goloseyevsky forest, but the memorial function is not sufficiently expressed.

Conclusions

One of the aspects of the preservation of memorial parks as objects of cultural heritage, in the context of the formation of scientifically grounded approaches to the reconstruction of their territory, is the assessment of the present state as the material components of the park space, and the features of the use of symbolism and means of expressing their ideological load.

On the basis of analysis of available techniques for evaluating individual components of the park space, the main aspect is the assessment of exclusively material elements of the park space – their qualitative, aesthetic and quantitative characteristics, and there is no differentiated approach to the evaluation in accordance with the functional features of the parks that limits the significance of one or another criteria. In addition, while using existing evaluation methods, symbols, ideologies, thematic orientation of the park, the stylistic unity of the composition, as well as the colour of park landscapes, which is an important means of highlighting its thematic orientation and its separate functional zones, whose evaluation currently is fragmentary in nature, remains out of focus.The newest methods for assessing the cultural-historical value and means of expressing the ideological load of memorial parks are developed, which include a system of criteria that characterizes both general features and the state of the components of park space at the present stage and is the basis for forming directions for its further rational use.

The evaluation of the memorial park carried out according to the recommended criteria can characterize the general features of the park, the degree of preservation at the present stage and become the basis for forming directions for its reconstruction.

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Kopsavilkums. Viens no pieminekļu parku kā kultūras mantojuma objektu saglabāšanas aspektiem ir parka telpas sastāvdaļu pašreizējā stāvokļa novērtējums, un simbolikas izmantošanas pazīmes, un to ideoloģiskās slodzes izteikšanas līmenis. Pamatojoties uz pieejamo tehnisko paņēmienu analīzi, lai novērtētu parka telpas atsevišķās sastāvdaļas, galvenais aspekts ir parka telpas atsevišķo elementu novērtējums. Nepastāv atšķirīgas pieejas parku vērtēšanai, kas ierobežo viena vai otra kritērija nozīmi. Izmantojot esošās vērtēšanas metodes, simbolus, ideoloģijas, parka tematisko orientāciju, kompozīcijas stilistisko vienotību, kā arī parku ainavas krāsu, tiek iegūta sagatave parku detālam pētījumam. Saskaņā ar zinātnisko literatūras avotu analīzes rezultātiem un Kijevas piemiņas parku pētījumiem 2011.-2017. gadā tika izstrādātas parku ideoloģiskās slodzes novērtēšanas metodes. Tostarp radīta kritēriju sistēma, kas raksturo gan kopējās iezīmes, gan parka vietas sastāvdaļu stāvokli pašreizējā posmā, tā veidojot virzienus parku turpmākajai racionālai izmantošanai.

Parki savas vēstures laikā ir bijuši dažādu mākslu sintēze, un tagad tie ir valsts kultūras un vēsturiskā mantojuma centri. Dārzu un parku formas un saturs ir mainījies līdz ar sabiedrības vajadzību attīstību, kas noteica parka galveno komponentu pārveidošanu. Parku pētījuma pamatā ir analizēta to veidošanās un attīstība, un šo transformāciju procesu sekas. Izvērtējot minētos datus, tiek izveidotas optimālas parku rekonstrukcijas metodes, pielāgojoties mūsdienu apstākļiem, tā popularizējot parka telpas vērtīgāko komponentu saglabāšanu.

Piemiņas memoriāla kompleksam kā pilsētvides elementam ir īpaša kultūrvēsturiskā nozīme, kas nodrošina saikni ar valsts pagātni, ilustrējot politisko ideoloģijas laiku. Piemiņas parka ideoloģiskā izpausme kompozīcijas elementos, veido parka trīsdimensiju struktūru. Tajā pašā laikā transformācijas procesi, kurus izraisa parka ainavas attīstība kā bioloģisks objekts, neatgriezeniski notiek visā parka pastāvēšanas vēsturē.

Pētījuma mērķis ir uzlabot parku telpas novērtējuma teorētiskos un metodoloģiskos principus, izstrādājot kompleksās pieejas teorētiskos jauninājumus memoriālā parka novērtēšanā un metodes aprobācijā.

Pētījumu objekti ir četri Kijevas memoriālie parki: veltīti pazīstamiem cilvēkiem (T. Ševčenko parks un M. Rylsky parks Holosiivos) un kara tēmām (Peremoha parks un Slavy parks). 2011.-2017. gadā veikto teritoriju apsekojumu rezultāti kļuva par pētījumu materiāliem. Pamatā tika izmantotas zinātniskās metodes - dabas apsekojumi, modelēšana ar grafiskās analīzes pētījumiem, fotofiksācijas un foto analīze, zinātnisko literatūru avoti un arhīvu materiāli.

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A Comprehensive Methodology for Assessing the Quality of Landscape Architecture Study Programmes in European Higher Education Institutions

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Abstract. In the light of recent environmental and socio-economic challenges that face the modern urban regions, the implication of current needs for education quality has been discussed. Now a further step for practical actions of re-shaping higher education in Europe takes place. The quality of teaching of landscape architects has a direct impact on the quality of the professional services and their contribution to design, planning and management of urban open spaces, heritage sites and objects, parks and gardens and (green) infrastructure. A wide variety of landscape architecture (LA) study programmes across Europe provide education that differ in scope, content and quality.

Two European landscape associations – the European Council of Landscape Architecture Schools [4] and the International Federation of Landscape Architects (IFLA) Europe developed guidelines for landscape architect's education that covers environmental, engineering and artistic competences and soft skills [4] (IFLA 2008). For IFLA the requirements are a tool for the professional recognition of the programmes. The ECLAS Guidance report (2010) focuses on the core, subject-specific and generic competences that students should acquire in the education process.

This framework with requirements, recommendations and guidelines for LA studies aims to increase the quality of the current landscape architecture studies; beyond that, it is used to develop a common tool for assessing the quality of landscape architecture education at several universities in Europe. The results of the assessment reveal the strengths and the gaps of the analysed study programmes and teaching subjects. The outcomes of this inquiry give a clear picture for the schools which study modules and courses should be improved and how to meet the common requirements. At the same time, the method is used to keep and further develop the strong sides of the study programme at each university. Looking at the bigger picture of LA education in Europe, the map of subject-specific competences in landscape architecture training is further developed, by adding cutting-edge competences that are proposed by the participating universities and professional associations.

Keywords: landscape architecture, teaching, competences, education, professional practice

The first landscape architecture (LA) teaching programme was founded in Europe at the Norwegian Agriculture University in 1919 [15]. Now more than one hundred European higher education institutions (HEIs) offer a wide range of Landscape Architecture (LA) study programmes [2]. Although there are common approaches in teaching [5] there are evident differences in content, structure and quality and inequalities between these LA study programmes in the different European regions. The higher education sector including the LA education is undergoing dramatic changes in many European countries where the universities are closing or changing these programmes, while at the other hand some schools are developing new LA study programmes. Economic, demographic, legal and didactic factors trigger the changes that are emerging for the profession in the run of its establishment in different countries. The competences for landscape architecture need to be innovated due to current needs of society and new challenges such as climate change, water management, and sustainability. Therefore, we vitally need a method based on a common European understanding of landscape architecture studies that focuses on jointly developed study requirements. This method could be used for assessing the existing and building the new LA study programmes in order to achieve higher education quality by harmonising the LA studies across the European continent. The improvement of study programmes in this respect may facilitate increased student mobility between the schools and have an impact on easily acquiring the recognition of Landscape Architecture professional qualification in Europe.

This paper presents a method for assessing those aspects of quality that relate to course content (competences), teaching modes, and assessment methods. At the same time, the method can benchmark the structure and scope of current study programmes and subjects for their compliance to the common European requirements for landscape architecture studies. The aim of this research is to test the efficiency and applicability of the developed method by implementing it on a selection of landscape architecture study programmes and

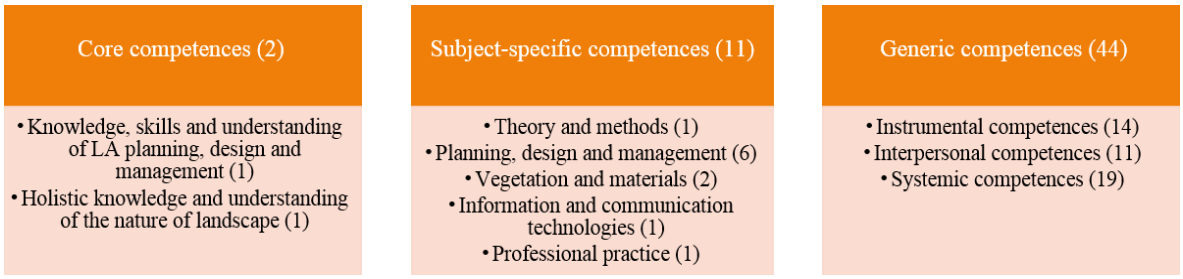

Fig. 1. Amount and categories of core, subject-specific and generic competences in Landscape Architecture [ECLAS 2010]

subjects as a quality assurance tool for gaining insight in their strengths and the gaps. In addition, we use the results to discuss the further application and impact areas of the method on development of new LA study programmes.

The authors have assessed landscape architecture study programmes and subjects at five European universities: Van Hall Larenstein University of Applied Science, the Netherlands (VHL); University of Agriculture in Krakow (URK), Poland; Szent István University in Budapest (SZIE), Hungary; Estonian University of Life Sciences (EMU) in Tartu, Estonia; and Vilnius Gediminas Technical University (VGTU) in Lithuania. The obtained results were analysed and discussed. The survey uses as a basis the academic and professional requirements for the LA education that were developed and adopted by ECLAS and by IFLA Europe in the period of 2008 – 2014. The results this study may give an opportunity to revise and amend the guidance documents in Europe if that proves to be reasonable.

The overarching goal of surveying the landscape architecture programmes in participating institutions is to strengthen strategic collaboration and partnership between the universities by harmonising important aspects of the education quality. By obtaining more information on the compliance of the present landscape architecture study programmes at the participating institutions would enable the schools to create the pathway and the timeline for updating the existing study programmes or establishing the new ones in this field. The universities themselves could use the tool for internal quality assessment and monitoring the programme's quality by running it annually or at other preferred frequency. In 1989, European higher education institutions providing training in landscape architecture have associated aiming to provide a platform for collaboration and improving the quality of education of landscape architects across the continent. Similarly, IFLA Europe aims to coordinate landscape architect's professional activities and keeps a careful look on the study programmes that are delivered across the European continent.

Background and literature

As landscape architecture is an extremely diverse profession overarching the ecologic, social, artistic and other fields of activity, the diversity of the professional field is also the main challenge for studies, research and professional practice including assessment of these activities [6]. The question if one assessment system can test different university programmes in different countries is raised in the context of the global trend of evaluating education quality [8]. Authorities, universities and even media measure the quality of existing study programmes worldwide in many different ways. Some assessment methods suggest doing the assessment by analysing the study outcomes as student's drop-off, exam failure, employability of graduates and similar empiric information instead of assessing the curricula. Assessment of the education and training process has become a common practice in many fields of professional activities, and complex methods are used to do that. The CIPP method (context – input – process – product) is pointed out as being universally acceptable for assessing the quality in the terms of construct validity of education programmes in many different fields, adjusting it to the area specifics [12]. In this case, exploratory factor analysis and confirmatory factor analysis may be used to identify the desirable training subjects. In this and many other cases, the quantitative indicators are derived from the qualitative assessment for being objectively comparable and valid for discussion. Critical review is essential for the assessment of any process, so that goes also for a study programme. Some outstanding researches in this field outline the importance of critical thinking as a progress driver for the teachers, students and for the whole of the education process [17].

Two European landscape architecture associations – ECLAS and IFLA Europe have developed a set of guidelines for landscape architecture studies. The IFLA UNESCO Charter for Landscape Architecture Education (2008) defines the education qualifications needed to practice the profession based on the diverse needs of the society and sets several quality criteria for landscape

architecture education focusing on the practical studio work, and the relation between teaching, practice, and research [9]. It also advises academic institutions on creating self-assessment systems as a tool for continuous quality assurance. The IFLA Charter on Landscape Architecture Education gives the main education objectives and emphasises the need for exchange programmes between the teachers and the students at an advanced level [10]. Guidance requirements for landscape architecture studies in Europe [4] cover environmental, engineering, artistic and interpersonal competences that learners acquire in the education process. In particular, it presents the complex of multiple professional, academic and generic competences (Fig. 1).

There are two core competences and eleven subject-specific competences that directly relate to the discipline of landscape architecture; the forty-four generic competences are more general applicable and comprise for instance aspects of communication, leadership, and ICT skills [4]. Researchers point out the interdependency between the quality of study programmes and their delivery, on one hand, and the quality of outcomes, on the other. University-managed internships as a part of education process in many cases proved to be an efficient way for the students to prepare for professional practice [1]. Researchers constantly debate about the relation of academic education and the real life practice where certain analysis and research methods acquired in the study process are essential [15], and that is an important aspect for assessing the quality of any study programme. After the implementation of a new developed or renewed (part of a) study programme it is important to survey the student's experience and expectations of the outcomes of academic education. Studies reveal that students have different study habits and preferences, depending on their background and situation. For instance, non-traditional students (adults, mid-career students, students working for a second degree, etcetera) prefer a larger share of individual assignments to group work [7]. Modern ICT-based learning tools can be used to help solving the needs of some groups by introducing distant learning, simulation, gaming and the other teaching methods that are preferred by the students.

The aspect of interaction between the subjects of neighbouring education programmes is pointed out as having impact on the quality of study outcomes [11] therefore this aspect could be a part of the course design and assessment methods. Modules that integrate working together with other disciplines or making use of knowledge and skills of various disciplines can contribute to developing an interdisciplinary perspective. Research that focuses on the contents of education in landscape architecture and other design fields shows the need to evaluate how the process-oriented assignments balance with the result-oriented assignments in developing student's creativity as well as productivity [13]. For that, different teaching methods are used, and their variety creates an optimal teaching climate. For landscape architecture, the studio or the practical design exercise are key learning methods because these offer a context for learners to construct their own learning process in a collaborative way [5]. There should be a variety of assessment methods to evaluate the learning process and study outcomes that were supported by different teaching methods. Legal requirements in each country regulate the registration and evaluation procedures of study programmes including the joint and double-degree study programmes. The legal acts that regulate this process set the rules more for the procedures and little for the quality of the study programmes. As an example, the general requirements for joint study programmes in Lithuania [14] mainly focuse on the procedures, documentation and formalities and very little on the content and quality.

As it comes from the background analysis, the assessment methods that different universities, authorities and researcher's groups currently use to evaluate the quality of landscape architecture and the other creative discipline's study programmes demonstrate a wide array of tools, accounting for the large number of criteria in the variety of aspects in their own different ways. Comparing the results of such assessment seems hardly possible as these methods differ too much and do not aim to become a universal assessment method applicable for a number of schools at any area or a region. In most of cases, university staff create and use a self-designed assessment method as a part of formally required self-assessment procedures. In this context, two ideas arise for the recent research. First, developing a universal assessment method and an easy-to-use practical assessment tool would enable more schools and their staff to analyse and evaluate the quality of education programmes in landscape architecture. Second, there is a need to deliver a functional assessment system based on a regionally e.g. Europe-wide accepted system of qualities and values to validate the quality of education programmes in landscape architecture across the European continent and beyond that. The outcomes of assessment that are designed for improving the education quality should be used for that purpose, and are not intended to be taken up in regulation, used for decisions on funding programmes or other purposes that do not focus on quality of education.

Methodology and its application

We created a universal method for assessing the quality of bachelor and master study programmes in landscape architecture based on the internationally accepted quality requirements and presented the results in a common visual form. The method uses the experience and the achievements of the East Baltic Network of Landscape Architecture Schools (EBANELAS www.ebanelas.org) [3] and follows a set of consecutive steps. It comprises the assessment tool that we have built according to the European quality requirements for landscape architecture competences [4], the self-assessment process executed by each participating school, and the analysis and interpretation of the results done by the authors of this paper.

The assessment tool features the list of 49 competences consisting of core (2), subject-specific (11) and generic (30) competences that the guidance document presents [4]. The core competences (C) cover the core knowledge, understanding and skills of planning, design and management that a specialist need to conserve the existing or create the new landscapes. It also covers the holistic understanding of the nature of landscape. The subject-specific (SS) competences are the main professional abilities that a student is supposed to acquire during his or her studies. The SS competences include theory and methods, skills for planning, design and management, urban opens space, cultural landscapes, infrastructure projects, information and communication technologies and the abilities to apply these skills in a professional practice. The 30 generic competences (G) include the instrumental, interpersonal and systemic competences. After carefully analysing the teaching processes and programmes at the participating schools, on one hand, and the professional practice specifics, on the other hand, in the EBANELAS academic collaboration (East 2014) we extended the list of generic competences and added 14 additional competences: four instrumental, three interpersonal, and seven systemic competences. These additions serve to secure the abilities needed for landscape architecture professionals in the constantly changing situation; such as the ability of spatial thinking, ability to present ideas graphically, knowledge of legal and administrative context and knowledge of socio-economic and environmental context. As social skills are more and more important for a creative and productive teamwork [13] we extended the set of interpersonal competences by adding the ability to accept criticism, ability to manage conflicts and ability to manage public participation.

Teaching programmes consist of modules and teaching subjects form a complex system where one can measure the elements by their number and by their scope in ECTS. For this reason, we assessed the compliance to the European study requirements for two aspects – the number of modules or subjects that address a specific competence, and in the number of ECTS that the modules or subjects addressing that competence contain. This allows obtaining results that are more reliable and develop recommendations that reflect the actual situation. For each participating institution, all teaching modules and courses of the programme were listed in the assessment tool on the Y-axis, then the qualitative requirements of the Guidance document [4] were listed in the X-axis. The combinations resulted in a quantitative assessment of the running landscape architecture programmes (four programmes) and teaching subjects (one programme). The academic staff of the five participating universities analysed their own teaching programmes, the teaching process and the contents of each module or a subject taught and based on that responded to the assessment questions. If a particular competence (X-axis) is more likely developed in the assessed course unit of the programme (Y-axis) the response was yes and 1 is inserted, if it is more likely that the particular competence is not developed in the programme the response was no and 0 is inserted.

To evaluate the occurence of the teaching methods used to deliver each module or a course we listed all teaching methods that are most frequently used in landscape architecture education: studio, lectures and seminars, study trips, practical work, internship, e-learning and self-study (ECLAS 2010), and passed this list to the local assessment teams. In the same way, the academic staff of four universities assessed each module or a course against the list of teaching methods: the course that was delivered by a specific teaching method scored one, the course that did not use that method scored zero. Consequently, we listed the most frequent assessment methods used to evaluate each module or course: exam, test, poster presentation, essay, report, project diary, and sketchbook. The occurence of each assessment method in a study module or a course was done in the same way by assigning the grades one or zero for each module or course (Tab. 3). While compiling the results of teaching methods assessment into one table we obtained information which teaching methods are used most and least in the assessed study programmes for LA teaching.

It is important to underline that the number of modules or courses and ECTS were different for each programme as the local teams were assessing the current landscape architecture programmes, modules and courses. We compiled all data into a common analysis sheet, processed the information by deriving the answers to the questions of this research for each study programme (e.g. VGTU, Fig. 2., 3.), compared the average results between the participating universities (Fig. 4, 5), and derived the recommendations for improvement based on the common issues.

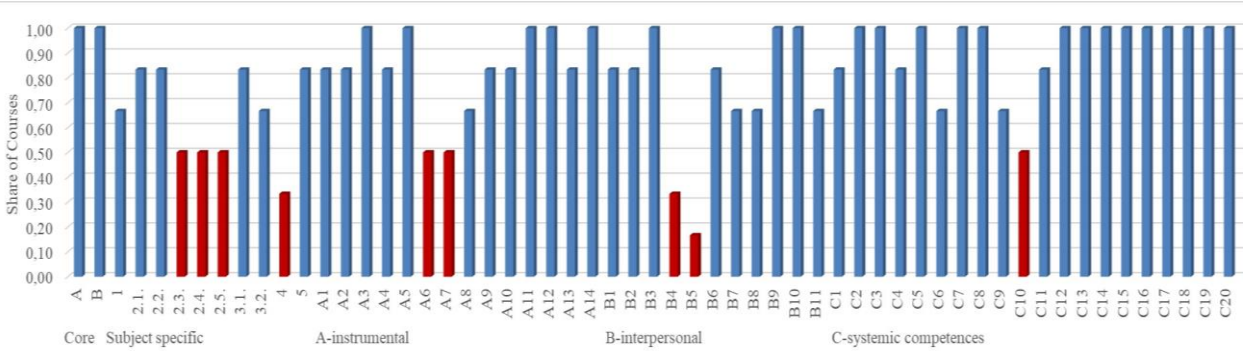

Fig. 2. Share of courses that develop a specific competence (Core – AB, Subject Specific 1-5, Instrumental A, Interpersonal B and Systemic C) in VGTU BArch 2017 [created by the authors]

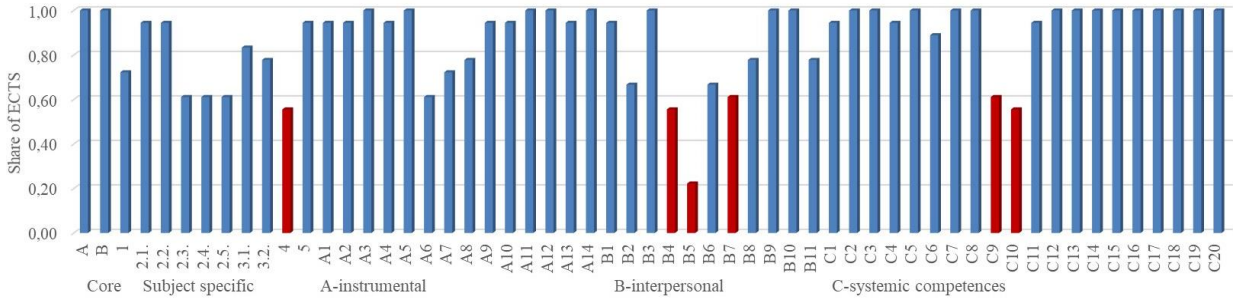

Fig. 3. Share of ECTS that develop a specific competence (Core – AB, Subject Specific 1-5, Instrumental A, Interpersonal B and Systemic C), VGTU BArch 2017 [created by the authors]

For each study programme, we derived the overall average share of the modules or courses that develop certain competences and based on that we determined the minimum threshold as 50% of the average share that marks the line below which the academic staff should improve the modules or courses to address the identified competences. The minimum threshold is different for every study programme as is the average share of modules or courses. In the graphs, we indicated the modules or courses below the threshold in red and figured out which competences are least addressed in all assessed programmes for each study programme and for all assessed programmes taken together (Table 1). This outlines the study areas that universities should upgrade to address better certain competences in LA studies.

Results and Discussion

Using the VGTU Bachelor of Architecture (BArch) programme as an example, we present the layout of the share of modules or courses (Fig. 2) and the share of ECTS (Fig. 3) that the schools have assigned for developing a specific competence. The results of assessing all programme's matching teaching methods (Fig. 4) and the applied assessment methods (Fig. 5) are illustrated below.

Figure 2 shows that the subject specific competences Interpretation and Conservation / Management of Cultural Landscapes (2.3), Conservation and Management of Parks and Gardens (2.4), Planning and Design for Infrastructure Projects and Landscape Impacts (2.5), the instrumental competences Knowledge of second language (A6) and Elementary computing skills (A7) and the systemic competence Initiative and entrepreneurial spirit (C10) are only taught in 50 % of the courses. The subject-specific competence Information Technology in LA (4) and the interpersonal competence Ability to work in interdisciplinary team (B4) are only acquired in 30 % of the courses. The results show that the interpersonal competence Ability to communicate with experts in other fields (B5) is only part of a small share of the courses in VGTU BArch study programme.

Figure 3 shows that the subject-specific competence Information Technology in LA (4), the interpersonal competence Ability to work in an interdisciplinary team (B4), the systemic competences Project design and management (C9) and Initiative and entrepreneurial spirit (C10) is learned in 50 % of the ECTS of the programme. The results also show that the interpersonal competence Ability to communicate with experts in other fields (B5) get relatively little attention by the amount of ECTS (20 %) in the study programme.

By summarising the assessment results for all study programmes, we identified which are the least addressed competences in the study programmes (Table 1). Low occurence frequency we can see for the interpersonal (generic) (24) and subject-specific (22) competences. There are eight competences identified that are the least addressed in

TABLE 1

The core, subject specific and generic competences that the programmes address below the threshold [created by the authors]

University progr., threshold	Core		Subject-specific		Generic					
					A Instrumental		B Interpersonal		C Systemic	
	Courses	ECTS	Courses	ECTS	Courses	ECTS	Courses	ECTS	Courses	ECTS
VGTU 0,71	-	-	2.3, 2.4, 2.5, 4	4	6, 7	-	4, 5	4, 5, 7	10	9, 10
EMU 0,45	-	-	2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 4	2.2, 2.3, 2.4, 2.5, 3.1, 3.2	6, 8	6	4, 6, 7	4, 7	6, 7, 9, 10	6, 7, 10
URK 0,35	-	-	2.2, 2.3, 2.4	2.3, 2.4	6, 13	6	2, 4, 6, 7, 8, 10, 11	2, 4, 7	6, 7, 10	6, 7, 10
SZIE 0,41	-	-	2.5, 3.1, 3.2, 4, 5	4, 5	6, 7, 13	3, 6, 7, 11, 13	1 - 11	1 - 11	6, 7, 9, 10, 19, 20	6, 7, 9
VHL 0,42	A	B	2.3, 2.4, 4, 5	2.3, 2.4, 5	-	-	-	-	-	-
Least addressed competences (common mention)			**2.3 – 4** **2.4 – 4** **4 – 4** 2.5 – 2 5 - 2	2.3 – 3 2.4 – 3 4 - 2	**6 - 4**	6 - 3	**4 – 4**	**4 – 4**	6 - 3 7 - 3 **10 – 4** 9 – 2	6 - 3 7 - 3 10 – 3
Number of competences below threshold	1	1	**22**	14	**9**	7	**24**	**19**	14	11

TABLE 2

The least addressed competences in LA bachelor studies for all assessed programmes [created by the authors]

No.	Competence's segment	Title of the competence	Frequency
1	Subject-specific	2.3. Interpretation and conservation / management of cultural landscapes	7
2		2.4. Conservation / management of parks and gardens	7
		4. Information and communication technologies in LA	6
4	A. Instrumental	6. Knowledge of a second language	7
5	B. Interpersonal	4. Ability to work in an interdisciplinary team	8
6	C. Systemic	6. Leadership	6
7		7. Understanding of cultures and customs of other countries	6
8		10. Initiative to succeed and entrepreneurship skills	7

LA bachelor studies of the assessed programmes (Table 2). In Figure 4, the teaching methods that are used in the courses are presented. In most cases, more than one teaching method occurs in a specific module or course. For instance, a module on Urban open space planning is delivered as a studio in which students collaborate, which is combined with a series of lectures, some excursions and e-learning. For this reason, the percentage for each teaching method reflects the overall share of modules or courses that use this particular method for teaching. The analysis results show that studio learning, lectures and seminars, excursions, and internship are the most used teaching methods, while e-learning,

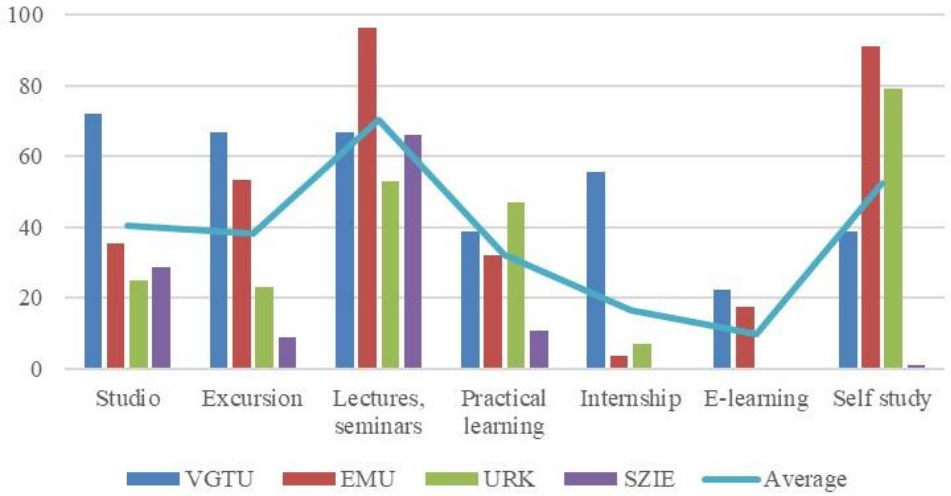

Fig. 4. Percentage of courses in which each teaching method is applied for all programmes. BArch 2017. [created by the authors]

TABLE 3

The share (%) of ECTS for teaching methods in LA bachelor studies for all assessed programmes [created by the authors]

No.	University programme	Studio	Excursion	Lectures, seminars	Practical learning	Internship	E-learning	Self-study
1	VGTU	**72,2**	**66,7**	66,7	38,9	**55,6**	**22,2**	38,9
2	EMU	35,5	53,5	**96,5**	32,0	3,5	17,4	**91,3**
3	URK	25,0	23,0	53,0	**47,0**	7,0	0	79,0
4	SZIE	28,6	8,9	66,0	10,8	0	0	1,0
	Average (%)	40,3	38,0	**70,6**	32,2	16,5	**10,0**	52,6

self-study and practical work are the least used teaching methods for VGTU BArch programme.

The results of the teaching methods assessment demonstrate that the programmes most frequently employ lectures and seminars as a main teaching method, while e-learning is least used – just 10 % of ECTS are taught by this method (Table 3). Studio, excursions and practical learning take the basic share of ECTS for LA teaching – 32 % to 40 %. There is a great variety of the used teaching methods between the different programmes. For instance VGTU teaches 72,2 % of ECTS by the studio method while URK – just 25%. Similarly, EMU has assigned 91,3 % ECTS for self-study while SZIE – just 1 %. A relatively small share of ECTS are acquired via e-learning so this might be considered a common issue where partner universities could join forces to develop more efficient material delivered by e-learning. On the other hand, studio and practical learning essentially comply with ECLAS requirements to cover 50 % or more of the whole study time. Quite unequal amount of self-study is an issue for some programmes (SZIE – %) that together with e-learning is considered a main pathway to individually constructed and self-managed education process [16].

The survey of the applied assessment methods shows that the poster presentation is the most frequently used assessment method; on the contrary, evaluating an essay is the least used. Inequality between the programmes is relatively great: SZIE uses test in 46,8 % ECTS and VGTU – 0 ECTS. VGTU requires a project diary in 66,7 % ECTS while EMU and URK – 0%. It is naturally understandable that theory courses are usually assessed by an exam or test, while studios mainly by poster presentations, project diaries with in some cases a sketchbook. The share of exams and tests as assessment methods may illustrate the share of theoretical part of the programme; that is the largest for SZIE and EMU; while poster presentations and project diaries can illustrate the practical teaching methods in the programme, that occur most frequent in VGTU and EMU.

The EBANELAS method appears an efficient tool for assessing individual study programmes and figuring out the gaps that the programme needs to fix based on the ECLAS guidance requirements.

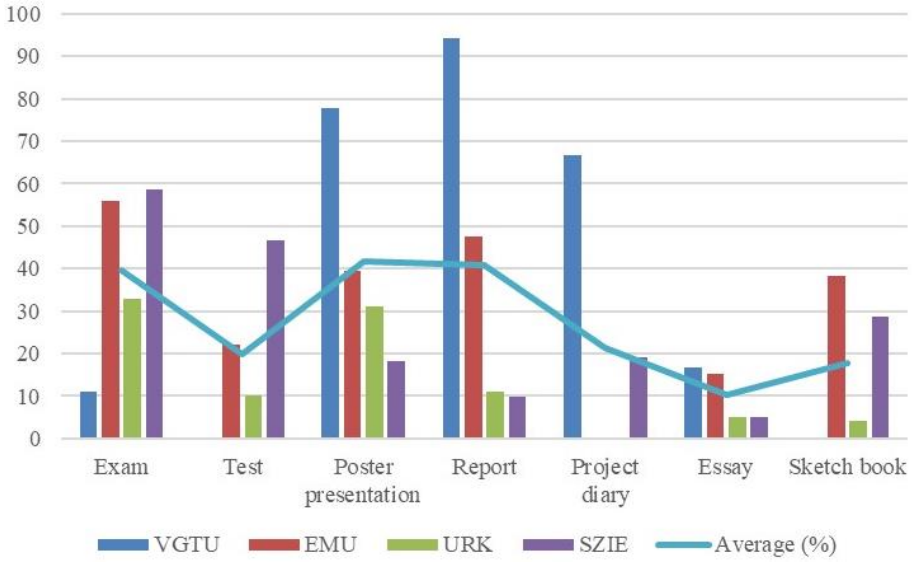

Fig. 5. Percentage of courses that use each assessment method for all programmes BArch 2017. [created by the authors]

TABLE 4

The share (%) of ECTS for assessment methods in LA bachelor studies [created by the authors]

No.	University programme	Exam	Test	Poster presentation	Report	Project diary	Essay	Sketch book
1	VGTU	11,1	0	**77,8**	**94,4**	**66,7**	**16,7**	0
2	EMU	55,8	22,1	39,5	47,7	0	15,1	**38,4**
3	URK	33,0	10,0	31,0	11,0	0	5,0	4,0
4	SZIE	**58,6**	**46,8**	18,2	9,9	19,2	4,9	28,6
	Average (%)	39,6	19,7	**41,6**	40,8	21,5	**10,4**	17,8

It also turns out to be efficient for assessing and comparing several programmes and identify the gaps in each of them (Table 1). More, it is efficient to figure out the gaps that are in common for the number of programmes in LA education. This feature has a wider European importance. First, because trans-national cooperation may help developing the commonly needed teaching contents – modules or supporting courses – for universities in Europe. In this case, it is indicated that for five programmes there is a need to upgrade the development of the eight competences listed in Tab. 2. Second, it may help building a completely new LA study programme that would be fully compliant with the ECLAS Guidance requirements. In this case, the EBANELAS method may act as a self-assessment tool while building and pilot testing the programme. Third, the methodology may help initiating a common training framework for LA studies in Europe by establishing an open network of the universities that run the LA study programmes that have been upgraded by the assessment results as demonstrated in this paper.

Conclusions

The common assessment methodology that is based on the internationally elaborated and agreed guidance requirements and recommendations enables the schools to carry out a self-assessment, improvement and benchmarking. The analysis of the present LA study programmes was performed in a group of five universities, and it has revealed the common gaps in LA studies that the schools confront such as developing entrepreneurship skills and ICT skills. Bridging these gaps requires an effort by the school's faculty which is challenging, time consuming and requires staff commitment and development. The group of collaborating universities or a defined network can share these tasks by jointly developing special study modules for the issues outlined by using the developed methodology. Other aspects that influence the quality of LA studies, such as the available staff or facilities and infrastructure (plant-assortment garden and ICT-studios), were not yet included in the

method. These could be added to the method or be part of a separate evaluation system to be developed.

ECLAS, IFLA Europe, EBANELAS and partner organisations and networks may offer a platform that initiates the collaboration and builds social capital for fostering better quality of landscape architecture education. The collaborative upgrade process may virally spread across the European continent as soon as the first universities go through the illustrated process and demonstrate the benefits. In addition, universities developing new LA study programmes may use this methodology for achieving high-quality teaching outcomes right from the start of the study programme. Certainly, staff should be psychologically and professionally ready to accept the required changes and lead the study process forward, and by doing that, a country or a region may develop a common strategy for the whole education sector.

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Jeroen de Vries (1953) is a dedicated landscape architect with a mission to foster the professional and academic quality of the discipline. Combines vision and innovation with management and sustainable support of organisations. In groups and projects acting as the driving spirit: structuring, organising discussion, guiding decision making, supporting colleagues, and editing and implementing the outcomes. He graduated as a landscape architect of Wageningen University with a specialisation in landscape design and ecology. A landscape architect registered by law, member of the NVTL and ECLAS, and an international member of ASLA. Currently affiliated with the LE:NOTRE Institute.

Kopsavilkums. Ņemot vērā nesenās vides un sociālekonomiskās problēmas, ar ko saskaras mūsdienu pilsētu reģioni, tiek padziļināti pētīta izglītības kvalitātes ietekme. Tiek veikts vēl viens solis praktiskām darbībām, kas vērstas uz augstākās izglītības pārveidošanu Eiropā. Ainavu arhitektu mācību kvalitāte tiešā nozīmē ietekmē profesionālo pakalpojumu kvalitāti un to ieguldījumu pilsētu publisko telpu, kultūras mantojuma vietu un objektu, parku, dārzu un infrastruktūras projektēšanā, plānošanā un vadīšanā. Plašas ainavu arhitektūras (LA) studiju programmas visā Eiropā nodrošina izglītību, kas atšķiras pēc darbības jomas, satura un kvalitātes.

Divas Eiropas ainavu asociācijas - Eiropas Ainavu arhitektūras skolu padome (ECLAS) un Starptautiskā ainavu arhitektu federācija (IFLA) izstrādājusi ainavu arhitekta izglītības vadlīnijas. Tās attiecas uz vides, mākslas un inženierzinātņu kompetenci un prasmi. Attiecībā uz IFLA prasībām, tiek veidota studiju programmu profesionāla atzīšana. ECLAS vadlīniju ziņojumā (2010) galvenā uzmanība tiek pievērsta tematiskajām un vispārīgajām kompetencēm, kuras studentiem vajadzētu apgūt izglītības procesā. Minētās studiju vadlīnijas ir vērstas uz pašreizējo ainavu arhitektūras studiju kvalitātes uzlabošanu, turklāt tas tiek izmantots, lai izstrādātu vienotu instrumentu, un lai varētu novērtēt ainavas arhitektūras izglītības kvalitāti Eiropas universitātēs. Novērtējuma rezultāti parāda analizēto studiju programmu un mācību priekšmetu stipro pusi un nepilnības. Izpētes rezultāti sniedz skaidru priekšstatu par skolām, kurās jāuzlabo mācību moduļi un kursi, kā arī lai izpildītu kopējās prasības. Tajā pašā laikā šo metodi izmanto, lai turpinātu un attīstītu katras universitātes studiju programmas stiprās puses. Apskatot plašāk LA izglītību Eiropā, ainavu arhitektūras mācību priekšmetu specifiskā kompetence tiek tālāk attīstīta, papildinot jaunākos atzinumus, ko piedāvā iesaistītās universitātes un profesionālās asociācijas.Autori ir novērtējuši ainavu arhitektūras studiju programmas un priekšmetus piecās Eiropas universitātēs: Van Hall Larensteina Lietišķās zinātnes universitāte, Nīderlande (VHL); Lauksaimniecības universitāte Krakovā (URK), Polija; Szent István Università Budapest (SZIE), Ungārija; Igaunijas Dzīvības zinātņu universitāte (EMU) Tartu, Igaunija; un Viļņas Gediminas Tehniskā universitāte (VGTU) Lietuvā. Iegūtie rezultāti tika analizēti un apspriesti. Aptaujā tiek izmantotas akadēmiskās un profesionālās prasības LA izglītībai, kuras izstrādāja un pieņēma ECLAS un IFLA Europe 2008.-2014. gadā. Rezultāti tiek apkopoti, lai pārskatītu un grozītu vadlīniju dokumentus.

Katrai studiju programmai tika atrasti moduļi vai studiju programmu kopējā daļa, kas veido noteiktas kompetences, un, pamatojoties uz to, tika noteikts minimālais slieksnis. Tika izveidota 50 % robežlīnija, kas norāda akadēmiskajam personālam nepieciešamību studiju programmas uzlabošanā, lai atrisinātu jauno speciālistu kompetences līmeni. Minimālais slieksnis katrai studiju programmai ir atšķirīgs, tāpat kā vidējā moduļu vai kursu daļa. Pētījuma grafiskā sadaļā ir norādīti moduļi vai kursi, kuru kvalitātes līmenis ir zem sarkanās līnijas. Pētījumā ir nolasāmas studiju jomas, kuras universitātēm vajadzētu uzlabot.

Šajā rakstā sniegta metode, kā novērtēt kvalitātes aspektus, kas saistīti ar kursa saturu un studiju procesu. Tajā pašā laikā šī metode izmantojama, salīdzinot pašreizējo studiju programmu, priekšmetu struktūru un apjomu, lai tas atbilstu kopējām Eiropas prasībām ainavas arhitektūras studijās. Pētījuma mērķis ir pārbaudīt izstrādātās metodes efektivitāti un pielietojamību, to īstenojot ainavu arhitektūras studiju programmās. IFLA harta nodrošina ainavu arhitektūras izglītības galvenos mērķus un uzsver vajadzību pēc apmaiņas programmām starp pasniedzējiem un studentiem augstākajā līmenī.

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Creativity and Ecology: A Decade of Contributions for the Design of Sustainable Landscapes (1999-2010)

Paula Gomes da Silva, *Linking Landscape, Environment, Agriculture and Food Research Unit/University of Lisbon; University of Algarve, Portugal*

Abstract. Ecology has contributed significantly to the evolution of landscape architecture. Currently, ecology continues to have a very significant role in the practice of landscape architecture. Nevertheless, several authors have identified limitations on the knowledge transferal process and on its application by landscape design professionals. This research analysed theoretical criticism on landscape design between 1999-2010, identifying it's legacy in the use of ecological concepts for the development of conceptual and formal design strategies. Were collected and analysed a set of 15 documents on landscape architecture design theory, including books, chapters and essays, mostly related with the landscape urbanism movement. The purpose was to identify the ecological concepts that were used and the way they worked in the design. This study also covered how the use of concepts changed over time. The analysis of the literature recorded the use of 23 ecological concepts and several proposals to its operationalization. The concepts identified fell within two trends: the articulation between form and process; and the adaptive capacity of the design. This paper argues that the theoretical contributions produced between 1999 and 2010 point to meaningful ecological operations from which innovative design approaches, that integrate ecology, can be explored.

Keywords: ecology, Creativity, Landscape urbanism, Landscape design

Introduction

Ecology, field of knowledge of the natural sciences, has been present in landscape architecture since its foundation, and has contributed significantly to the evolution of the profession [1]. Currently, ecology continues to have a very significant role in the practice of landscape architecture, and in the evolution of the theoretical discussions that ground it. In addition to its contributions to scientific knowledge, ecology plays a mediating role in the thinking models that frame the relationship between human beings and nature, and which are embodied in landscape design.

Scientific knowledge is embedded itself in the constructive dimension of landscape designs. Nevertheless, several authors have identified limitations on the knowledge transferal process and on its application by landscape design professionals, such as landscape architects [2; 3]. For ecologists there is a lack of conceptual mechanisms that facilitate the incorporation of ecological knowledge into the production of design solutions [1]. In addition, they report that there is no monitoring process for the actual designs carried out, which evaluates the effectiveness of the implemented solutions [2; 3; 4]. On the other hand, designers have recognised the limitations of a straightforwardly instrumental use of ecology by design. They propose instead that, ecology should play a creative and active part in the production of ideas and conceptual frameworks for design [5; 6; 7; 8].

Recently, several authors acknowledge that in last decades the practice of landscape design has been engaged in the development of new approaches that copy the capacities of continuous adaptation and self-organization of ecological systems in a creative way [8; 9; 10]. Landscape design is a multidimensional practice that involves social, aesthetic and symbolic aspects, in addition to environmental ones [10]. That means ecology should not only play an instrumental role in landscape design.

The first decade of the twenty-first century (1997-2010) was extremely productive in the development of possibilities for the integration of the knowledge of several subfields of ecology in landscape design [8; 9; 10]. Under the umbrella of the landscape urbanism movement, innovative hybridization approaches, between natural and technological systems, attempted to introduce, in theory and practice, concepts and models that were being developed in urban ecology, landscape ecology, and systems ecology. Several of these contributions had the clear intention to act as theoretical support for the action [10].

This paper argues that a detailed and structured analysis of this literature and its contribution to the transference of ecological knowledge to design is fundamental. With this purpose this research analysed critical theory, identifying trends in the use of ecological concepts and discussing how these were used for the development of conceptual and formal design strategies. The objectives of this research were: (1) to understand which ecological concepts was fundamental to landscape design and planning; (2) which ecological concepts were used by landscape design; (3) to understand how all these concepts contribute to the development of conceptual and formal strategies.

Methodology

Discourse analysis was the core research methodology used here since the research focused on explaining the content and underlying meanings attached to discourse [11]. I chose this method based on the assumption that theoretical discourse and design practices are articulated in dialogic ways; that is, each one reflects aspects of the other. The documents included essays taken from critical collections and articles published in academic journals. This sample was collected in two stages. Firstly, were identified concepts that ecology (landscape ecology and urban ecology) considers relevant for design. Afterwards, was selected and analysed critical literature produced within the field of landscape design theory between 1997-2010 and which focused on the aforementioned ecological concepts.

Ecological Concepts relevant to Landscape Design and Planning

Ecology has produced an extensive set of theoretical concepts. The research was narrowed by putting in place chronologic and thematic criteria. I chose to consider specifically only the concepts that were developed in relation to contemporary ecology (chronological criteria) and which had as their main focus landscape design applications (thematic criteria). For consistency purposes in relation to the set of bibliography on landscape design theory, I only looked for ecological literature produced in the similar chronological period. Were analysed 4 articles, 3 book chapters and 1 whole book, all written between 1996 and 2013 [2,*12–18*]. The documents were read in full in order to identify the relevant ecological concepts and principles used.

As result of this task, were identified and grouped concepts related to three aspects of contemporary ecology (Table I). In the first group, were identified concepts linked to the idea of *system and non-equilibrium*; including Open system, Complex system, Ecosystem. In the second group, were included the concepts and theories related to *system openness*; such as Scale, Context and Hierarchical theory. In the third group, were integrated the concepts related to the relationship between *Process and landscape patterns*. Among these, were listed the process; the Patch-corridor-matrix model, developed by landscape ecology; the Spatial pattern; Connectivity; Fragmentation; and the Theory of island biogeography.

Selection of relevant design theory literature

The selection of relevant design theory bibliography was based on the set of authors/designers identified by Meyer (2008), Steiner (2011) and Thompson (2012). These designers used ecological processes and operations as the conceptual basis for their designs, and support their strategies in contemporary ecological theories. The lower temporal limit of the survey was marked in 1997, which corresponds to the year of the foundation of the landscape urbanism movement [10] The initial set of documents was analysed and extended through the chain sampling method. It's important to note that landscape designers usually don't publish their reflections on design in academic journals which places these documents outside the most important citation databases.

Have been chosen documents which included more than one ecological concept (previously identified), and that discussed the potentialities, possibilities or problems arising from their practical use. The bibliographic collection was limited by implementing the saturation principle. That is, the moment when new ecological concepts were no longer surfacing in critical documents. Was established that a larger number of documents than those actually collected would be detrimental for the purposes of this research.

Based on the criteria already mentioned, was collected a set of 15 reference documents on landscape architecture design theory, including books, chapters and essays mostly published on professional journals (Table II). The selected bibliography was published between 1999 and 2010.

Even in this relatively short period of time, were observed significant changes to ecological concepts and to the ways these were translated into design practice. I studied extensively the selected bibliography, with the purpose of identifying the concepts that were used and the way they worked in the design.

Results: Ecological Concepts on Contemporary Landscape Design Discourse

The analysis of the 15 documents allowed the identification of 23 ecological concepts, listed in descending order of occurrences (was considered as an occurrence the mere mention in the text and not the number of times the concept was mentioned) (Table III). The concepts were then compared to those collected by the field of ecology research (Table I) and were reorganised into four thematic groups: (I) *Complex System*; (II) *Open system*; (III) *Relationship Process/structure*; (IV) and *Dynamics of the system*. Group IV was the category that recorded the largest number of concepts (8) and occurrences (47). Group II registered the smallest number of occurrences, 19 only, for the 3 concepts identified. Groups I and III were in the middle.

From all the concepts analysed, *Process* registered the greatest number of occurrences overall. It was mentioned in 13 of the 15 documents studied (87 %). A few concepts occurred more than 50% of the time:

TABLE 1

Ecological concepts relevant to landscape design and planning [created by the author]

#	Dramstad and all 1996	Pulliam & Johnson 2002	Karr 2002	Johnson & al. 2002	Pickett & al. 2004	Hill 2005	Lister 2007	Ahern 2013
Systems and non-equilibrium								
Open system, complex system, ecosystem	•	•	•	•	•	•	•	•
System's history		•		•		•	•	
Multiple steady state					•	•	•	
Ecological succession		•			•			
Perturbation		•		•		•		
Resilience			•	•	•	•	•	•
Adaptation, Self-organization, Emergence				•				•
Ecological memory								•
Open systems								
Scale	•	•	•	•			•	
Context		•	•	•			•	
Hierarchical theory		•		•				
Pattern and process								
Process	•		•	•	•	•		
Patch-corridor-matrix model	•			•				
Spatial pattern	•		•	•	•	•		
Landscape heterogeneity					•	•		
Connectivity, Fragmentation	•			•				•
Biodiversity								•
Island biogeography	•	•						

System/Ecosystem (12, 80%), *Adaptation / Self organisation* (11, 73%), *Complexity / Dynamics* (10, 67 %), *Context* (10 occurrences, 67 %), *Open-ended* (9, 60 %) and *Emergency* (8, 53 %). The groups shared evenly the most frequent concepts, with the exception of group II (*System opening*), which included the less cited concepts. The concepts less frequently used were *Boundaries/Limits* (2, 13 %) and *Spatial pattern*/*Heterogeneity* (1, 7 %).

Besides concept frequency and categorisation, this study also covered how the use of concepts changed over time. As the number of documents varies according to the year studied, this discrepancy was minimised, by counting one occurrence only, on those years when more than one document was published. For the time period studied (1999-2010), three concepts were mentioned repeatedly: *System / Ecosystem* (7 / 11), *Context* (6 / 11) and *Process* (7 / 11). The concepts grouped in sets I and II did not show any identifiable trend, and occurred nearly every year. The concepts grouped in sets III and IV behaved differently nevertheless. Was detected an incremental tendency in groups III and IV. These concepts became more frequent after 2004. The growing trend in the use of the *Relationship Process/structure* and the *Patch-corridor-matrix model* was particularly interesting to landscape design. From 2007 onwards, the use of *Resilience* emerged as another trend.

Discussing Modes of working Ecological Concepts into Landscape Design: 1999-2010

Landscape and Design as a Complex Open System

System/Ecosystem was one of the concepts most frequently used. I believe the steady reoccurrence of this concept throughout the time scale analysed here was due to the fact that it works like a paradigm, encompassing all other concepts. In the selected bibliography, whenever system was cited, it always referred to the notion of complex system [18; 23].

System was used to designate either the intervention area or to qualify the design itself. In the first case, the intervention area was understood as a complex reality, described as a field of interactions between natural and social components, and affected by the passage of time [18; 19; 21; 23; 24]. In the second use, system referred to the reality produced by

TABLE 2

Selected literature [created bu the author]

Author	Date	Title
A. Berrizbeitia	1999	The Amsterdam Bos: The Modern Public Park and the Construction of Collective Experience
S. Marot	1999	The reclaiming of site
A. Berrizbeitia	2001	Scales of Undecidability
G. Davoine	2003	In Conversation with Michel Desvigne: Intermediate landscapes
J. Corner	2004	Not unlike life itself
J. Corner	2006	Terra fluxus
J. Czerniak	2006	Looking back at landscape urbanism: speculations on site
C. Waldheim	2006	Landscape as Urbanism
J. Corner	2007	Proceso
G. Hargreaves	2007	Large Parks: A Designer's Perspective
A. Berrizbeitia	2007	Re-Placing process
N. Lister	2007	Sustainable Large Parks: Ecological designers or Designer Ecology?
L. Pollak	2007	Matrix landscape: construction of identity in the large park
J. Czerniak	2007	Legibility and Resilience
C. Reed	2010	The Agency of Ecology

TABLE 3

Occurrence of ecological concepts in the documents analyzed [created bu the author]

Ecological concepts	N	%	N Occurrences/group
I. Complex system			
System/Ecosystem	12	80	
Complexity/Dynamics	10	67	
Uncertainty/ Indeterminacy	6	40	28
II. Open system			
Context	10	67	
Scale	7	47	
Boundaries/Limits	2	13	19
III. Relationship Structure/process			
Process	13	87	
Open-ended	9	60	
Patch-corridor-matrix model	7	47	
Relationship Structure/process	4	27	
Spatial pattern / Heterogeneity	1	7	34
IV. System dynamics			
Adaptation/Self-organization	11	73	
Emergency	8	53	
Autopiesis/Structure and organization	7	47	
Ecological succession	5	33	
Diversity	4	27	
Systems' history	4	27	
Disturbance	4	27	
Resilience	4	27	47

the act of designing (the design). The analysed literature argue that contemporary design must take on the traits of a complex open system. That means, contemporary design must be able to deal with complexity and uncertainty. It must be proactive. Design should integrate from the outset diverse ecological and social components. It should also be capable of integrate future changes (e.g. ecological conditions, spatial and formal organisation, program of activities) [19; 25].

Most authors abandoned therefore the idea of design as a finished object [18; 19; 21, *24–29*]. This new understanding demanded novel approaches to the design. The drawing of shapes (configurations) was replaced by the design of processes [29]. The remaining concepts identified were related to characteristics and/or the properties of a complex open system.

Connecting process to structure - processes generate forms

The concept of *Process* (group II) was the most frequently cited. In the field of systems ecology, process is core, which explained its dominance here. Due to this change of perspective, design became centred on the mechanisms of landscape functioning and on the relationships between the elements, rather than on the elements themselves [19; 21].

TABLE 4

Occurrence of ecological concepts by analyzed literature [created by the author]

Ecological concepts	Berrizbeitia 1999	Marot 1999	Berrizbeitia 2001	Davoine 2003	Corner 2004	Corner 2006	Czerniak 2006	Whaldheim 2006	Corner 2007	Berrizbeitia 2007	Hargreaves 2007	Pollak 2007	Lister 2007	Czerniak 2007	Reed 2010	N Occurrances
I. Complex system																
System / Ecosystem		1	1	1	1	1	1	1	1	1			1	1	1	12
Complexity / Dynamics		1	1		1				1	1	1	1	1	1	1	10
Uncertainty / Indeterminacy			1	1	1	1		1					1			6
II. Open system																
Context		1	1	1	1	1	1			1	1	1	1			10
Scale						1	1			1	1	1	1	1		7
Boundaries / Limits		1										1				2
III. Relationship Structure / process																
Process	1	1	1	1	1	1	1	1	1	1	1	1			1	13
Open-ended	1	1			1	1		1		1	1			1	1	9
Patch-corridor-matrix model					1	1			1	1	1	1		1		7
Relationship Structure / process					1	1	1		1							4
Spatial pattern / Heterogeneity												1				1
IV. System dynamics																
Adaptation / Self-organization			1		1	1		1	1	1	1	1	1	1	1	11
Emergency			1		1				1	1	1		1	1	1	8
Autopiesis / Structure and organization			1	1	1	1			1	1	1					7
Ecological succession	1				1			1		1					1	5
Diversity									1		1		1	1		4
Systems' history		1								1	1		1			4
Disturbance										1		1	1	1		4
Resilience					1							1	1	1		4

When the focus on process began, the form and composition were given secondary roles. A design was to be conceived as a process, and its aesthetic value laid, not in its appearance, but in the transformative acts it favoured [31; 32; 35]. The rejection of formal composition posed nevertheless practical problems for the professions, like landscape architecture, that use form as a tool for design. It was only after some reflection that the solution to this problem emerged from the theory of Landscape Ecology. According to this discipline, landscape could be described using the same three elements that make up any system: structure; function and change [35]. Other core principles of landscape ecology included interactions between landscape patterns and their processes [3; 31; 32]. From 2004, some of the analysed documents argue that this interdependence is crucial to landscape design, recognizing that any change to the organisation and spatial configuration of a landscape will necessarily impact (positively or negatively) its processes [21; 33].

The emphasis that landscape ecology puts on process contrasts with its observed low occurrence in our selected bibliography. The change occurred in 2004 when concepts and models started to be frequently referenced. From this date onwards, were found recurrent mentions to the relationship between *Structure/Process* [21; 22; 25; 34] and the *Patch-corridor-matrix model* [19, *21–23*; 28; 33]. I believe this change has signalled a greater openness by designers to the contributions of landscape ecology.

The relationship between configuration (structure) and process allowed design to reject considering one over the other. Hence, the dialectical relationship between these two components of the landscape would prevail over the understanding which considered them as dichotomies [21; 22]. The compatibility between process and design was made easier by the idea that the physical configuration - shapes and materials - supported the flow of the process. The reciprocity of this relationship indicated that, in addition to forms influencing processes, processes generated forms [21; 22; 34]. Thus, it became possible for landscape design to reconcile the attention given to process alongside configuration by asking the following two questions: What configurations sustain the processes that the design wants to promote? What spatial organisations (what configurations) are generated by processes?

Design is an Adaptive System

One of the most commonly discussed notions in the literature was the ability for *Adaptation/Self-organisation*, typical of living systems. From the analysed bibliography I argue that the discussion of adaptation (self-organisation) was centred around two ideas. First was recognized that the design should have the capacity to evolve and adapt to changes that may occur on ecology, society, economy, politics, or other [7; 13, *24–30*; 32; 34; 39]. Second the design should be able to produce its own material and programmatic components (e.g. habitats, vegetation, soil, or programmatic events) [19; 26; 28; 29]. Were identified three ecological concepts relevant to this discussion: *Disturbance*, *Emergency* and *Resilience*.

Disturbance is a key component of adaptation. It is the way a system reacts to disturbance that triggers the self-organising mechanism [35]. While disturbance was not one of the most mentioned concepts in the bibliography, it was mentioned by some of the authors. Discussions emphasised the need to improve, from the very beginning, the capacity of a design to integrate evolution and changes in response to disturbance, by establishing key elements and processes [18; 19; 23; 33]. Disturbance could be read here as a positive component; as long as it was associated with a strategic vision and a flexible proposal capable of absorbing it, even if partially. On the other hand, recurrent disturbances, identified in the analysis stage (e.g. floods, fires or lack of financing for maintenance work), could be incorporated into the design and even used as ways to improve a proposal with novelty and surprise [6].

Emergency is a fundamental property of living systems as it relates to the process of adaptation. Despite this, it is not frequently mentioned or commented on. It may be that designers' limited knowledge of the role that emergency plays in the adaptive cycle explains this small footprint. As a system evolves, emergency can be found in ecosystems whenever new species, communities, habitats and ecological processes of increasing complexity emerge [36]. In socio-ecological systems, emergency leads to the appearance of new institutions, ideas and / or policies [37]. In the literature reviewed, emergency's influence was positively perceived [21; 22; 28; 29]. It was claimed that designs should be designed as facilitators of ecological and programmatic emergency processes [19; 20; 23]. Emergency was most commonly mentioned here in relation to ecology. In this context, the capacity of self-production was explored through the stimulation of ecological succession, leading to the appearance of new habitats, species of vegetation and fauna, as well as the improvement of existing pedological or hydrological resources [18; 19; 20; 28]. One advantage of emergency is the reduction of implementation costs. The disadvantage is that the construction process would be more time-consuming. This could become a positive aspect, if it allowed a greater community involvement as the design developed. Another favourable outcome would be the possibility of monitoring the results, and the subsequent incorporation of this knowledge in the process of design implementation [7, *24–2*; 33; 39].

Finally, *Resilience* is a concept that has become more frequent at the end of the analysed period and is currently recognised as an important component of the adaptation process of complex systems [8]. It is related to the persistence capacity of a system, which has the ability to adapt itself without losing any of its essential characteristics [39].

In landscape design, resilience demands a balance between the potential for change and the need for persist [8]. Change is an essential condition for the survival of a design. On the other hand, continuity ensures the preservation of a design's identity [19; 20; 21]. The analysed literature also highlights this concern and proposed solutions for it. In order to resolve this apparent contradiction, Berrizbeitia [20] drew on the differentiation between structure and organisation developed by Autopoietic Theory. According to Autopoietic Theory, systems can be organisationally closed (identity) but structurally opened (renewal). When applied to the design, this means the design would consider structure and organisation separately [20; 21]. The analysed literature propose two design strategies to put this idea into practice. One way of doing this would be to design a recognizable formal configuration (circle, rectangle, square, grid), which, in articulation with the paths, would ensure the most enduring aspect of the design. The areas not included in this component would be freer to separately pursue programmatic and material evolution. A second way of introducing design flexibility would be to create several structures - relatively autonomous - so that changing one of them would not spur changes to all (layering) [23].

Conclusion

This research verified that the critical literature produced between 1999-2010 recorded and reflected about important innovations that were being experimented in landscape architecture of those days in relation to the transference of ecological knowledge to design.

The 23 ecological concepts recorded, allowed to conclude that designers were reasonably up to date. The majority of concepts highlighted by ecology theory were also found in the criticism and practice of landscape design. Also, there were no significant inconsistencies observed, when comparing the way in which concepts were used by design theory and ecology.

The analysed authors understand project as a complex open system. Accepting this idea was fundamental, as it allowed for a connection between ecological sciences and landscape design. The former offer content and procedures, which were used by the latter in the development of design strategies. The concepts identified fell within two trends: the articulation between form and process; and the adaptive capacity of the design. Regarding contributions made by ecological disciplines, the three fields of research most prominent were systems ecology, landscape ecology and urban ecology.

Although almost 10 years have passed on these contributions, it can be affirmed that the ideas underlying the discourses analysed are still up to date and their potential has not yet been fully explored. On this last idea the research noted that the use of concepts still falls short, as each of them could contribute more creatively and generate a greater articulation between ecology and landscape design. Was also found that no aspects recorded related to the monitoring of successes or problems arising from the implemented design strategies.

It's true that, as argued by ecology studies, is still difficult to transfer the scientific knowledge produced for the design and planning. Landscape architecture is not a science and the best way to access scientific and adequate knowledge is promoting the integration of ecologists into design teams, like some of the projects described in the literature have done. This allows designers to apply the scientific developments produced in science to landscape design, and also enables ecologists to learn from the design, by monitoring the actions taken.

Ideas to reformulate the relationship between ecological and social systems are increasingly needed to face the challenges posed by climate change, biodiversity loss and key resources scarcity. This paper has shown that the theoretical contributions produced between 1999 and 2010 are still relevant nowadays. It also argue that they should be further explored by landscape architects and ecologists, since they point to meaningful ecological operations from which innovative landscape design approaches, that integrate ecology, can be explored.

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Kopsavilkums. Ekoloģija ir būtiski veicinājusi ainavu arhitektūras attīstību. Ekoloģijai joprojām ir ļoti nozīmīga loma ainavu arhitektūras praksē. Tomēr vairāki autori ir noteikuši ierobežojumus zināšanu nodošanas procesam un tā piemērošanai ainavu dizaina speciālistiem. Līdz ar to, pētījumā analizēta teorētiskā kritika ainavu dizaina jomā laika posmā no 1999. līdz 2010. gadam, identificējot to kā mantojumu ekoloģisko koncepciju izmantošanā un dizaina stratēģiju izstrādē. Pētījumā aptverti un analizēti 15 ainavu arhitektūras dizaina teoriju dokumenti un materiāli, tostarp grāmatas, nodaļas un esejas, kas galvenokārt saistītas ar urbanizētu ainavu. Pētījuma mērķis: identificēt izmantotos ekoloģiskos jēdzienus un virzienu, kādā tie strādāja ainavu dizainā. Iegūto materiālu analīzē tika fiksēti 23 ekoloģiskie jēdzieni un vairāki priekšlikumi to ieviešanai. Identificētie jēdzieni ietilpst divās tendencēs: formas un procesa sakārtošana un dizaina jauda. Rakstā tiek apgalvots, ka teorētiskais ieguldījums, kas veikts laikā no 1999. līdz 2010. gadam, norāda uz nozīmīgām ekoloģiskām darbībām, no kurām var izpētīt inovatīvas dizaina pieejas, kas integrē ekoloģiju.

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Developing a Mixed Method for Testing a Theory on Spatial Aesthetics

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Abstract. The goal of this article is to find a mixture of methods to test a theory on spatial aesthetics. The theory in question is based on findings in evolutionary aesthetics and it states that there are four categories of spaces, both, urban and natural, each having a particular size measurable in meters. Besides that humans attach a certain level of preference to each of these categories. Theoretically a sufficient amount of mystery and legibility elements can improve the preference. As literature suggests the most appropriate way to test a theory is to carry out semi-structured interviews in order to find relevant information that extends and confronts the theoretical frame. In situ interviews with the inhabitants of three residential areas in Riga were carried out to test the above described theoretical construct. The aim of the interviews was to test the theory in three relevant points: perceived size of a scene, preference of a scene and the presence of mystery and legibility elements in a scene. A pilot study has shown that the first two of the points received sufficient answers in the interviews. Yet, the third one did not obtain enough information for further analysis. To fix this deficit an expert visual investigation is carried out as a complementary method to the discursive interview analysis executed before. Expert visual investigation means that the researcher investigates the objects mentioned or showed at by the interviewees in the attempt to find any hints to the presence of legibility and mystery elements in them. This method permits to escavate information on leginbility and mystery from the interviews by using the expert as an interpreter. The article questions the possibility to receive relevant information from the interviewee on very specific, theoretical concepts that are not common knowledge. This paper proposes to use a mixed method in order to completely tackle the issues of such a specific interest.

Keywords: urban space, spatial aesthetcis, semi-structured interviews, mixed method

Introduction

In a theory of environmental psychology spaces of particular sizes and configuration are preferred over the spaces that do not have the sizes and configurations [1; 5; 13]. Depending on size and proportion, spaces are grouped in four different categories. The open-undefined space is highly disliked, enclosed space and blocked views are not preferred, too. Whereas spaces belonging to the category spacious-well-structured are liked by humans [8]. It has been established in our previous research that not only walls of the buildings as traditionally proposed, but mainly smaller objects like trees, benches or roads are able to serve as a border of perceived urban space and thus determine its size, elements and according category [10]. Moreover, we have argued that a higher number of legibility and mystery elements impact the preference of a space – disliked space can become a tolerated one if there is a sufficient number of these elements [10]. Mystery is a type of prospect – the opportunity to see into the environment – which promises more information into comparison to what is visible from the current stand point if one walks into this prospect. Legibility is type of refuge – an opportunity to hide and see a part of a space not fully visible from the current stand point.

Until now we have mainly emphasised the role of the *in situ* interviews in testing the above described theoretical assumptions. Semi-structured interviews brought a lot of material on size and preference of space. Interviews also implicated that the inhabitants see and evaluate such spatial elements as mystery and legibility, even though they never mentioned them directly. Luck of such direct reference shows that one method only – the interviews – is not sufficient to acquire all the needed information. The goal of this paper is to describe a complementary method that was used to utilise the information collected via interviews in order to gain understanding on how humans perceive legibility and mystery elements.

Materials and Methods

Deficits of Collected Materials

The general aim of my research is to contribute to the discussion about evaluation of spatial aesthetics. Scientist of environmental psychology offer in few papers metric information on most preferred spaces, both, yards and streets [1; 5; 13]. We have assembled this metric information and calculated the missing values. As a result new Model of Measurements of Spatial Aesthetics was established [9]. This theoretical model serves as a base to evaluate every urban space as it is formed by the walls of buildings: to determine its category by analysing its wall-to-wall size and presence of mystery and legibility elements. The utilistion of this approach has already been described [10]. Yet, since the model was established on theory based on *ex situ* collected empirical data, it was decided to carry out semi-structured interviews to test this theory. Closer information on the choice of interview method is given elsewehre [9].

A small pilot-study carried out in Riga in 2014 discovered that semi-structured interviews do provide a large amount of relevant information. The inhabitants in the interviews talked about particular scenes and also indicated were the yard or street in question had its borders. Mapping the interviews is known to be a handy tool for imagining the size of the space someone describes [12]. Such maps were executed. Also the reported preference of each space was mapped. Such maps were then compared to the previously created maps that used Model of Measurements of Spatial Aesthetics. Every scene – a yard or a street – was depicted on an *aerial photography* with two layers. The first layer showed the size and configuration of the space as predicted by theoretical approach. The second one – the size and the preference of the scene as described by the inhabitants. There was enough information in these two layers to realize that they show a difference in perceived size and preference of urban space. Comparing theoretical and perceived sizes – component relevant for detecting a category – was possible. Yet, the crucial element for understanding the preference, i.e., the presence of mystery and legibility elements was not clear.

The problem that the interviews did not tackle – inhabitants did not address either mystery, or legibility issues directly. It was established that decoding interviews is not enough. In the case of this research the problem was not the usual lack of so called data saturation or sample size of semi-structured interviews [3, 4]. The deficit seemed to be impossibility to test the theory by discursively analyzing a qualitative interview data only, since inhabitants interviewed were layman, who were not familiar with the concepts of legibility and mystery. I decided to purposefully not ask about these concepts, since it would have pushed people into answering out of mere willingness to help. Such data would be "positively misleading" [15].

Finding Complementary Method

The debate on usage of mixed method in humanities is not new anymore. Two types of data collection procedures are a classical example of mixed method [2; 14]. It truly seems that using a supplementary approach next to discursively analyzing the interview material does prove the understanding of the object of research – spatial aesthetics. Thus, the question is relevant – how else data can be collected from the interviews in order to produce meaningful results.

The interviews provided lots of material which proves that humans think in the terms of legibility and mystery. Inhabitants talk about the need for better visibility at the same time staying unnoticed or advantages of seeing further than the current space provides. The former is a description of legibility, the latter – of a mystery. The most adequate way to preserve the information given by the inhabitants and extract the needed knowledge at the same time is a supplementary visual investigation of the space. It was conducted by the researcher.

In short, another method was utilized – expert visual investigation, in which data collection was based on interviews, yet, the expert researcher took a large role in interpretation of this data. The material objects mentioned in interviews such as "trees", "playground", "road" etc. that seemed relevant in terms of determining size or preference were written down in a form of a scripts. Similar objects were grouped in one script. For instance, all the interviews that mentioned trees in a particular scene were registered in one script etc.

The researcher then examined scenes yet for another – third time. Every scene which was labelled with "trees", for instance, received a detailed description of the trees in the scene. For example, how many trees are there? What kind of trees are there? How old are the trees? Are trees standing singularly or forming groups? What is the form of trees? What is the length of trees? What is the trunk radius? Can this tree be considered an element producing mystery or legibility? The same procedure was applied to other material objects that interviewees indicated as the ones creating border of a space at hand or being relevant for the like or dislike.

Such an approach where the researcher is interpreting the material objects into prospects and refuges has already been used before. It is especially popular in environmental psychology [6; 11; 16]. But also art and architectural historian Hildebrand has published few works where he served as an expert and explained the built environments from this point [7]. Yet, the important innovation is that the proposed expert visual investigation method is selecting for the analysis only those objects that are named by the interviewees.

Results and Discussion

By carefully analyzing the physical objects mentioned by the interviewees a new empirical data appeared that gave information on how objects such as trees, elevations, playgrounds, benches, also walls etc. contribute to perceiving urban spaces in terms of the presence of mystery and legibility in them. For instance, positive mentioning of small elevations of earth can be brought in connection with legibility, if the interviewee is referring to such an elevations as points where the yard can be safely observed from. To the best of my knowledge the interviews have never been used before as the description of relevant objects in nature that determine legibility and mystery elements. Thus, there is no comparison to the previous research available.

Fig. 1. Size, preference and mystery elements in a yard in Āgenskalna priedes as estimated by visual analysis. The size of the yard is shown by dark field. Black arrows with white outline show mystery elements formed by gaps between buildings. Human symbol shows the standpoint [created by the author]

Fig. 2. Size and preference of a yard in Āgenskalna priedes as estimated by the interviewees. The white field determines the borders of the space that extends "until the trees", and some interviewees call it "their yard." The light color indicates that the interviewees tolerated the yard [created by the author]

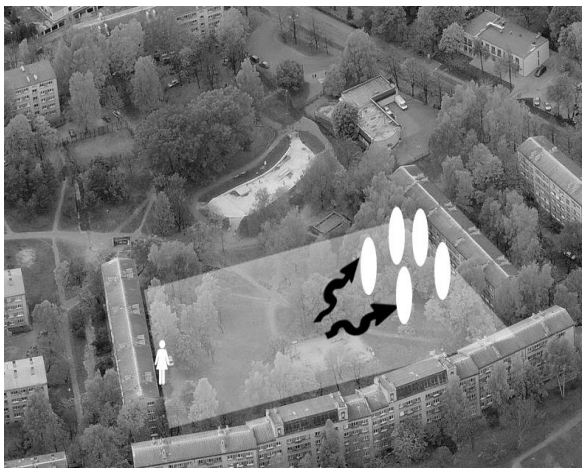

Fig. 3. Mystery elements and legibility elements in a yard in Āgenskalna priedes as estimated by expert visual investigation. Ellipses – demarcate the trees with low-growing branches that are legibility elements. Black arrows show the mystery elements that are created by the "coulisses" formed by trees. The human symbolizes the standpoint. The white field – the perceived size of the yard as indicated by the interviewees [created by the author]

I will illustrate my findings with images. Advantages and disadvantages of every method used thus are displayed. Yet, the focus of this chapter is placed on explaining the benefits of the visual expert investigation method.

In the Figure 1 an area in the residential district *Āgenskalna priedes* is depicted. The demarcated (dark) area here is the space as estimated by the researcher using Model of Measurements of Spatial Aesthetics based on theoretical findings. It is a visual analysis method that evaluates the space as formed by the walls of the surrounding houses. The image also shows 2 mystery elements that walls create and that are visible from standpoint from which the analysis is done. This theoretical approach proposes no legibility elements in this scene. The area measures are 210×140×210×90 m, the surrounding buildings are 14 m high. The space is disliked according to the theory, hence, the dark color of the demarcated area.

The image 2 shows the same yard, yet, the demarcated area (light) is much smaller than in the Figure 1. This smaller space is the size of the yard as indicated by the inhabitants in the interviews that took place from the identical stand point as the visual analysis. The interviewees admitted, that the borders of the yard are formed by the groups of trees that are in a close proximity to the interviewee at the moment of interview; the size of this space is 70×140 m large, the heights are 17 m since the tallest trees are of this size. The prospects and refuges were not mentioned in the interviews directly. The yard is reported as tolerated, hence, the light color of the area in the Figure 2.

Figure 3 depicts the results of expert visual investigation with the focus on trees. Expert visual investigation concentrated on the following objects: there are three groups of trees in the yard, yet, the inhabitants constantly refer to the largest one as being the boarder of the yard space. This group is formed of chesnuts (*Castanea*), maples (*Acer*) and lime (*Tilia*). There are ca. 5 older, larger trees in it, they possess low growing branches. The rest of the trees are either young and thin or do not have low growing branches. This group which demarcates the space reffered to as "their yard" by some inhabitants is formed up of volumes of dense folliage and void. Such composition ensures that this group of trees is perceived as a coulise setting.

In researcher's opinion the trees with low growing branches can be interpreted as a legibility – if one climbs these trees then a better view to a space not visible from a currant viewpoint is achieved and safety is increased. Thus this group of trees alone creates 5 elements of legibility. Whereas the composition of trees in coulisse setting adds at least 2 elements of mystery as it provides prospects into the space that is anticipated, but not visible from the current stand point.

Fig. 4. Size, preference and mystery elements in a yard in Zolitūde as estimated by visual analysis. Black arrows with white outlines show mystery elements that are formed by the gaps between buildings. "L" – legibility element created by a niche in the facade. The field colored in a dark color demarcates the size of the yard, which is theoretically disliked. The human symbolizes the standpoint [created by the author]

Fig. 5. Size and preference of a yard in Zolitūde as estimated by the interviewees. The white field shows the size of the yard. The light color of this field indicates that interviewees tolerated the yard [created by the author]

Fig. 6. Legibility elements in a yard in Zolitūde as estimated by expert visual investigation. Rectangues – demarcate the missing benches that grouped together are 4 legibility elements. The human symbolizes the standpoint. The white field – the perceived size of the yard as indicated by the interviewees [created by the author]

The inhabitants who mentioned trees as a demarcation object in this rather large space adimtted liking their yard. According to theory large spaces with sufficient amount of legibility and mystery elements are tolerated. Hence, it can be estimated that also in reality enlarged amount of these elements plays a relavant role in liking of an open, undefined space that this yard belongs to also after considering the decrease of its size. It can be also expected that the mystery elements that are formed by the walls also play a role in the perception (see mystery elements in Figure 1). If they are added to the mystery and legibility elements created by trees, then there can be 4 mystery elements and 5 legibility elements counted in the scene.

Another example stems from *Zolitūde* residential area. Here the space of 110×120 m which is bordered by the buildings that are 26 m high is considered to be unliked by theoretical approach. An areal view of this yard can be seen in Figure 4. Here the theoretical size, i.e., the size of the space detected by visual analysis that is measured from wall to wall and from wall to street of this yard is demarcated. Also two elements of mystery and one element of legibility that are created by the walls and a niche accrodingly are marked. The yard that belongs to open, undefined category is considered to be theoretically disliked, hence, it has dark color in the image. 80 % of the space is covered by trees.

Figure 6 demonstrates the size of the yard, as it is perceived by the inhabitants. In this case the theoretical and the reported sizes are equal. The yard is evaluated as tolertated by inhabitants, hence, the light color of the field in the image Also in this case the inhabitants do not talk directly about prospects and refuges or lefibility and mystery elements.

Yet, after carefully analysing the utterances of inhabitats, some information on desired amount of those elements can be detected by expert visual investigation. Figure 6 demonstrates these findings. Benches play a decisive role here. An interview revealed that the yard used to be more liked. The reson for the decrease in prefference is the removal of benchhes some years ago.

Singular benches can be interpreted as a refuges since they provide some enclosure and offer some height to elevate oneselve in case of a danger. Whereas a group of benches can be interpreted as legibility: compounded in one yard they form a space of their own, especially if a circle of friends use them, forming a group. Such compound, if large enough, can provide an opportunity to see a part of space not visible from the stand point, which is used during the interview. There are 4 legibility elements formed by benches. Legibility amount is equal to the amount of compartments formed by two corssing rows of these objects. Benches can not form a prospect or mystery for that matter.

Fig. 7. Size, preference and mystery elements in a yard in Kengarags as estimated by visual analysis.
Black arrow with white outline shows the mystery element. The human symbolizes the standpoint. The dark field demarcates the size of the yard as it is detected by visual analysis. This yard it theoretically disliked [created by the author]

Fig. 8. Size and preference of a yard in Kengarags as estimated by the interviewees. The white large field shows the size of the yard as indicated by the interviewees.
The scene is liked, hence, the light color of the field. The human symbolizes the standpoint [created by the author]

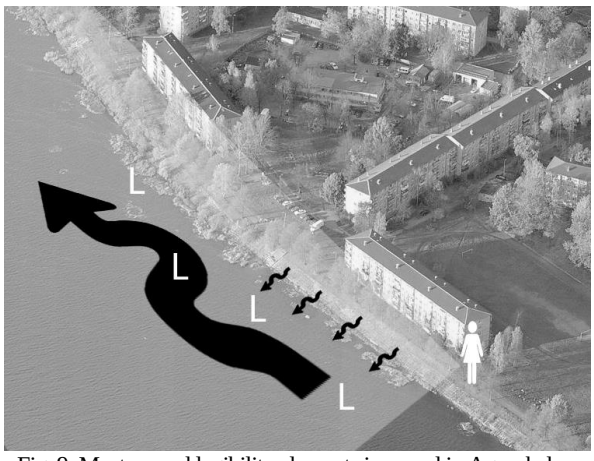

Fig. 9. Mystery and legibility elements in a yard in Agenskalna priedes as estimated by expert visual investigation.
White "L" show legibility elements formed by the river. Black arrows symbolize the mystery elements formed by the water and slope. The human symbolizes the standpoint. The white field – the perceived size of the yard as indicated by the interviewees [created by the author]

Moreover, it can be assumed that the mystery and legibility elements formed by walls (see Figure 4) can be added to the legibility elements created by benches. Thus there are five legibility elements and two mystery elements. An assumption can be done: that open, undefined space – a category that the space of this yard belongs to – improved with numerous legibility elements can become tolerated in reality.

The last example describes the perception of large water features such as river. In the figure 7 a scene in the residential area Kengarags is demonstrated. The scene is a path between the river Daugava and a residential house. It is a stretch of land that is 24 m wide and ca. 90 m long. It is bordered on one side by 14 m high buildings. In the Figure 7 this scene is depicted as it is seen from the theroretical perspective, i.e., applying the Model of Measurements of Spatial Aesthetics. Here the space is measured from wall of the house until the slope. The space is evaluated as enclosed, disliked scene with one mystery element and no legibility.

Figure 8 shows the size of the scene as it appeared in the interviews. In relationship to the evaluation by visual analysis method, the new space appears to be much larger. The interviewees talk about "the water and nature" that form the space. It extends until the opposite bank and is much longer than 90 m, it virtually extends as far as one can see, as can be detected from the interviews. Everyone loves the space, hence, the field that demarcates it in the figure 8 is of a light color. Again, also here no interviewee speaks of mystery and legibility in a direct form.

Figure 9 shows the scene as it is comprehended by the researcher. Using the expert knowledge and interpreting such an objects as the river in order to find legibility and mystery, a very different characterization of the setting in relationship to the visual analysis is appearing. The river is forming a meander, which gives the scene a very powerful element of mystery. Also, the slope leading from the path to the river is an element(s) of mystery, since descending it one acquires an overview of a setting that cannot be seen from above – from the path. The water also offers an inexhaustible amount of legibility. One can hide in the water. Besides that, if one swims couple of meters a very different scene appears as from the current stand point.

Thus the scene receives uncountable points of mystery and more than eternity points of legibility. It is highly preferred as mentioned by the inhabitants. The mystery point formed by the walls of the house (Figure 8) hypothetically adds up to the mystery level. The assumption can be done: a large open, undefined space that the scene turns out to be is "improved" with sufficient amount of mystery and legibility amounts, it can become very liked in reality.

So called expert visual investigation was used to find and analyse the information "hidden in the

interviews" on legibility and mystery elements of urban spaces. This investigation was based on inhabitant interviews *in situ*, but used expert knowledge to decipher the information of these elements. The interviews, that were discursively analyzed prior to using expert visual investigation method, provided information on size and preferability of spaces in question.

Both methods – discursive interview analysis and expert visual analysis – together provide information on three issues of interest: size, preference and mystery and legibility elements. Two data collection procedures from the same material – interviews – is proving that mixed method usage in dealing with testing theoretical questions on spatial aesthetics is recommended.

Conclusion

Spatial aesthetics is a complex issue as the theories of environmental psychology on it are. Some of the issues of interest to the researcher are evidently of such a theoretical nature that there is no lay-man that can speak of them on their own initiative.

Mixed method is a legitimate tool that enriches the research. In the case of our paper it helps to test the theory on spatial aesthetics. Yet, the downsides of such a mixed method have to be addressed in a separate paper.

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Kopsavilkums. Raksta mērķis ir aprakstīt metodi, kura, vienkopus ar jau izmantoto kvalitatīvo interviju pielietojumu, testē telpiskās estētikas teoriju. Minētā teorija balstās evolucionāras estētikas pieņēmumos. Tā postulē, ka dabā pastāv četras telpiskās kategorijas, katrai no šīm kategorijām ir atšķirīgi izmērs un proporcijas. Ainavas elementi mistika un salasāmība, esot pietiekamā daudzumā, teorētiski var uzlabot šo iecienītības līmeni.

Kā liecina literatūra, vispiemērotākais veids teorijas pārbaudīšanai ir daļēji strukturētas intervijas. Ar to palīdzību iegūtā informācija par telpas estētiku, potenciāli paplašina un dekonstruē teorētisko ietvaru, kurā aprakstītā teorija balstās. Lai to veiktu, tikai veiktas *in situ* intervijas ar triju Rīgas dzīvojamo rajonu iedzīvotājiem. Interviju mērķis bija pārbaudīt telpiskās estētikas teorijas trijos būtiskajos punktos: uztvertās telpas lielumu, telpas iecienītību, kā arī mistikas un salasāmības elementu klātbūtni telpā.

Pilotpētījums rādīja, ka intervijas sniedza pietiekami daudz informācijas pirmo divu punktu analīzei. Tomēr trešā punkta izvērtēšanai informācijas pietrūka. Lai novērstu šo nepilnību, tika izmantota papildus metode: eksperta vizuālā izpēte. Pētījumā metode tiek izmantota kā papildinājums jau iepriekš veiktajai interviju diskursa analīzei. Eksperta vizuālā analīze paredz, ka pētnieks izskata intervijās minētos telpu veidojošos objektus tādā veidā, kas sniedz norādījumus par salasāmības un mistikas elementu klātbūtni.

Raksts ierosināts izmantot t.s. jaukto metodi (*mixed method*), lai veiksmīgi izzinātu telpas estētikai veltīto teoriju atbilstību realitātei.

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Egyptian Revival in the manor parks of Latvia

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Abstract. Eclecticism (historicism) has a wide range of formal stylistic trends and variations, such as Neo-Gothic, Neo-Renaissance, Neo-Baroque and others. They were once popular and they have left many noteworthy monuments, although the trend called Egyptian style or Egyptian Revival is less known. There are very few studies on the manifestations of this style in the parks of Latvian manors, where, though not very numerous, the pyramids, obelisks and the like can be found. It should be noted that architectural and artistic objects used to be an integral part of the parks and they largely determined the emotional mood of the parks. Today, particular attention should be paid to the preservation of these elements in the cultural and historical environment.

Keywords: architectural heritage, monument protection and preservation, historical parks and gardens

The spread of *Egyptian style* in Europe and its research

A number of studies have been carried out on the spread, evolution, and monuments of the so called Egyptian style in Europe reflecting the constant interest in Egyptian architecture in the 18th and 19th centuries, with both calmer moments and flourishing periods [1]. The Egyptian pyramids and the cult of the dead drew the attention of the ancient Romans, who introduced some elements and forms in their own architecture. In the18th century the exotic and picturesque motifs and formations came into fashion, the spread of which was promoted by romanticism, started already by Rococo artists. They mainly dealt with formal aesthetic and symbolic iconographic types of problems. It was important to create the mood related to a specific place – most often a garden or a park - that could be achieved with such exotically romantic structures as Chinese pagodas, Greek temples, Gothic ruins or Egyptian pyramids and obelisks.

Pyramids played a special role in the trend of *Egyptian Revival* in the architecture of Europe from the middle of the 18th century till the early 19th century. They were mainly used for memorial sites - burials, chapels, temples. Pyramids were already found in the engravings of the artist Giovanni Battista Piranesi in 1748 [2]. They were also represented in the collections of architectural sketches of Jean François de Neufforge [3] and Johann Fischer von Erlach's first widely illustrated architectural history [4]. The form of the pyramid at that time and also later was supplemented in a variety of ways. Most often the details of classical architecture were added. It should also be noted that it was not necessary to accurately follow the proportions of the Egyptian pyramids. For example, in England a classical portico was added to the pyramid of the gate of the manor *Nostell Priory*, *West Yorkshire* (1776). It is noted as being one of the most outstanding works of this type created by architect Robert Adam [5]. A similar one is the Egyptian temple designed by architect John Soane in 1778. This architectural drawing was included in the publication *Designs in Architecture* [6], whereas all the facets of the pyramid-temple *Chapelle Sepulcrale* (1748) depicted by Nicholas Henry Jardin (*N. H. Jardin*), are adorned with porticos [7].

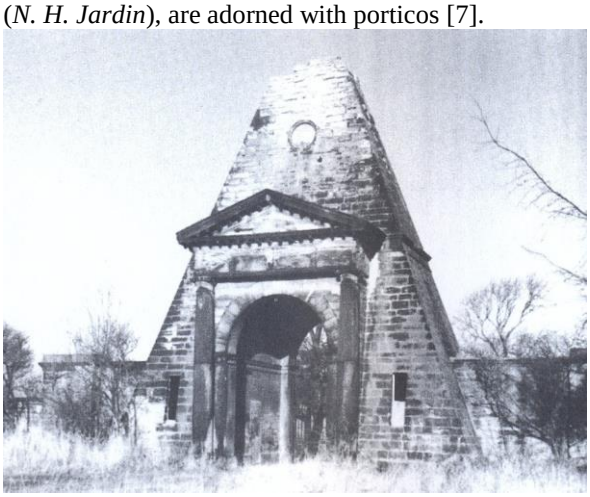

Fig. 1. Nostell Priory: Featherstone entrance, 1776
[King D. The complete works of Robert and James Adam. Oxford, 1991]

Fig. 2. Perspective of Chapelle Sepulcrale, N. H. Jardin, 1748
[Wittkower R. Essays in the History of Architecture. London, 1967]

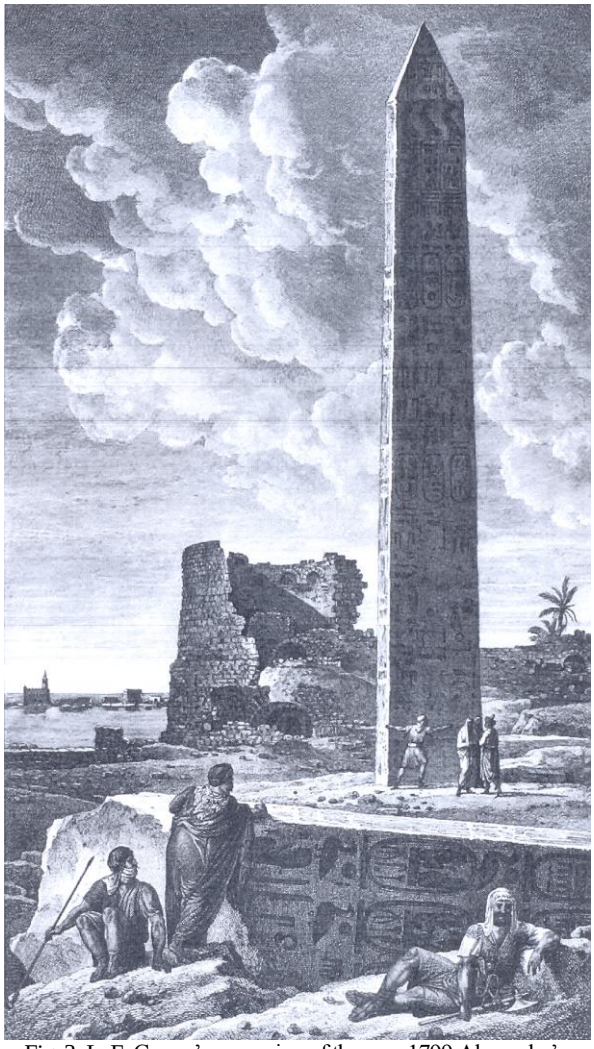

Fig. 3. L. F. Cassas's engraving of the year 1799 Alexander's tomb stone [Cleopatra's Needles and the Tower of the Romans in Alexandria (1785) by L. F. Cassas engraving
Chugg A. M The Quest for the Tomb of Alexander the Great (2nd Ed.). (s.l.): (s.n.), 2012, p. 121, Fig. 6.3.
ISBN: 9780955679063]

Fig. 4. Tombstone monument of Duchess Maria Christina in St. Augustine church in Vienna
[photo by the author, 2010]

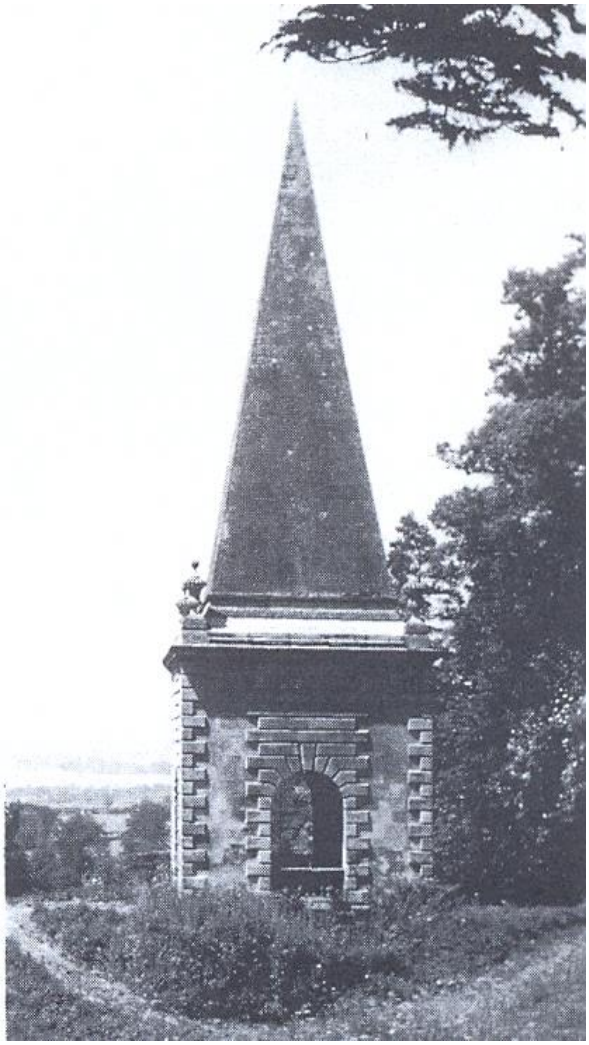

Fig. 5. The Pyramid, built by R. Tracy in memory of his father. Stanway House, Tewkesbury Abbey
[Lees – Milne J. *Some Cotswold Country Houses.* Stanbridge: Dovecote Press, 1987]

This example seems to have been particularly popular since it was often repeated later. For example, the temple designed by architect Friedrich Gilly in Berlin (around 1797), a monument dedicated to the Tartar defeat in Kazan, Russia (1823–1830, architect M. Alferov), and others. There are also other types of the use of pyramids. For example, the English architect John Carter, in the *Builders Magazine*, year 1777, recommended it for the construction of a dairy [8], but the pyramid built in Sanssouci park in Potsdam, Germany, in the 18th century served as an ice cellar. It was raised on a high socle floor, whose walls were decorated with horizontal niches which were filled with hieroglyphs. The entrance was emphasized by an ordinary portal.

Napoleon's Egyptian military campaign played a great role in the popularisation of the pyramids and Egyptian culture over the course of time. The army was followed by a whole host of monument researchers, artists and archeologists. As a result of their work, several significant publications were

printed. One of them was the 21-volume publication *Egyptian description or a collection of notes* which was created in Egypt during the expedition of the French Army [9], a copy of which is also available at the Library of the University of Latvia. The revival of the Egyptian culture was also promoted by the artists of that period, for example, painter H. Robert painted pyramids as gigantic structures and people around them in microscopic sizes. In 1799, Louis-François Cassas published the engravings of temples, gates and other buildings according to the sketches of his of previous years' travels.

Regarding the pyramids, their idea has been transformed as a result of iconographic studies and this suggests that Egyptian architectural forms have been used only symbolically to create specific historical associations. An example of this is the cenotaph proposal by Jean-Nicolas-Louis Durand (1805), where the interior of the pyramid is covered with a dome [10], so an opposite construction is used for the outside image. In other cases, the change in the structure of the pyramid has also created a new type of its use, namely, the pyramid being raised above the cubic dimension at the level of the second floor. For example, the aforementioned ice cellar in Sanssouci Park and the pyramid in *Stanway House, Tewkesbury Abbey* in England built by Robert Tracy in honour of his father John Tracy, (1750). Here, the pyramid is raised above a cubic structure, in the center of which there is an opening, corners are decorated with stone slabs, but the foot of the pyramid - with urns. A similar example can be found in a drawing of *Chatsworth Park* made by William Kent in the same country, though in front of the entrance there is a four-column portico and the garden building is named *Eclectic Roman ruins* [11].

The pyramid is not solely used as a park structure. Its image as a burial place could also be found in a church, as it can be seen in St Augustine's church in Vienna (14th and 18th centuries). It was dedicated to the archduchess Maria Christina who was buried there. The author of the monument was the sculptor Antonio Canova and it was created in the period from 1798 to 1805. In the upper part a medallion with the profile of archduchess is depicted. The pyramid here is shown as the symbol of eternity – a group of people is imminently moving through its gate.

According to G. R. Carrot, there are three phases in the development of the *Egyptian Revival*, in Britain, Germany, and elsewhere in Europe: Rococo (pictorial), Classically Romantic and Archeological (according to the publications of Napoleonic historians).

Egyptian style in the parks of Latvia's manors

In the the second half of the 18th century, the creation of landscape parks began in the manors of Latvia. As it was in Western Europe, the parks' architecture – artificial castle ruins, hermits' and meditation houses, monuments like urns and obelisks – was an integral part of them. Chinese pavilions and grottos are also a part of the style of landscape parks of those days. At the beginning of the 19th century, the sentimental small architectural forms which were so popular in the parks as, for example, false tombstones and artificial castle ruins had disappeared. They were replaced by antique forms indicating the increasing influence of Classicism. The pavilions, temples and chapels started to decorate the parks. Regarding the chapels, pyramids should be mentioned as a unique phenomenon of which, the two most famous ones are found in Dunalka (*Dubenalken*) Manor (early 19th century) and Ropaži (Rodenpois) Manor (late 18th century).

Fig. 6. The chapel in Dunalka Manor, the 1980s
[State Inspection for Heritage Protection of Latvia]

The chapel of von Fircks, the owner of the Dunalka manor, had a real pyramidal shape (slightly split at the top) with a monumental portal and a triangular pediment in front of it. There were niches on both sides of the entrance, where quite big urns were placed. Above the door was an inscription-tribute in Latin, but the center of the pediment was decorated with the coat of arms of von Fircks family enclosed in a spiral acanthus. Above the inscription there was a semicircular window with muntins finely separating panes of glass, and on both sides there were rectangular niches in which a face of an angel was depicted enclosed in a wreath and sun beams. The portal was made in the style of Classicism, but the interior of the chapel was quite romantic. Like it was in the previously mentioned J. N. L. Durand's project in 1805, the pyramid was transformed into a cylindrical space, in whose thick stone walls in three rows fourteen radial niches were formed in each row for placing coffins.

Imants Lancmanis *characterised the impression of the interior in the following way: the spatial conception is eerie and fascinating, since the viewer standing in the middle of the chapel is as if fired upon by the radiation of the numerous niches waiting for their dues. The idea of the dark niches were supposed*

Fig. 7. Ropaži chapel [photo by the author, 2017]

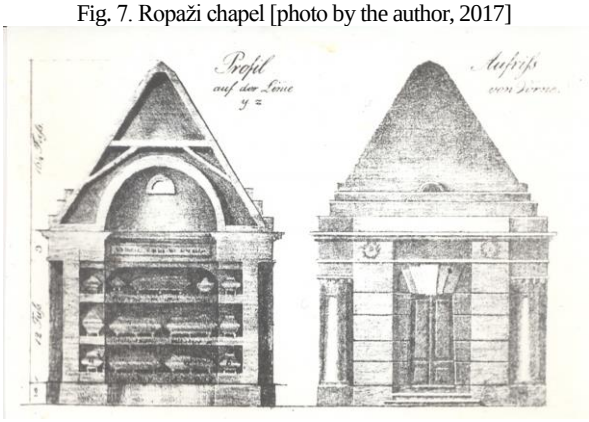

Fig. 8. An example of a chapel
[Rosenplänter J. H. Űber Kirchhofe und Beerdigung der Todten, nebst einem Anhange, den Pernauschen Kirchhof betreffend. Pernau: Gotthardt Marquardt, 1823]

to make even a heavier impression on the family members – it was a reminder of the end of life not only for the living but also for those generations to be born, that they will inevitably return to this lifetime home [12]. Today the pyramid of Dunalka looks like a heap of miserable ruins. If compared to the chapels found in foreign countries, the closest ones to Dunalka's chapel are those designed by R.Adam and J. Soane as well as Lindenau's family chapel in Machern's manor park near Leipzig (1792, arch. E. V. Glasewald), however the aforementioned project of the architect J. N. L. Durand possibly served as an example for the design of the interior space.

The second type of pyramid – von Wolff's family chapel in Ropaži was lifted above a cube type structure made of red bricks. In its centre there was a door. The façade was decorated with a bas-relief and coats-of-arms, the fragments of which could be still found scattered around the structure. Ropaži chapel-pyramid was one of the oldest in Latvia's manor houses. It was built shortly before 1784 by the amateur artist W.D. von Budberg's sketch [13]. In 1791, this structure was featured by J. C. Brotze [14]. The old building has changed little from its original shape and can still be seen today.

Such type of a pyramid was also built in Dobele cemetery (in the early 19th century) [15]. The outer sides of its cube shaped dimension were covered with tiles and the base of the pointed pyramid was moved aside from the cornice. The mausoleum of J. W. Moller's family in the courtyard of St. Trinity Church in Jelgava (18th century) also had a pyramidal stone roof. However, it had a flat top spire and its shape was gently sloping, making vague associations with the Egyptian culture [16].

A pyramid was also once erected in the landscape park of Varakļāni manor, described by the creator of the park himself – the famous Polish nature scientist and man of letters Count Michael de Borch in his book [17]. He invites the readers to have a stroll in the park with a young man born in the palace, mentioning among many different park structures that under the pyramid painted with hieroglyphs, there was some underground space in the niches of which the urns with ashes of several count's friends were placed [18].

Not far from Lieģi manor was a chapel which may also be regarded as one of the so called Ropaži type. Above the square type building was a pyramid that served as the roof for the building. A wide opening with a segmental cover served as an entrance. On both sides of the opening, coats-of-arms were immured in the wall with inscriptions of the people who were buried there.

It is interesting to observe that the Egyptian architecture has even encouraged the publication of sample books in the Baltics, where among other examples, pyramidal buildings are shown. Such is the publication of the priest from Pärnu Johann Heinrich Rosenplänter born in Valmiera [19]. In one of the drawings he depicted a building in the style of Classicism with a pyramid instead of a roof. The interior, as viewed in the section, is covered by a vault. The shape of the doorway opening is also unusual – it is wider at the bottom. The origin of this specific feature is also connected with the Egyptian architecture. It is believed that the author had compiled the data on the existing structures, and the idea of the pyramid as a symbol of eternity, seemed to be topical for him, since his book was written in 1823.

The manifestations of *Egyptian Revival* in Latvia are also evidenced by the obelisks that decorated the parks of many large manor as well as smaller manors of suburban Riga. The obelisk culture in Egypt dates back to the Second Dynasty (2890s, 2670s BC). They symbolized the connection between gods and people. The research of obelisks as part of the ancient Egyptian culture was born in the second part of the 19th century, when a special branch of science originated – Egyptology. One of the most interesting obelisks in the manor parks of Latvia is seen in the

Fig. 9. The obelisk in the park of Alūksne Manor
[photo by the author, 2016]

Fig. 10. The obelisk in the park of Mālpils Manor
[photo by the author, 2016]

park of Napkull half-manor. It is believed to have originated in the early 19th century. The Egyptian hieroglyphs are carved on the sandstone facets of the obelisk, which bear the name of King Ptolemy. Also these types of monuments may have analogies in Western Europe. For example, the monument project *Place des Victoires* in Paris (1795, architect *J. N. Sobre*) [20]. This obelisk was intended to be decorated with Egyptian characters. The Napkull half-manor obelisk, hidden in overgrown bushes is living its last days.

No less interesting was the National Advisor Herman Dahl's monument, which in 1793 was located in Möllershof's small manor in Pārdaugava. The pyramid, which looked almost like an obelisk, as described by J. C. Brotze, was made of wood, but it was treated so that it would look like marble. All the facets of the obelisk were decorated with the silhouette portrait of Dahle himself [21]. The monument was raised on the base, the corners of which were accentuated by urns – very popular elements during the period of Classicism, decorating almost everything – from buildings and furniture to the concepts and ideas expressed in memorial albums. The branches of ivy made of tin girdled the pyramid.

In another drawing of J. C. Brotze – *A part of Limbazi cemetry in 1795* one can see *a small pyramid of a stone with a white board without an inscription*, writes the author of the drawing himself [22]. Also, this pyramid looks almost like an obelisk. It was raised on a low base and its tip was flat topped. Limbaži old cemetery was demolished in the 1960s by creating a park in its place.

An impressive landscape park rich in small architectural forms is located in Alūksne Manor. It reflects the trends of the park art of the second half of the 18th century as well as the innovations of the second half of the 19th century. From the oldest park structures at the end of the 18th century one should mention the granite obelisk built in 1799 to commemorate Otto Hermann von Vietinghoff. The spire of the obelisk was once decorated with a sphere, and the facets – with the bas-relief of the above-mentioned person's profile and inscriptions. One of them read that the monument dedicated to the father was built by his grateful son Christoph Burhard von Vietinghoff.

Also in Mālpils *(Lemburg)* manor an obelisk made of fine-grain sandstone (fourth quarter of the 18th century) has been preserved. It was dedicated to the manor's owner Gustav Wilhelm von Taube [22]. The sandstone from which the monument was made is very rare in Latvia, therefore, it is believed to be imported. The main facet of the oval base of the obelisk was decorated with a serpent eating its tail - the symbol of infinity. Its enclosed circle contains the inscription: *Dem Herrn Gustav Wilchelm Taube, von der Issen 1715. 23. X – 1775. 23. X*. The image of the

serpent has not survived to this day, but it is still visible in the photographs from the 1920s. In the side facet of the base – in a rectangular frame whose corners are folded and contain rosettes, there is an inscription in German that reads: *Denkmal, Kindlicher Dankbarkeit Dem Grunder und Erbauer dieser Wohnungen* (The monument dedicated to the founder and builder of these houses, built in gratitude by his children). On the other side facet of the base there is another inscription: *In allen Geschaeften gleich Thaetig befoelderte Er Das Wohl seiner Mitbrűder und Grűndete das Glück seiner Kinder* (In all his activities he promoted the benefit of his co-brothers and provided happiness for his children). On the very facet of the obelisk in low bas-relief there is a silhouette portrait of von Taube in an oval frame.

In the recreational forest of Bīriņi Manor a monument to Ann Helen von Vietinghoff was located. It was depicted by J. V. Krauze in the drawing which was included in the collection of J. C. Brotze [24]. The obelisk was raised on a high base, whose cornice and socle were enriched by profiling. This review of obelisks in the parks of Latvian manors could be continued, thus showing their popularity. Over time obelisks became the monuments for glorification of military fame.

Conclusions

The Egyptian style in Latvian architecture at the end of the 18th century and early 19th century was an episodic phenomenon reflecting the wishes and whims of individual aristocrats. However, in other countries, the Egyptian style cannot be quantitatively compared to Neo-Gothic, Neo-Renaissance or Neo-Baroque. It gained greater popularity only in France and in England. *The Egyptian Revival* movement was iconographic; it did not have (and it could not have had) a local origin and traditions. The monuments and the projects presenting it followed the conceptual lines of romanticism, they were symbolic in nature. It also pertains to the Latvian pyramids, which are vivid examples of the building art of those days. An urgent task would be to preserve the monuments of Dunalka and Ropaži, otherwise only documentary evidence will remain to be placed next to the authentic examples found in other countries. The 18th century pyramids in Europe's parks can be relatively divided into two previously described types. We can be proud that both of them are represented in the architecture of Latvia. They are the chapels in Dunalka and Ropaži. Also the obelisks, which were not a rare phenomenon in our manor parks, played a certain role in promoting the revival of the echo of Egyptian culture. They were most often dedicated to someone's memory.

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In 1979 **Jānis Zilgalvis** graduated from the Faculty of Architecture of the Riga Technical University. In 1990, he defended his doctoral thesis on the subject of the manor architecture of the second half of the 19th century and the early 20th century. Since then, he is the Head of the Architecture Department of the State Inspection for Cultural Heritage. Since 2012 – a full member of the Latvian Academy of Sciences. Over 180 scientific and popular scientific publications and 18 books (some co-authored). The main lines of the research – the manor architecture and cultural history, sacral architecture, protection of cultural heritage.

Kopsavilkums. Par t. s. ēģiptiešu stila izplatību, evolūciju un pieminekļiem Eiropā veikti vairāki pētījumi, kuros atspoguļota 18. un 19. gadsimtā neatslābstošā interese par Ēģiptes arhitektūru. 18. gs. modē nāca eksotiski un glezniecisku motīvi un veidojumi, kuru izplatību veicināja romantisms, bet uzsāka jau rokoko laika mākslinieki. Tajos galvenokārt skartas formāli estētiska un simboliski ikonogrāfiska rakstura problēmas. Svarīgi bija radīt noteiktu, konkrētai vietai - visbiežāk dārzam vai parkam, vēlamu noskaņu, ko lieliski varēja panākt ar šāda veida eksotiski romantiskām būvēm, kādas bija ķīniešu pagodas, grieķu tempļi, gotiskas drupas vai ēģiptiešu piramīdas un obeliski.

Īpaša loma *Egyptian Revival* strāvojumā Eiropas arhitektūrā no 18. gs. vidus līdz 19. gs. sākumam bija piramīdām. Tās galvenokārt lietotas piemiņas vietām – apbedījumiem, kapličām, tempļiem. Piramīdas sastopamas jau mākslinieka Dž. B. Piranezi 1748. gada gravīrās, Ž. F. de Neiforža arhitektūras metu krājumos un J. F. fon Erlaha ilustrētajā arhitektūras vēsturē. Piramīdas forma šajā laikā un arī vēlāk papildināta visdažādākos veidos. Visbiežāk ar klasiskās arhitektūras detaļām. 18. gs. otrajā pusē arī Latvijas muižās sākās ainavu parku veidošana. Tāpat kā Rietumeiropā to neatņemama sastāvdaļa bija parku arhitektūra – mākslīgās pilsdrupas, vientuļnieku un pārdomu namiņi, pieminekļi – urnas, obeliski. 19. gs. sākumā parkos tik iemīļotie sentimentālie mazo arhitektūras formu darinājumi, kā, piemēram, viltus kapakmeņi un mākslīgās pilsdrupas bija izzuduši. To vietā nāca antīkās formas, kas liecināja par klasicisma pieaugošo ietekmi. Parkus sāka rotāt paviljoni, tempļi un kapličas. Pēdējo vidū kā unikāla parādība jāmin piramīdas, no kurām pagaidām pazīstamākās ir divas – Dunalkas (19. gs. sākums) un Ropažu muižās (18. gs. beigas). Dunalkas muižas īpašnieku fon Firksu (*von Firks*) kapličai bija īstas piramīdas forma, kuras priekšā pievienots monumentāls portāls ar trīsstūrveida frontonu. Piramīda šodien saglabājusies nožēlojamu drupu izskatā. No minētajiem ārvalstu piemēriem Dunalkas kapličai tuvākie ir R. Adama un Dž. Souna darbi, kā arī Lindenau ģimenes kapliča Mahernas muižas parkā pie Leipcigas.

Otra veida piramīda - fon Volfu (*von Wolff*) dzimtas kapliča Ropažos bija pacelta virs kubveida apjoma. Fasādi rotāja plastiski dekora elementi. Šī piramīda bija viena no vissenākajām Latvijas muižās. Tā celta īsi pirms 1784. gada pēc mākslinieka amatiera V. D. fon Budberga meta. Senā būve no šī laika savā apjomā maz mainījusies un aplūkojama vēl šodien. Šāda tipa piramīda atradās arī Dobeles kapsētā (19. gs. s.). Piramidālas formas akmens jumts bija arī J. V. Mollera dzimtas mauzolejam Jelgavas Trīsvienības baznīcas pagalmā (18. gs.). Piramīda atradusies arī Varakļānu muižas ainavu parkā. Interesanti, ka Ēģiptes arhitektūra rosinājusi Baltijā izdot pat paraugu grāmatas, kur cita vidū redzamas piramīdveida būves. Tāds ir mācītāja J. H. Rozenplentera izdevums.

Ēģiptiešu stils Latvijas 18. gs. beigu un 19. gs. sākuma arhitektūrā bija epizodiska parādība, kas vairāk atspoguļoja atsevišķu aristokrātu vēlmes un kaprīzes. Taču arī citās valstīs ēģiptiešu stilu kvantitatīvi nevar salīdzināt ar neogotiku, neorenesansi vai neobaroku. Tas lielāku popularitāti guva tikai Francijā un, Anglijā. *Egyptian Revival* kustība bija ikonogrāfiska, tai nebija (un nevarēja būt) lokālas izcelsmes un tradīcijas. To prezentējošie pieminekļi un projekti sekoja romantisma konceptuālajām nostādnēm, tiem bija simbolisks raksturs. Tas attiecas arī uz Latvijas piramīdām, kuras ir spilgti sava laika būvmākslas paraugi. Aktuāls uzdevums būtu Dunalkas un Ropažu pieminekļu saglābšana, citādi tikai dokumentālas liecības varēsim ierindot blakus citzemju piemēriem. 18. gs. piramīdas Eiropas parkos var nosacīti iedalīt divos jau aprakstītajos tipos. Varam būt lepni, ka abi no tiem ir pārstāvēti arī Latvijas arhitektūrā. Tās ir kapličas Dunalkā un Ropažos. Noteikta loma ēģiptiešu kultūras atskaņu atdzimšanas veicināšanā bija arī obeliskiem, kas mūsu muižu parkos nebija reta parādība. Tie visbiežāk veltīti kādas personas piemiņai.

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Impact of Catholic Monastery Church Building on Cistercian Monastery Formation in Livonia and the State of the Teutonic Order during 13th and 14th Century

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Abstract. Convinced Christians, in order to sacrifice themselves to God, became monks. In Italy and other remote places or at important traffic roads, building of monasteries for religious, educating and social needs was started, services and schools were organized, accommodation for travellers provided. Without applying concrete, a homogeneous planning monumental monastery churches with massive walls, restrained décor, wooden ceilings, semi cylindrical ridge or altarpiece (Latin: *presbyterium*) at the building eastern end were built. In churches, rooms with small windows were dark and enigmatic. Due to the impact of relics, the dead and martyrs' commemoration cult and ideology, basilicas had more extended planning: at the nave's eastern end a podium for the altar was made. In walls a semicircle planning chancel's niche or apse and windows were built. In order to organize ritual processions, chapels for extra altars arranged in the cross-nave or transept. The entrance into the apse joined both side-naves and surrounded by the chancel. The building's plan obtained a shape of a Latin cross. Symbolism was not the determinant factor, but rather the functionality of room. The transept, which earlier had been considered as underlying, became more important than the nave, which since the 5th century searches for fireproof cover formation and new planning and vault solutions were necessary.

In the early 9th century economic boom promoted foundation of markets and commodity exchange, building of roads, pilgrims' movement, rebirth of cities and culture. Local masters built churches and monasteries, creating compositions of manifold construction forms. Bishops' cathedrals had a small chancel, but in abbey churches, extending aisles, the chancel obtained unusual sizes. In large abbeys even two aisles, separated with the central arcade, and side apses were made. In the 10th century, in basilicas with the planning similar to the Latin cross buildings with three apse eastern-end for services place were carefully made. In the western façade, on each side of the entrance a tower was built. In Western Europe big, rich abbeys became important in economics, religion and secular politics. Applying their authority and impact on society, during the course of a very complex evolution, they created a new abbey church type.

Monasteries were subordinated to the bishop, but not so often to the Roman Pope. Abbeys not subordinated to the bishop created their separate (Latin: *abbas nullius*) or territorial abbeys (Latin: *abbas territorialis*). The first (800–814) Emperor (Latin: *Imperatores Romani Sacri*, German: *Römisch-deutscher Kaiser*) of the Holy Rome Charles the Great (French: *Charlemagne*, German: *Karl der Große*) with the help of monks' community lifestyle regulations *Regula Benedicti* (around 540), formulated by St. Benedict of Nursia, created abbeys for the Holy Roman Empire's administrative system. In the lands of the Balts, for the implementation of the cross-war policy and for deployment of military units, monks-knights built fortress-like financially and economically independent Cistercian monasteries where chapels were installed. The Cistercian sacral buildings were modest.

Keywords: Benedictines, Cistercians, Livonia, monastery church, State of the Teutonic Order

Introduction

In Italian north-west region Lombardy, Irish monks built a church on ruins of an ancient temple and founded the important Farfa Abbey (Italian: *Abbazia di Santa Maria di Farfa*, Latin: *Abbatia Farfensis*; round 681). In Italy, Benedictine traditions revived. In summer 742, in German lands Saint Boniface (Latin: *Bonifatius*; around 675?–754) encouraged Saint Sturm (around 705–779) to found a great monastery and church. In January 744, Saint Sturm chose a plot of land for the monastery in an uninhabited place by the River Fulda and after receiving the permit for building he went to the famous St. Benedict's monastery in Monte Cassino (Italian: *Abaazia Montecassino*; 529) to obtain an inspiration for creation of magnificent abbey. On March 12, 744 Saint Sturm and Saint Boniface founded the monastery of Fulda (Latin: *Abbatia Fuldensis*, *Dioecesis Fuldensis*, German: *Fürstabtei Fulda*, *Hochstift Fulda*, *Kloster Fulda*) (Fig. 1.), which adopted the *Regula Benedicti*. The first abbot (744–779) Saint Sturm, who since November 4, 751 was under the Roman Pope's direct subjugation, took care of monastery's development and created an autonomous spiritual territory of the Princely Abbey of Fulda (German: *Reichsabtei Fulda*). During the 8th–9th century, the Princely Abbey of Fulda became a prominent Christians' education and culture centre. The third abbot of Fulda

Fig. 1. The map of the Holy Rome Empire during the Ottonian dinasty regin from 911 to 1024 [8, *93*]

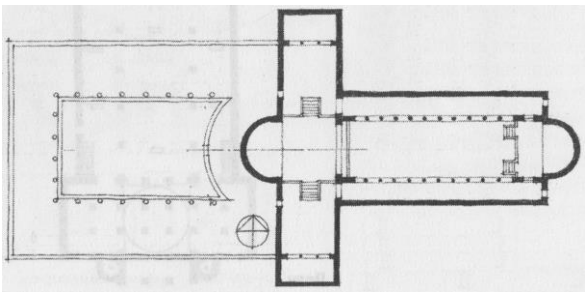
Fig. 2. The plan of the basilica of Fulda monastery [19, *311*]

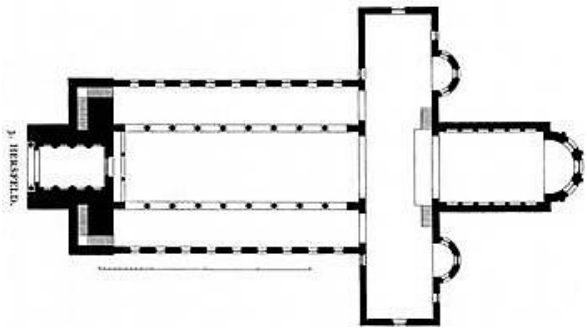
Fig. 3. Georg Dehio, Gustav von Bezold. The Bad Hersfeld Abbey Basilica plan. 1887–1901 [4]

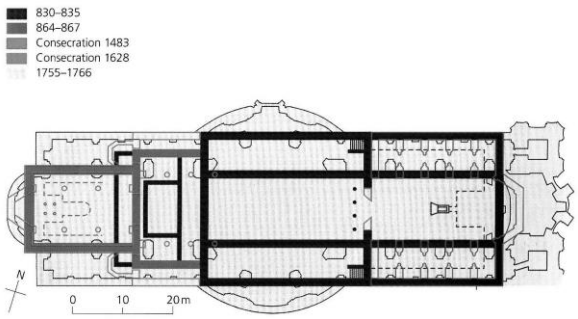

Fig. 4. Small St. Gallus and St. Otmar churches in the plan of St. Gall Benedictine monastery church of St. Gallus and St. Otmar [5, *9*]

(802–817) Ratgar (Latin: *Ratgarius*; ?–835), applying the sample of St. Peter's Basilica in Rome (Latin: *Basilica Vaticana*, *Basilica Sancti Petri*; 324/326–349), built Ratgar Basilica (791–819), instead St. Strum Church. In the west-end of the church a transept (Latin: *transeptum*) was made [19, *311*]. A courtyard, surrounded by covered galleries for walk or cloisters (Latin: *claustrum*, French: *cloître*, German: *Kreuzgang*), was added (Fig. 2).

At Saint-Riquier (originally Latin: *Centula* or *Centulum*) Benedictine abbey (around 625, destroyed in 881), founded by Richarius (around 560–645), monastic school, library and workshop for ancient record rewriting (Latin: *scriptorium*) were opened. A noble Frankish poet, who served Charles the Great as a secretary, diplomat, elected abbot in 794 Saint Angilbert (sometimes known as Angilberk or Engelbert; 760–814) rebuilt Saint-Riquier Basilica (799): in the western façade the westwork (German: *Westwerk*) for the monumental entrance was made, but the altar was placed deep in the apse. Abbey church Saint-Riquier Basilica together with Notre-Dame Chapel and San Benedetto Basilica formed the monastery's complex around the courtyard (Fig. 3).

In Saint Peter and Saint Paul Benedictine Monastery (Latin: *Laureshamense Monasterium*; 764) of Lorsch Princely Abbey (German: *Reichsabtei Lorsch*, now in Austria) (Fig. 1) there was a library with ancient authors' writings and a workshop for it rewriting. In 774, Saint Nazarius Curch (German: *Katholischen Pfarrei St. Nazarius Lorsch*) was consecrated. King of the Franks from 768, King of the Lombards from 774 Charles the Great took part in this event. After becoming the first Emperor of the Holy Rome, he paid a special attention to the abbey church reconstruction. In 775, he also awarded the status of Imperial Abbey to the Princely Abbey of Hersfeld (German: *Reichsabtei Hersfeld*; now *Hesse-Nassau*), founded by Saint Sturm and Saint Boniface. In 780, pilgrims started to visit Hersfeld Abbey. A new basilica was built to extend the abbey's building, but in 1038, a fire destroyed this basilica. Bad Hersfeld Abbey Church reconstruction was started immediately, and in 1144 triple-nave basilica with a deep apse and extra altars in the cross-part (Fig. 4) were consecrated.

In the Benedictine monastery of Saint Gall (German: *Fürstabtei St. Gallen*; 719) (Fig. 1), where monks were engaged into science, crafts and farming, the first abbot of the Abbey of Saint Gall Otmar founded a school, made a library and built a stone church (719). In 819, Charles the Great's advisor Abbot Heito (also Haito; 762–835/836) from Reichenau Abbey (German: *Kloster Reichenau*, Latin: *Monasterium Augiensis*) (Fig. 1) under Abbot (816–837) Gozbert's guidance drew the idealplan of Saint Gall Abbey (German: *St. Galler Klosterplan*).

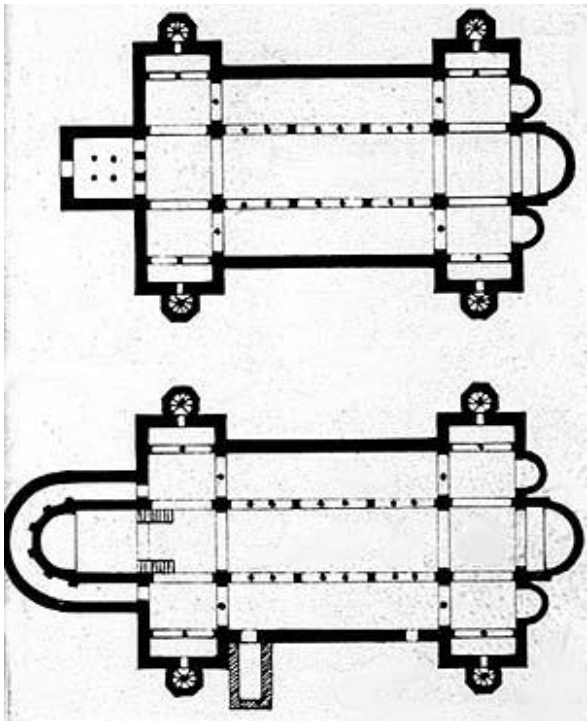

Fig. 5. The evolution of Hildesheim St. Michael's Church plan [online 19.06.2017, source: http://www.pitt.edu/~tokerism/0040/images4/ar.96.04052.jpg]

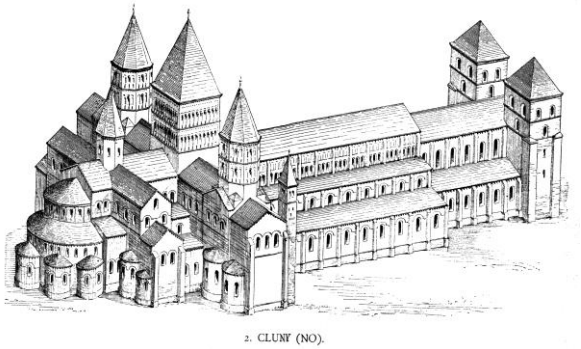

Fig. 6. Georg Dehio, Gustav von Bezold. The drawing of Basilica Cluny III reconstruction. 1887–1901 [4]

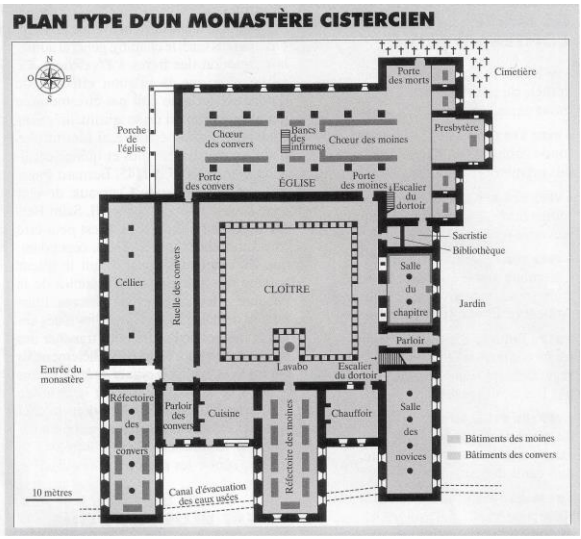

Fig. 7. The functional scheme of Cistercian monastery complex [online 19.06.2017, source: http://www.lille.iufm.fr/passages/article.php3?id_article=25]

In a fortified rectangular territory craftsmen's workshops, travellers' accommodation, monastic school [12, *24*], hospital, library, gardens, stables were placed. Blocks of two, four or more buildings became a unit of regular planning residential structure. In the southern side of the courtyard with a fountain or cross and the cloister garden (German: *Kreuzganggarten*) was surrounded by dormitory, refectory (Latin: *Refectorium*) or canteen, kitchen, but southwards administration buildings, homes and household buildings were grouped. One part of the abbey territory was not built up in order to preserve the link with nature. In the eastern-corner, a garden for herbs was envisaged (German: *Kräutergarten*). In the south-east part, where monks' cemetery (German: *Obstgarten auf dem Friedhof der Mönche*) was situated, a vegetable garden (German: *Gemüsegarten*) and apple orchard was made [11, *13*, *16*, *17*, *19*] (Fig. 5). Gorbert started wide changes: eastwards from the church he created an infirmary (Latin: *infirmarium*) and garden for sick monks, northwards – abbot's block, school and guesthouses, but a little further – stables and servants' homes. However, the ideal-plan was not implemented. St. Otmar Church was rebuilt (830–835) into a triple-nave building, which joined together (864–867) with St. Gall Church, created a long two-division basilica with a wide nave and big apse for the chancel, where the altar for St. Peter and St. Paul was placed. However, the building did not have the transept. On the western façade of Benedictine monastery church of St. Gallus and St. Otmar (German: *Stiftskirche St. Gallus und Otmar*) (Fig. 6) [5, *10*] a pair of towers was made – on the top part of one of the towers there was the altar of St. Michael the Archangel, but on the other – the altar of St. Gavril the Archangel. The abbey was included in the common defence system with the town and it affected the fortified territory planning.

In the East, the lands were conquered, and in Northern Italy the Romanesque construction forms, whose prototypes could be found in Asia Minor and Syria, emerged. In German lands, innovations were introduced through Lombardy and Ravenna, but later also through Italy, France and Spain. In 950, in Gernrode (German: *Gernrode*) Virgin Mary and Apostle Peter's Collegiate Church (German: *Kollegiatstift, Chorherrenstift*) obtained Saint Cyriakus' relics (*Cyriak;* about 303). In 965, relics were buried in the central part of triple-nave building, and in aisles of Saint Cyriakus Church (German: *Stiftskirche St. Cyriakus*; 959–965) matronaea (German: Empore, Latin: *matroneum*, *matronaeum*) were made. In the 10th century, in the region to the north from the Alps it was a novelty. In the eastside of the basilica, where the nave was crossed the transept, two small apses were made in transept. Behind the transept under the chancel a place of grave covered

with vaults and the crypt (Latin: *crypta*) was built. A cylindrical staircase tower surrounded the westwork from each side. In the 12th century, Saint Cyriakus Church was partly rebuilt: in the western side behind the transept the chancel, apse and triple-nave crypt were placed in addition, but staircase towers raised for two floors. Matronaeas were replaced in the aisle. An open transept directed towards the middle cross.

In Lower Saxony Bishop of Hildesheim (852–874) Altfrid built the Dome (German: *Mariendom*; 872), which was a triple-nave basilica with a westwork. On a hill, Bishop of Hildesheim (993–1022) Bernward built a small Saint Cross Chapel, consecrated on September 10, 996. In 1010, in Hildesheim the new abbey church construction began. On St. Michael's Day, on September 29, 1015 the western crypt for Bernward's burial place was consecrated (Fig. 7) and the patron was stated. It is possible that Bernward not only suggested building St. Michael's Church (German: Michaeliskirche; 1010–1033), but he was also its architect, who has given an important contribution to church building formation. It is considered, that architect could also have been the first abbot of the new Benedictine monastery (1022–1030) Goderamnus. In 1033, St. Michael's Church was consecrated by Bishop of Hildesheim Gotthardus (Latin: *Godehardus Hildesheimensis*; 960–1038) [18, *53*]. Nevertheless, the building in 1034 and 1186 was destroyed by fire. The middle-nave columns were replaced, and around 1230 the triple-nave room was covered with a painted wooden ceiling. The main entrance on the side of the building from the market confirmed decrease of the westwork importance in architecture of churches. Saint Cyriakus Church and St. Michael's Church obtained a simple, thoughtful solution with monumental towers, which dominated in urban silhouette.

In the middle of the 11th century, in Western Europe basilicas stone vaults building began in order to replace the wooden ceiling of the nave [18, *46*]. Abbot (930–936) Ratfredus rebuilt Farfa Abbey, but Abbot of Farfa (1049–1089) Berard I it changed into a place for intellectual activities. In 1013, Bishop Alibrando founded the Benedictine monastery in Florence, and instead of the 3rd century building, he started to build the triple-nave San Miniato al Monte Basilica (1013–1207) without the transept, adding to it the sacristy, chapel and belfry. The crypt was covered with cross vaults [17, *30*]. A new type of sacral buildings was created.

In the 10th century the abbot of the Princely Abbey of Fulda became the Benedictines' leader in German lands on the left bank of River Rhine and in Gaul, and Benedictines arrived in Burgundy, the eastern region of France. On September 11, 910 in *Saône-et-Loire* on the base of the *Clugny* Villa Duke of Aquitaine (893-918) Guillaume le Pieux, subjugated to pope, founded Cluny (also Cluni) Abbey. There was a different organizational structure: monks lived in compliance with the *Regula Benedicti*, but between their prayers, they did some physically light work – made different objects for church, did some gardening, read books, rewrote and illustrated books. Under the first abbot of Cluny (909–926) Berno (French: *Bernon*) guidance the earliest basilica Cluny I (927) was built. It was the world's largest church until St. Peter's Basilica construction began in Rome. In 931, Pope (931–935) Ioannes XI awarded the second abbot of Cluny (927–942) Odo (French: *Odon*) the privilege to take over in his jurisdiction abbeys which were going to implement the Cluniac Reforms – envisaged to maintain discipline in abbeys, observe statutes of the Order and unity in the building planning. French bishops, who did not want to lose their impact on abbeys, put up their strong resistance. However, the reform promoted formation of a union around Cluny Abbey as a centre, which in 939 obtained independence from secular power, implemented transition a self-sufficient agricultural unit and was the leading one among the seven-abbey union (Latin: *congregatio)*. Abbeys obtained political support. In the development of abbey church type the social function became important. Under Abbot of Cluny (964–994) Maiolus (*Maieul*, *Mayeul*, *Mayeule*) and Abbot of Cluny (994–1049) Odilo guidance the church was rebuilt, and basilica Cluny II (955–981) was made. The spatial composition of volumes was subjected not so much to liturgy of the abbey and monks' seclusion, but rather to ideology and services to large-scale pilgrims' flow. The greatest part of Burgundy and French abbeys were included in the union, and the total number increased up to 65. During Abbot of Cluny (1049–1109) Hugh (French: *Hugues de Cluny*) reign Cluny Abbey obtained authority and a huge impact on society. It promoted by strictness, obedience, charity, hospitality. Cluny Abbey prospered under Roman Pope's subjugation, and the fast development of St. Peter's and St. Paul's Abbey community caused a need for large buildings. Monk Guncon, who in his dreams saw St. Peter, proposed to extend the basilica, so that it would be possible to gather a thousand monks at the same time. On September 30, 1088 construction of Abbey of Cluny III (1088–1220) for the centre of the abbey's complex was started. The planning of 187 m long five-nave Saint Michael Basilica (1088–1131) reminded of the archbishop's cross. At the end of the middle-nave behind the transept a circular passage around the ridge was made, and the ambulatory or curving aisle in the apse that passes behind the altar was surrounded with the *chevet* of five small apse-chapels – apsidioles for the altars, in 1095 were consecrated. The church had five towers – one in the centre of the middle cross, two – above the big transept, and two more – at the western

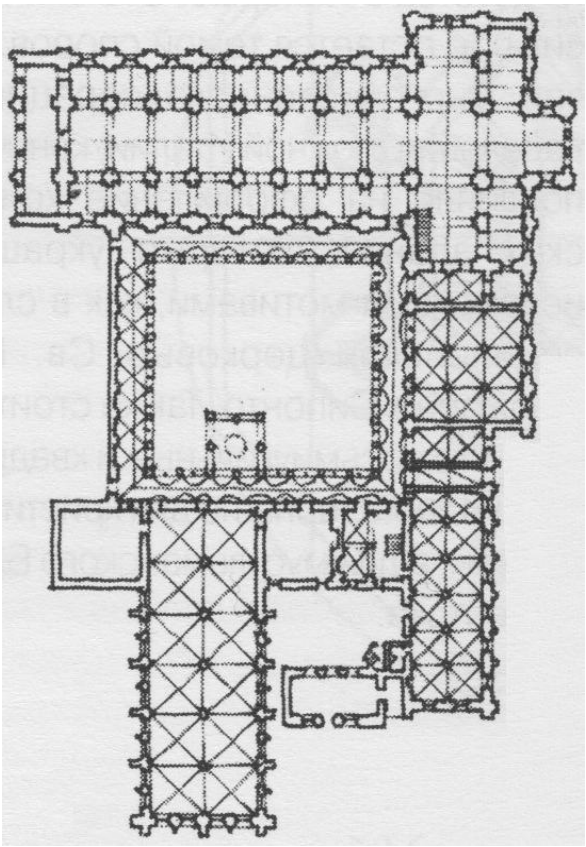

Fig. 8. The floor plan of Fontenenay Cistercian abbey complex and basilica [19, *401*]

acade (Fig. 8), where in front of the main entrance the perspective portal was built for the first time and a closed anteroom – a long triple-nave narthex (German: *Nartex*) was made. Around 1080–1090 a Benedictine monastery church type was created, and it was applied in several places in Europe. With the help of the pope, abbeys, worked in isolation, were included in the union by Clunians, in which around 1100 there were about a thousand reformed abbeys. Abbot of Cluny obtained a spiritual supreme command and around the 12th century, several thousand monks were united in a religious brotherhood. On October 22, 1131 the abbey church of Cluny, consecrated by Pope (1130–1143) Innocentius II, in terms of significance from 1122 till 1156 was the next one after the Christianity centre in Rome [18, *50*].

Previous researches on abbey churches in Western Europe: in Georg Dehio's and Gustav von Bezold's "*Kirchliche Baukunst des Abendlandes*" [4], issued in Stuttgart 1887–1901, graphical materials of cult buildings – plans, cuts, façade drawings have been collated, Josef Grünenfelder has dedicated to St. Gallus Abbey Basilica the edition "St. Gall Cathedral. The former Benedictine abbey church of St. Gallus and St. Otmar" (2009) [5]. Karl Schmuki, Ernst Tremp and Andrea Grandjean have collated the history of St. Gallus school in the book "Das Kloster St. Gallen und seine Schulen" (2009) [12], but Karl Schmuki, Ernst Tremp and Nina Otto's book "Heilkräuter und Gartenanlagen im Kloster St. Gallen" (2010) [11] is dedicated to the abbey's gardens. In Rolf Toman, Alan Bednorz and Barbara Borngässer's book "Cathedrals and Churches of Europe" (2015) [14] broad information on churches and cathedrals in Europe has been included. **Previous researches on monastery churches in Livonia:** the famous fortress researcher in the Baltics, Estonian historian of art, Professor of Tartu University Dr. phil. Armin Tuulse (1907–1977) has collated the data on monastery buildings in Estonia and Latvia in the edition "*Die Burgen in Estland und Lettland*" (1942) [16]. The outstanding Latvia historian, prof. emeritus Dr. Indriķis Šterns (1918–2005) of Muhlenberg College, US the information about monastery buildings has included in monographs "*Latvijas vēsture. 1290–1500*" /History of Latvia. 1290–1500/ and "*Latvijas vēsture. 1180–1290. Krustakari*" /History of Latvia 1180–1290. Crusades/ in the edition "*Senā Rīga*" /Ancient Riga/, issued by Latvia Institute of History. The encyclopaedia "*Latvijas 12. gadsimta beigu – 17. gadsimta vācu piļu leksikons*" /Lexicon of late 12th – 17th century German Castles in Latvia/ (2004) [3] was compiled by archaeologist prof. Dr. habil. hist. Andris Caune and Dr. Ieva Ose and has been published into series of books "*Latvijas viduslaiku pilis*" /Medieval Castles in Latvia/. The encyclopaedia "*Latvijas viduslaiku mūra baznīcas. 12. gs. beigas – 16. gs. sākums*" / Medieval stone churches in Latvia. Late 12th cent-early 16th cent. / (2010) [2] compiled by Andris Caune and Ieva Ose, includes broad information. Prof. Dr. hist. Ilgvars Misāns and asoc. prof. Andris Šnē of Latvia University History and Philosophy Faculty have prepared materials for seminars in Medieval History of Western Europe "*Klosteris, pils un pilsēta*" /Abbey, Castle and City/ (2004) [8]. **Previous researches on monastery churches in the State of the Teutonic Order:** Dr. Liliana Kranz-Domasłowska (b. 1954) has included the information on monastery churches in the research about double cities "Double cities in the Teutonic state on the example of Toruń" (2013) [7].

Research problem – the impact of medieval monastery complexes on the origins of Livonian and Prussian urban environment and building formation has been studied insufficiently. **Research novelty** – the identity of Livonian and Prussian monastery churches' architecture and impact of monastery building complexes on the urban environment formation origins in the Baltic during the 13th–14th century have been analysed in European and regional context. **The goal of the research** – analyse the peculiarities of architecture and planning of monastery churches, as well as the monastery complex influence on establishment of the Teutonic Order's fortified power centres and town planning of Livonia and Prussia during the 13th and

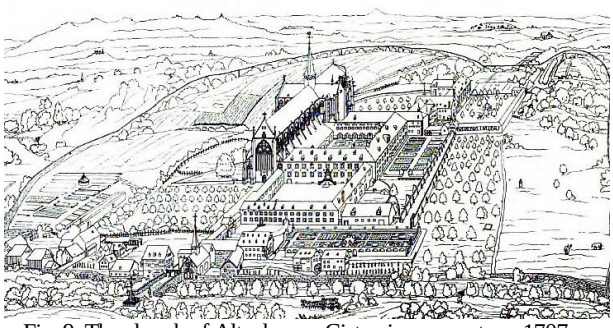

Fig. 9. The church of Altenberger Cistercian monastery. 1707 [Source: Die Kunstdenkmäler der Rheinprovinz]

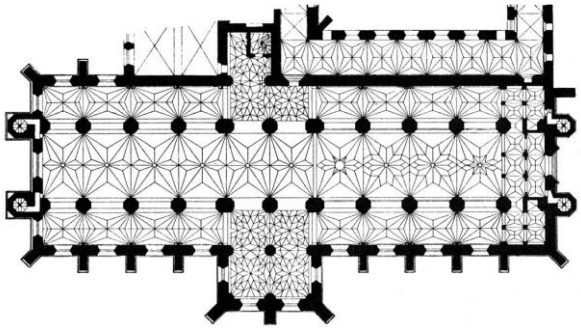

Fig. 10. Georg Dehio, Gustav von Bezold. The Cathedral Basilica of the Assumption of the Blessed Virgin Mary in Pelplin. 1887–1901 [4]

14th centuries in order to determine the common and different characteristics. **Main methods applied** – this study is based on research and analysis of archive documents, photo materials, projects and cartographic materials of urban planning, as well as inspection of buildings in nature, study of published literature. **Results** – study of architecture, layout formation and structure of Cistercian monastery churches.

The Cistercian monasteries planning and structure

Benedictine monks, who criticized crave for luxury and unwillingness to do hard work, joined in a group. In France, the Cistercian Order (Latin: *Ordo Cisterciensis*) under the subjugation of the Roman Catholic Church was established, and in it there was a distinct Cult of Mary. In 1098, in French Region *Côte d'Or* the first Cistercian monastery (French: *Abbaye Notre-Dame de Cîteaux*) was founded. It sustained with farming and a brewery and called the New Monastery (Latin: *Novum Monasterium*). The base was self-sufficiency – monks had to gain their subsistence from handwork, farming and cattle breeding. Therefore, it was necessary for monastery to have waters, forests, animals, vineyards, meadows and fields away from the secular people's places of residence. Cistercians led a modest lifestyle. They observed strict Lent, worked on the farm and built monastery buildings close by energy resources – rivers or brooks. To satisfy monks' basic needs the building in a farmstead consisted of a chapel and a wooden house with a bedroom, dining-room and kitchen, but during 1124–1193 stone buildings were erected. In remote areas, the third abbot of Cîteaux (1109–1134) Stephen Harding established building of Firmitas (1113), Pontiniacum (1114), Morimond (1115) Cistercian monasteries. On 25 June 1115, Bernardus Claraevallensis (1090–1153) founded the monastery naming it *Claire Vallée*, which evolved into Clairvaux. This monastery building was similar. In 1118, in France Bernardus founded one of the biggest Cistercian monastery – the Abbey of Fontenay. Pope (1119–1124) Calixt II confirmed the *Charta Caritatis* and set requirements for room placement and functional organization of the New Monastery. It was forbidden to establish monasteries in cities, by farms and castles, but building was allowed only within the monastery territory, in which there had to be a garden, craftsmen's workshops, a water spring, homes, a chapel, rooms for catering and guest hosting. Cistercians, applying of the Benedictine monastery basilica planning as a sample, in 1135 started to build the Basilica of Clairvaux Abbey (Latin: Clara Vallis). However, Abbot of Clairvaux (1115–1128) Bernardus criticized too long and wide house. It was not allowed to place in churches expensive paintings, stained glass windows and sculptures, which disturbed concentration during prayers, but it was allowed to place the Christ the Saviour's image and paintings only on crosses made of wood. Stone belfries were forbidden in Cistercian churches, and colourful floors were not allowed [8, *193*]. Monks of Cluny Abbey criticized introduced requirements. Bernardus, having borrowed the idea form ancient Greek homes, where rooms were placed around the peristyle (Latin: *peristylium*) or an open square yard, surrounded with the portico, developed a functional scheme (Fig. 9) for the construction of Cistercian monastery complex. In the north of the church, cloister buildings were placed: in the west – cells (Latin: *cella*), in the south – refectories, but in the east – the sacristy, library and other rooms. In 1147, Pope (1145–1153) (Fig. 10) Beatus Eugenius III consecrated the cross-type planning Fontanay Basilica with ascetic, minimally decorated triple-nave praying room with mosaic floor, covered by high vaults. The square-type choir situated lower than the nave, separated by the colonnade on aisle each side. On the basilica south side the cloister took from the courtyard to square planning Hall of Priests' Chapter, surrounded by the portico. In Lower Saxony westwards from Hannover, during economic boom in the first half of the 13th century Loccum Cistercian monastery (German: *Kloster Loccum*; 1163) wooden houses were replaced with a stone building complex, which made according to the functional scheme [6, *345*]. Cistercians gave riches and plots of land, and allowing deviations from original principles and differences between Cistercians and Benedictines decreased. After Bernardus Claraevallensis' death, construction volumes of Cistercian monastery buildings increased.

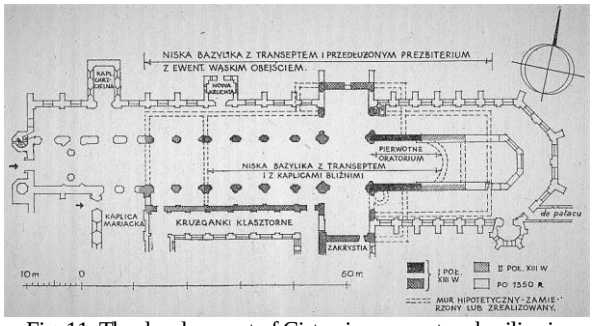

Fig. 11. The development of Cistercian monastery basilica in Oliwa. [online 19.06.2017, [http://www.dawnaoliwa.pl /bibloteczka/1956_oliwa/kosciol_a.jpg]

Fig. 12. Graphic artist Albert Wilhelm Adam Juchanowitz (1817–1863). The Holy Trinity, St. Virgin Mary and St Bernard's Church of Oliwa Cistercian monastery in 1574. Lithogrph of Friedrich Heinrich Bils (1801–1853). 1838 [*Oliwa w starych sztychach.* (1996) Gdańsk: Oficyna Czec.; http://www.dawnaoliwa.pl/wydawcy/sztychy/01d.jpg]

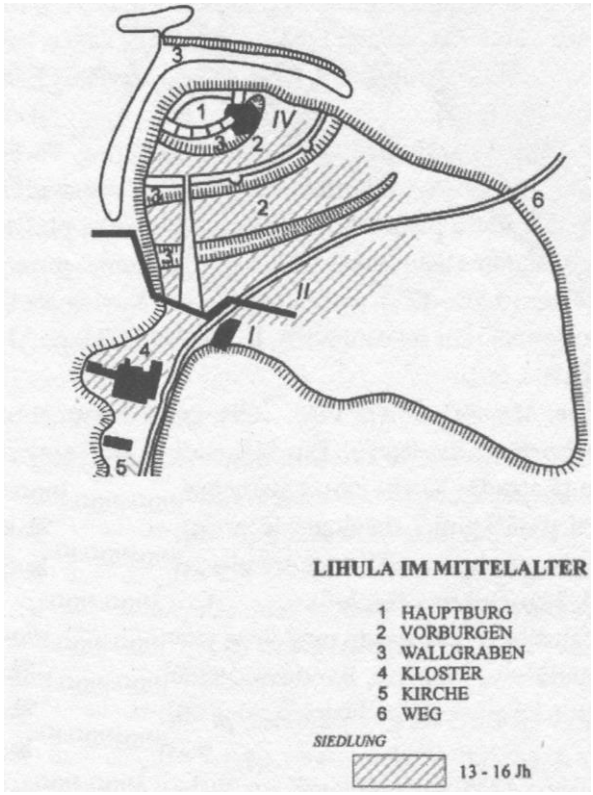

Fig. 13. The situation plan of Leale fortress and Cistercian monastery [16, *72*]

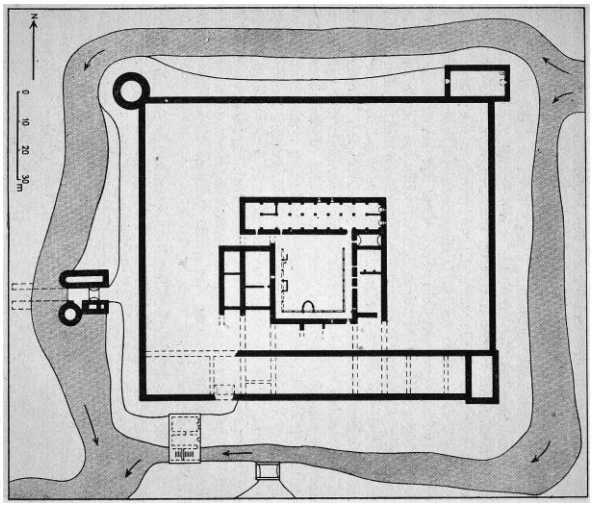

Fig. 14. The plan of Kärkna Cistercian monastery [16, *271*]

Cistercian monasteries were built in lands where there was a different economic and political situation and, due to the local construction tradition, the formal differences deepened.Windows of rooms were decorated with stained glass. Floors covered colourful tiles. External walls' vertical and horizontal partition was refined with a sophisticated décor of geometrical and plant motives. Nevertheless, despite the diversity, the building of the *Clairvaux* and *Cîteaux* Abbeys, and Altenberg Abbey (German: *Abtei Altenberg*, Latin: *Vetus Mons*; 1133) Church (1259–1276) [14, *44*] (Fig. 11), now known as the Altenberger Dom (German: *Altenberger Dom* vai *Bergischer Dom*), took into account Bernardus Claraevallensis' directions, thus buildings were similar.

During 11^{th}–12^{th} century, in Europe most of inhabitants were Christians. Around 1139, Christianity was also introduced in Pomerania (Latin: *Pomerania*, German: *Pommern*, Polish: *Pomorze*). In 1175, Kobitzow (Colbitzow till 1945, Polish: *Kołbaskowo*) monastery monks from Stettin (Latin: *Stetinum*, *Sedinum*, Polish: *Szczecin*) Region arrived in Pomerania to carry out pastoral case. In 1185, in confluence of the Rivers Motława and Leniwka not far from Danzig (Polish: *Gdańsk*) an oratory was built with the help of Duke Sobiesław I Gdański (Latin: *Sobieslaus*, 1130–1187). On July 2, 1186 Cistercian monastery *"Beatae Mariae de Oliva*" (German: *Kloster Oliva*, Polish: *Opactwo Cystersów w Oliwie*) was founded, and on March 18, 1188 Duke of Pomerania, regent of Pomerelia (1180–1207) Sambor I handed over to monks the ownership statement. A church (*kościół pw. św. Mikołaja*; 1190) was founded in honour to seafarers' patron Nikolaus von Myra. In 1215, in Danzig the centre of Cistercians monasteries was established.

In 1276, on the left bank of the Weichsel southwards from Danzig, monks of Doberan Abbey started to build a red brick complex according to the functional scheme – Pelpin (Latin: *Polplinum*)

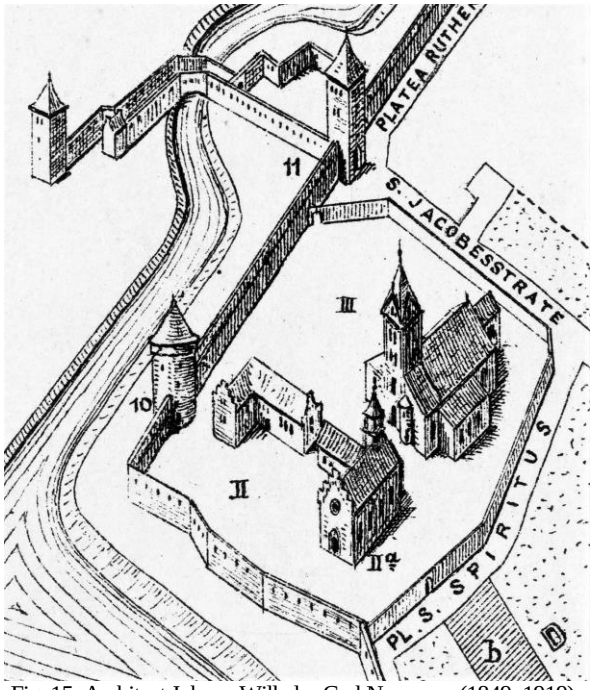

Fig. 15. Architect Johann Wilhelm Carl Neumann (1849–1919). A fragment of Riga reconstruction plan with Riga Archbishopric Centre's building around 1400: the monastery church of St. Mary Magdalene near St. Jacob's Church. 1889 [13]

Abbey (1258–1823). In 1824, a triple-nave basilica without a tower became the Cathedral Basilica of the Assumption of the Blessed Virgin Mary (Polish: *Bazylika katedralna Wniebowzięcia Najświętszej Maryi Panny w Pelplinie*) (Fig. 12), whose chancel was made in 1276–1294 [15, *245*]. In 1224 and 1234–1236 triple-nave Church of Oliwa was burnt down by Prussians, but after the third fire in 1350 the Holy Trinity, St. Virgin Mary and St Bernard Church (Polish: *kościół pw. Trójcy Świętej, NMP i św. Bernarda*) were restored as a triple-nave basilica with a cross-nave and extended chancel (Fig. 13). The main entrance in the western façade was emphasized with high twin towers (Fig. 14).

The Cistercian monastery church planning and structure in Livonia and the State of the Teutonic Order

In the middle of the 12th century, the Holy Roman Empire started to spread Christianity also in the West Slavs, Balts and Baltic Finns' lands on the south coast of the Baltic Sea. For colonization churches, abbeys and towns were set up. In Livonia, due to frequent wars Cistercian monasteries were used for defence and refuge. Alt-Dünamünde (Latvian: *Daugavgrīva*) Cistercian monastery in a strategically significant place not far from the Port of Riga became an important support site for knights arriving in Livonia and leaving it [6, *354*]. On May 26, 1305 the Teutonic Order for the river estuary's surveillance bought the monastery [9, *70*]. The building, surrounded with a ditch full of water, was converted into the commander's residence (1305–1560), where after 1329 a convent of 12 brothers-knights was established [3, *133*], preserving monastery's planning, as well as the placement of dining-rooms and the chapel in the south-east corner [6, *355*]. In the Leale Bishopric (*episcopatus Lealensis*) or Estonian Bishopric (*Episcopatus Estiensis* or *episcopatus de Hestia*; 1211–1224) centre the Bishop's residence (1220–1238) was built: a courtyard, made up by a defensive wall, customized to the relief, building up houses on the yard side. In the 13th century, in Leale (Estonian: *Lihula*) the first church was built on the main building's south wing, to which the separate courtyard was detached with the defensive wall and residential blocks. The planning of fortified courtyard obtained sequestered, functionally different zones. Near the fortress urban settlement and the Cistercian monastery (destroyed in 1570) were formed (Fig. 15). In Falkenau (*Falkenau*, *Valkena*) by the River Emajegi, Bishop of Tarbatu (1224–1248) Hermann I (German: *Hermann von Buxhövden*) founded Kärkna Cistercian monastery (*kloster Kärkna*, *Kaerkna klooster*; 1233/1234–1558). Construction volume blocks were placed around the courtyard and the rectangular planning building reminded of a fortress of the Teutonic Order [1, *18*].

In 1246, in Lübeck a monastery for Cistercian nuns was built. Pope (1254–1261) Alexander IV in his letter of August 2, 1255 mentioned a place in Riga at St. Jacob's (also St. James's) Church (German: *Jakobskirche*, Latvian: *Sv. Jēkaba baznīca*), where a Cistercian monastery has to be established for citizens' unmarried daughters and widows' care. He mentioned monastery's privileges and the *Regula Benedicti*, awarded to it. Formation of the monastery has to be related to May 1, 1257 [2, *314*]. Westwards from the St. Jacob's Church entrance St. Mary Magdalene's Church (Latvian: *Rīgas Svētās Marijas Magdalēnas Romas katoļu baznīca*) and buildings in monastery's courtyard created a partition into two functionally different zones. In 1259, Archbishop of Riga in the subsidy document confirmed the present to the monastery – the courtyard at St. Jacob's Church. The Canonical Chapter allowed Cistercian sisters to use the courtyard while St. Mary Magdalene's Church of the monastery was built. In the document of 1262 it was reported that a new wall would be built in the suburbs of Riga at the defensive wall around the monastery, but buildings at the cemetery of St. Jacob's Church would be knocked down [2, *282*]. Since 1256 the Cistercian monastery existed in Kokenhusen (Latvian: *Koknese*) urban settlement, to which on July 13, 1277 the Riga City Statutes were awarded. In Lemsal (Latvian: *Limbaži*) St. Anna's monastery for Cistercian sisters was founded before 1450 [2, *200*].

On the River Weichsel right bank, at the Old Town of Kulm (Polish: *Chełmno*) defensive wall (13th–15th cent.) northwest corner the Monastery of

the Sisters of Mercy for Cistercian nuns (German: *Frauenkloster Chełmno*, also *Kloster Kulm*, Polish: *Zespół klasztorny Sióstr Miłosierdzia w Chełmnie*; 1261, 1280–1330) and St. John the Baptist and St. John the Evangelist's Church (Polish: *kościół śś. Jana Chrzciciela i Jana Ewangelisty*; 1280–1330) were built. It is considered that the lower part of the church was completed in 1310–1320, but the upper part around 1330–1340.

Conclusions

1. In Livonia and the State of the Teutonic Order, Cistercian and Augustinian monasteries were founded. The convent building complex was developed, but the monastery church was small.

2. Kärkna Cistercian monastery, as well as Alt-Dünamünde Cistercian monastery was built for the Baltic land subjugation as the places of residence for monks-knights. In Riga Alt-Dünamünde Cistercian monastery, houses were arranged around the courtyard, but monastery buildings for Cistercian nuns at St. Jacob's Church made a fortified yard divided into two functionally different zones. St. Mary Magdalena's Church was built westwards from the entrance of St. Jacob's Church. In Kokenhusen, as well as in Lemsal buildings of St. Anna's Cistercian Monastery might have formed a fortified yard.

3. In the State of the Teutonic Order the Monastery of the Sisters of Mercy for Cistercian nuns was built in the north-west corner of the Old Town of Kulm by the defensive wall (13^{th}–15^{th} cent.), where also St. John the Baptist and St. John the Evangelist's Church was situated. Buildings of the Monastery of the Sisters of Mercy created a fortified yard.

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Kopsavilkums. Pārliecināti kristieši kļuva par mūkiem un nomaļās vietās vai pie lielceļiem sāka reliģiskām, izglītojošām un sociālām vajadzībām dibināt klosterus, kur organizēja dievkalpojumus un skolas, pārrakstīja grāmatas, nodrošināja ceļiniekiem naktsmītnes, aprūpēja atraitņus, bāreņus, dziedināja slimus ļaudis. Neizmantojot betonu, cēla vienveidīga plānojuma monumentālas klosteru baznīcas ar puscilindrisku kori jeb altārdaļu (latīņu: *presbyterium*) austrumgalā, koka griestiem, masīvām sienām, atturīgu dekoru. Baznīcu telpas ar nelieliem logiem bija tumšas un noslēpumainas. Ideoloģijas un mirušo piemiņas kulta ietekmē baziliku plānojums kļuva izstiepts: vidusjoma austrumgala noslēgumā altārtelpas pusapļa plānojuma nišā jeb apsīdā izveidoja paaugstinājumu altārim, sienās izbūvēja logus. Rituāla procesijas organizēšanai ierīkoja kapelas, papildus altārus šķērsjomā (latīņu: *transeptum*). Deambulatorijs jeb ieeja apsīdā savienoja abus sānjomus un ļāva apiet apkārt altārtelpai. Celtne ieguva latīņu krusta aprises, taču noteicošā nebija simbolika, bet gan telpas funkcionalitāte. Transepts, ko uzskatīja par pakārtotu, kļuva nozīmīgāks par vidusjomu un kopš 5. gs. bija vajadzīgs ugunsdrošu pārsegumu izveidei, jaunu plānojumu un velvju risinājumu meklējumiem. Ekonomika 9. gs. sākumā veicināja tirdzniecību, svētceļnieku kustību, pilsētu un kultūras atdzimšanu. Katedrālēm altārdaļa bija neliela, bet klostera baznīcām, pagarinot sānjomus, altārdaļa ieguva neparastus izmērus. Lielajās abatijās izveidoja divus sānjomus, bet sānu apsīdas nodalīja no centrālās arkādes. Svētās Romas pirmais (800–814) imperators (latīņu: *Imperatores Romani Sacri*, vācu: *Römisch-deutscher Kaiser*) Kārlis Lielais ar Sv. Benedikta (ap 480–547) formulētā mūku kopienas dzīvesveida reglamenta *Regula Benedicti* (ap 540) palīdzību radīja klosterus impērijas pārvaldes sistēmai. Latīņu krusta plānojuma bazilikās 10. gs. rūpīgi veidoja trīsapsīdu austrumgalu dievkalpojumu norisēm, transepta dienvidu plecā bija ieeja mūkiem. Rietumu fasādē galvenās ieejas katrā pusē uzcēla torni. Ekonomikā, reliģijā un laicīgā politikā nozīmīgie klosteri, izmantojot ietekmi sabiedrībā, ļoti sarežģītas evolūcijas gaitā radīja Rietumeiropā jaunu klostera baznīcas tipu.

Francijā benediktiešu mūki, kuri kritizēja tieksmi pēc greznības un nevēlēšanos strādāt grūtus darbus, izveidoja Cisterciešu ordeni (*Ordo Cisterciensis*), kur izteikts bija Marijas kults. Mācības pamatā lika pašpietiekamību – mūkiem iztiku bija jāiegūst no roku darba, zemkopības un lopkopības. Klosterim bija nepieciešams, lai tālu no laicīgo ļaužu dzīvesvietām tam piederētu ūdeņi, meži, dzīvnieki, pļavas un tīrumi. Pirmo cisterciešu klosteri, dēvētu par Jauno klosteri (latīņu: *Novum Monasterium*), dibināja 1098. gadā apdzīvotā vietā *Côte d'Or* un uzturēja ar lauksaimniecību un alus darīšanu. Cistercieši piekopa vienkāršu dzīvesveidu, ievēroja gavēni, strādāja lauku darbus un cēla pie upēm – enerģijas avota – ļoti pieticīgas klostera ēkas pamatvajadzību nodrošināšanai: viensētā atradās kapela un koka ēka ar guļamistabu, ēdamtelpu un virtuvi. *Bernardus Claraevallensis* (1090–1153) dibināja vienu no Francijā lielākajiem cisterciešu klosteriem – *Fontenay* abatiju (1118). Pāvests (1119–1124) *Calixt II* apstiprināja regulu *Charta Caritatis* (1119) un izvirzīja prasības Jaunā klostera telpu izvietojumam un funkcionālajai organizācijai: klosterus aizliedza dibināt pilsētās, pie saimniecībām un pilīm. Būvēt atļāva tikai klostera teritorijā, kur bija jāatrodas dārzam, amatnieku darbnīcām, ūdens avotam, mājokļiem, kapelai, telpām ēdināšanai un viesu uzņemšanai. Pēc benediktiešu klostera baziliku plānojuma parauga cistercieši *Clairvaux* klosterī 1135. gadā sāka celt baziliku. *Bernardus* kritizēja pārāk garo un plato celtni, neatļāva tajā izvietot dārgas gleznas, vitrāžas un skulptūras, kas lūgšanu laikā traucē koncentrēties, grīdas nedrīkstēja būt daudzkrāsainas. Atļāva novietot Glābēja Kristus portretu. Cisterciešu baznīcām aizliedza būvēt mūra zvanu torņus. Aizguvis ideju no sengrieķu mājokļiem, kur telpas rindoja ap portika ietvertu atklātu četrstūra pagalmu (latīņu: *peristylium*), *Bernardus* radīja funkcionālu shēmu cisterciešu klostera kompleksa būvniecībai: kluatra ziemeļpusē izvietoja dievnamu, rietumos – celles, dienvidos – refektorijus, bet austrumos – sakristeju, bibliotēku un citas telpas. Cisterciešiem dāvāja zemesgabalus un bagātības. Pieļaujot atkāpes no sākotnējiem principiem, mazinājās atšķirības starp cisterciešiem un benediktiešiem. Pēc *Bernardus* nāves cisterciešu klosteru celtņu konstrukciju izmērus palielināja.

Svētās Romas impērija 12. gs. vidū kristietību sāka izplatīt Baltijas jūras dienvidu piekrastes rietumslāvu, baltu un Baltijas somu zemēs. Kolonizācijai dibināja baznīcas, klosterus un pilsētas. Bruņiniekiem, iebraucot un izbraucot no Livonijas, par svarīgu atbalstvietu kļuva Daugavgrīvas (vācu: *Alt-Dünamünde*) cisterciešu klosteris stratēģiski nozīmīgā vietā netālu no Rīgas ostas. Leales (*episcopatus Lealensis*) jeb Igaunijas bīskapijā (*Episcopatus Estiensis* vai *episcopatus de Hestia*; 1211–1224) uzcēla bīskapa rezidenci (1220–1238) – reljefam pieskaņota aizsargmūra pagalma pusē piebūvēja ēkas, izveidojot sētu, bet Leales (igauņu: *Lihula*) pilsapmetnes tuvumā uzcēla cisterciešu klosteri. Tērbatas bīskaps (1224–1248) *Hermann von Buxhövden* dibināja Karknas

cisterciešu klosteri (*kloster Kärkna*, 1233/1234–1558), kur ap iekšpagalmu izkārtotie taisnstūra plānojuma korpusi radīja cietoksnim līdzīgu celtni. Pāvests (1254–1261) Aleksandrs IV 1255. gada 2. augusta vēstulē minēja Rīgā vietu pie Sv. Jēkaba baznīcas, lai pilsoņu neprecēto meitu un atraitņu aprūpei ierīkotu cisterciešu klosteri, un norādīja klostera privilēģijas un piešķirto *Regula Benedicti*. Klostera ierīkošana saistāma ar 1257. gada 1. maiju. No Sv. Jēkaba baznīcas ieejas uz rietumiem Sv. Marijas Magdalēnas baznīca un ēkas veidoja klostera sētu ar dalījumu divās funkcionāli atšķirīgās zonās. Cisterciešu klosteris kopš 1256. gada pastāvēja Kokneses pilsapmetnē, kura 1277. gada 13. jūlijā ieguva Rīgas tiesības. Limbažos pirms 1450. gada dibināja Sv. Annas klosteri cisterciešu mūķenēm. Kulmas Vecpilsētas ziemeļrietumu stūrī pie aizsargmūra (13. – 15. gs.) Vistulas labajā krastā cisterciešu mūķenēm uzcēla Žēlsirdīgo māsu klosteri (poļu: *Zespół klasztorny Sióstr Miłosierdzia w Chełmnie*; 1261, 1280–1330) un Sv. Jāņa Kristītāja un Sv. Jāņa Evaņģēlista baznīcu (poļu: *kościół śś. Jana Chrzciciela i Jana Ewangelisty*; 1280–1330). Livonijā biežo karu dēļ cisterciešu klosterus mūku-bruņinieki izmantoja aizsardzībai un patvērumam.

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Impact of Dominican and Franciscan Monastery Complexes on Urban Planning Development in the Livonia Confederation and the State of the Teutonic Order

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Abstract. The Augustinians (Latin: *augustiniani*) lifestyle was determined by the *Regula Sancti Augustini*, developed in compliance with St. Augustin's concept, created in the 8th century, but supplemented in the 9th century with a condition that monks have to live together in monasteries (Latin: *abbatia*). Augustinians preached that the power of the church is dominant over the secular and invited to eradicate the ones who thought in a different way. In the first half of the 12th century, Augustinians founded monasteries' schools for sons of noble families. In cities, there were no places for worship. Inhabitants had to travel far in order to reach a monastery. In 1183, in the nearby *Bexhövede* Village foundations were laid for St. John the Baptist's Church. The church was consecrated by Bremen Archbishop Siegfried I (around 1132–1184). Albrecht von Buxthoeven (1165–1229), who participated in the church foundation, started here his clergy journey, but, after becoming Bishop of Riga (Latin: *Adalbertus Canonicus Rigensis*), he laid the foundation-stone for Riga Cathedral on July 25, 1211.

In 1214, Augustinian Canon Domenico di Guzmán (1170–1221) and some monks in Toulouse founded the religious organization the Order of Preachers (Latin: *Ordo Praedicatorum*) or the Dominican Order. In Rome on the Aventine Hill the Dominicans (Latin: *praedicatores*) main church – Basilica of Santa Sabina (422–432) was consecrated. Dominicans, which were not allowed to own secular properties, did not look for seclusion. In cities, monasteries were established and care of the poor was taken. It was considered that monasteries did not need any riches. Monks had to provide their subsistence with work, but if it was not sufficient, they had to ask for alms. Dominican monasteries built for the Baltic land subjugation were the place of residence for monks in order to bring urban population to Christianity and to promote their education.

In 1211, in Akona the Italian poet Giovanni Francesco di Pietro di Bernardone (1182–1226) started his missionary work. He, following the call to become a Catholic monk, founded the Franciscans Order and wrote the *Regula Bulata* (1209), which Pope confirmed in 1223. On March 18, 1212 Franciscus Assisiensis and Clara Assisiensis (1193–1253) founded the poor sisters' Order of Saint Clare (Latin: *Ordo Sanctae Clarae*). People obtained a spiritual power supply, but the monks-beggars' monasteries in medieval cities became important. Churches became accessible to inhabitants of city. Franciscan monasteries in the Baltic lands were places of residence for monks in order to bring the urban population to Christianity.

Keywords: Augustinians, Dominicans, Franciscans, Livonia, monastery church, State of the Teutonic Order

Introduction

The Holy Roman Emperor (1133–1137) Lothar III (*Lothar von Supplinburg)* used as a sample the Neumünster Novum Monasterium Church (1127) with the transept and a massive tower (Fig. 1), founded by Oldenburg and Holstein bishop Saint Vicelinus (1086–1154), and established under the Bremen Metropolis subjugation the Segeberg Augustinian Monastery (German: *Augustinerkloster Segeberg*; 1134–16th cent. 2nd half) near the Port of Bremen (German: *Bremerhaven*). The building complex included St. Mary's Church (1156) with a high tower (Fig. 2) [4, *335*]. Around 1500 before reformation, Augustinians founded a monastery in Lemsal (Latvian: *Limbaži*) [1, *200*].

Dominicans were not allowed to build churches taller than 30 feet, creating stone arches, except above the altar part and scarcity. People in cities built churches, rebuilding even sheds. Dominicans' homes were modest, and the place for worship was also arranged in the bedroom [8, *205*]. Bishop of Riga Albrecht initially was envisaged to be built Riga Cathedral in laconic building forms (Fig. 3). Riga developed on the bank of the Rīdziņa (*Rising*) River. Later Šķūņa-Skārņu Street was created. First of all, there were built four yards one after the other – for the bishop, Bothers of the Sword, Canonical Chapter (later the buildings of the Franciscan monastery) and merchants. In 1206, in the place of the Large Guild (Latvian: *Lielā Ģilde*), 6 Amatu Street the bishop's St. Mary's (*eccesia beate Marie*) Cathedral, which, possibly was a wooden building (burnt down on March 4, 1215), together with the Canonical Chapter in the same building or in its annex (*monasterium*). In Riga centre next to the bishop's first yard the Brothers of the Sword St. Georgi's yard was built, and Germans established secular and spiritual power centres, political and economic diarchy and a fortified principal military economic base for the expansion in the Baltics. Defensive walls (*murum civitatis*), mentioned for the first time in 1207, made the town unassailable, but in summer 1208 they were raised. Between 1211 and

Fig. 1. The overview drawing of Neumünster Novum Monasterium Church.
[http://www.vicelin-kirche-nms.de/fileadmin/_processed_/csm_geschicht_kirche_00c22cd821.jpg]

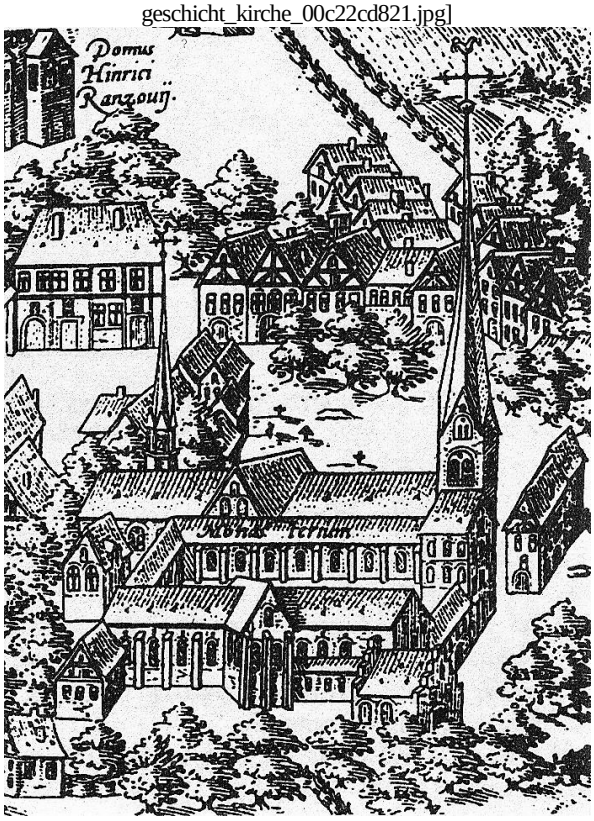


Fig. 2. The drawing of Segeberg Augustinian monastery St. Mary's Church [4, *335*]

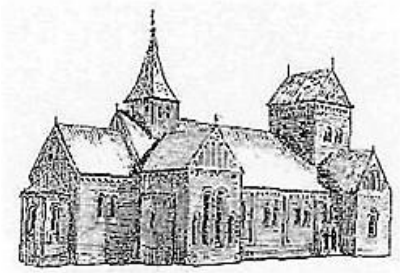


Fig. 3. Wilhelm Neumann. The reconstruction drawing of St. Mary's Cathedral in Riga [online 19.06.2017, source: http://www.doms.lv/resources/rekonstrukcija01_350.jpg]

1215 on the outside of defensive walls the construction of second bishop's yard, as well as the Riga St. Mary's Cathedral (Latvian: *Rīgas Doms*) and at least an abbey for the Canonical Chapter, which lifestyle was determined by the *Regula Sancti Augustini*, was started [1, *252*]. In the 13th century, the Cathedral's congregation room was built. On the south side cloisters surrounded the cloister courtyard, but the eastern block was built for the complex. On the ground floor there was a store room and the Chapter Hall, but on the top floor – bedrooms. Later the south block with the kitchen and household rooms, and the western block for the Latin School were built [11, *31*]. The fourth – north block was also planned. Till 1547, the three-storey square planning tower in the middle of the western transept (14th cent.) was covered with a pyramidal steeple. The front-hall plan confirms the initial intention to build two towers on the western façade [1, *254–255*]. In 1425 the pope awarded Dominicans the rights to real estate. Next to the defensive wall the planning of the Riga Archbishopric Centre was made up of two urban structures. The Riga Bishop's second yard perimeter structure with the sacral building, included in it, reminded of the Roman Bishop's residence solution on the Lateran Hill in Rome, but the Riga Cathedral complex consists of the abbey and the Cathedral. In the Old Town of Bremen Dominicans built the Monastery of St. Catherine (German: *Dominikanerkloster St. Katharinen*; 1225). In Lübeck, commemorating the victory in the *Bornhöved* Battle, which happened on Mary Magdalena's Day on July 22, 1227, the Monastery of St. Mary Magdalena (German: *Maria-Magdalenen-Kloster*; 1229) was founded northwards from the Old Town, where a small hall church was built. After the fire in 1276 the Castle-monastery (German: *Burgkloster*; after 1276–1401) was built again and the abbey church was named after Mary Magdalena. The building was rebuilt and extended on multiple occasions, and around 1399–1401 the basilica obtained a new triple-nave room (German: *Hallenchor*) and a representative façade directed towards Castle (German: *Burgstraße*) Street. In 1236, in Hamburg not far from Franciscan *St. Marien-Magdalenen-Kloster* Dominicans founded the Monastery of St. John (German: *Dominikanerkloster St. Johannis*; 1236–1529). The spiritual power centre was established.

In Assisi the construction of San Rufino Cathedral (Italian: *Cattedrale di Assisi*, *Cattedrale di San Rufino di Assisi*; 1140–1253) [12, *246*], designed by architect Giovanni da Gubbio for the martyr, Bishop Rufino (3rd cent.), was started. Franciscus Assisiensis was canonized. Pope (1227–1241) Gregorius IX consecrated a high altar in San Rufino Cathedral, where Franciscus Assisiensis was worshipping. On July 17, 1228 in Sacro Convento (Italian: *Il Sacro Convento di San Francesco in Assisi*) the foundation stone was laid for the single-nave Basilica of St. Francis of Assisi (Italian: *Basilica Papale di San Francesco*, Latin: *Basilica Sancti Francisci Assisiensis*) with the transept. The visible part of the two-storey building was made on the hill, but the lower part with chapels and crypts was enclosed by

Fig. 4. St. Francis of Assisi Basilica's lower floor plan with chapels at the transept's ends, on right and left sides of the nave and at the nave's west end. 2007 [online 19.06.2017, https://upload.wikimedia.org/wikipedia/commons/a/a5/План_нижней_церкви_Ассизи.jpg]

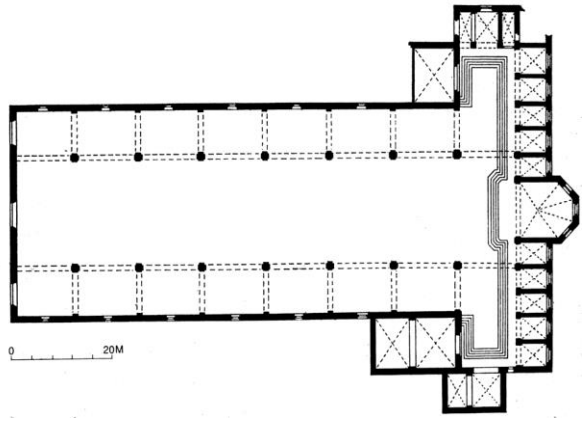


Fig. 5. Italian architect, sculptor Arnolfo di Cambrio (ap 1240–1300/1310). The T-type plan of Franciscan monastery Basilica of the Holy Cross in Florence [online 19.06.2017, http://www.oberlin.edu/images/Art336/366-0402.JPG]

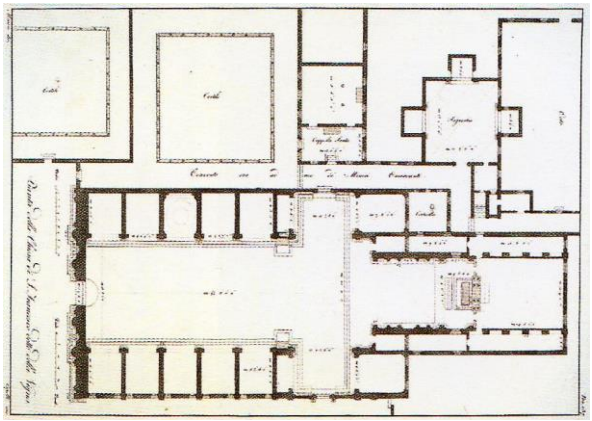


Fig. 6. Italian architect, sculptor Jacopo d'Antonio Sansovino (1486–1570). The plan of Franciscan monastery San Francesco della Vigna Church in Venice. 1534. [online: 26.06.2017, http://www.churchesofvenice.co.uk/sanfrandellav14.jpg]

the monastery (Fig. 4). The main Franciscans Church obtained the status of Major basilica (Latin: *Basilica maior*).

In Florence, on May 12, 1294 instead of the oldest church the construction of the principial Franciscan church in Italy, possibly designed by architect, sculptor Arnolfo di Cambio (1240–1300/1310), was started. The T-type plan of Basilica of the Holy Cross (Italian: *Basilica di Santa Croce*; 1294–1385) (Fig. 5) is similar to the plan of the oldest St. Peter's Basilica in Rome. On the left side of the main nave there are *Galileo Galilei* and *Desiderio da Settiganano's* tombs, on the right side – *Michelangelo Buonarroti*, *Vittorio Alfieri*, *Niccolo Machiavelli*, *Gioachino Rossini* and *Ugo Foscolo's* tombs, but at the end – the choir, apse with the main altar and a line of chapels. In the north-west corner the *Bardi di Vernio's* Chapel with the crucifix, made by the sculptor *Donatello* (*Donato di Niccolò di Betto Bardi*; around 1386–1466)**,** was placed. On the left of the main altar *Bardi di Vernio*, *Pulci-Berardi*, *Ricasoli*, *Capponi*, *Spinelli's* Chapels are situated, but on the right – *Bardi*, *Peruzzi*, *Giugni*, *Calderini*, *Velluti's* Chapels were created [17, *43*]. In 1442, Pope (1431–1447) Eugenius IV consecrated the church.

In Venice, at 1223, Franciscans settled in existing monastery on the city's outskirts. On 28 April 1250 the cardinal Ottaviano or Attaviano degli Ubaldini (1214–1273), the first stone was laid for the new, second church, dedicated to Santa Maria Gloriosa. In the vineyard, which was donated by Marco Ziani in 1253, the monastery was made. Franciscans started to build a small church *Santa Maria de' Frati Minori*, consecrated in 1280. With the increasing role of the Franciscans, a new building for the church was required, and, begun in 1330 by an unknown architect. In 1396, the campanile, the second tallest in the city after that of San Marco, was completed by architects Jacobello dalle Masegne (1350–1409) and Pier Paolo (till 1383–1417) dalle Masegne. May 27, 1492 the Basilica di Santa Maria Gloriosa dei Frari was consecrated. On August 15, 1534 instead of the former chapel, the foundation stone was laid for San Francesco della Vigna Church (1253, 1534–1554) with an extended chancel (Fig. 6), designed by the architect, sculptor Jacopo d'Antonio Sansovino (1486–1570) from Florence.

Previous researches on monastery churches in Western Europe: in Georg Dehio's and Gustav von Bezold's "*Kirchliche Baukunst des Abendlandes*" [3], issued in Stuttgart 1887–1901, graphical materials of cult buildings – plans, cuts, façade drawings have been collated, In Rolf Toman, Alan Bednorz and Barbara Borngässer's book "Cathedrals and Churches of Europe" (2015) [12] broad information on churches and cathedrals in Europe has been included.

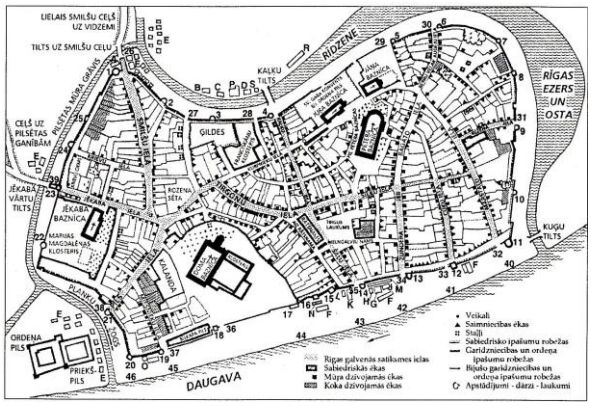
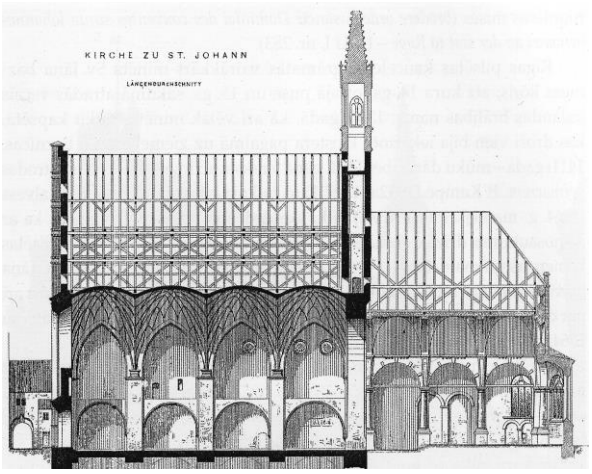


Fig. 7. The Riga Archbishopric Centre buildings in Riga plan around 1500 [11, *154–155*]

a



b

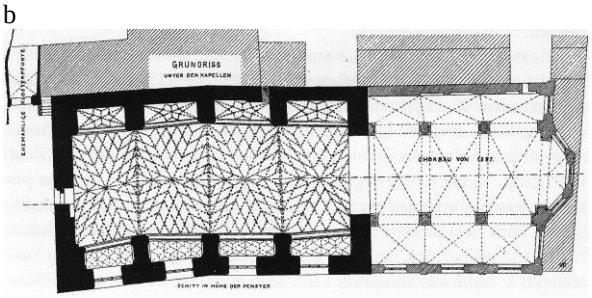


Fig. 8. Wilhelm Neumann. Riga St. John the Baptist Church: a – a longitudinal section, b – a plan. 1892 [1, *270–271*]

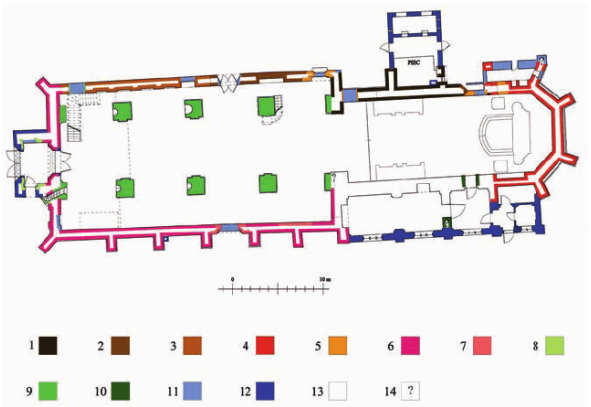


Fig. 9. Development periods of Dominican monastery Kulm St. Peter and St. Paul's Church plan. 1907 [9]

Previous researches on monastery churches in Livonia: the famous fortress researcher in the Baltics, Estonian historian of art, Professor of Tartu University Dr. phil. Armin Tuulse (1907–1977) has collated the data on abbey buildings in Estonia and Latvia in the edition "*Die Burgen in Estland und Lettland*" (1942) [13]. The outstanding Latvia historian, prof. emeritus Dr. Indriķis Šterns (1918–2005) of Muhlenberg College, US has included the information in the monographs "*Latvijas vēsture. 1290–1500*" /History of Latvia. 1290–1500/ and "*Latvijas vēsture. 1180–1290. Krustakari*" /History of Latvia 1180–1290. Crusades/ in the edition "*Senā Rīga*" /Ancient Riga/, issued by Latvia Institute of History. Some information can be found in the article "*Daži mazāk pazīstami seno mūra celtņu fragmentu atradumi Vecrīgas apbūvē*" /*Findings of a few less known ancient stone building fragments in Old Riga construction*/ (2001) [5] by the Science Academy Honorary Doctor, architect Gunārs Alfrēds Jansons (1928–2013) on St. Catherine's Church and findings in the territory of the Franciscan Abbey. The encyclopaedia "*Latvijas 12. gadsimta beigu – 17. gadsimta vācu piļu leksikons*" /Lexicon of late 12th – 17th century German Castles in Latvia/ (2004) [2] compiled by archaeologist prof. Dr. habil. hist. Andris Caune and Dr. Ieva Ose has been published into series of books "*Latvijas viduslaiku pilis*" /Medieval Castles in Latvia/, but "*Latvijas viduslaiku mūra baznīcas. 12. gs. beigas – 16. gs. sākums*" /Medieval stone churches in Latvia . Late 12th cent-early 16th cent./ (2010) [1] is an encyclopaedia, which includes broad information. Prof. Dr. hist. Ilgvars Misāns and asoc. prof. Andris Šnē of Latvia University History and Philosophy Faculty have prepared materials for seminars in Medieval History of Western Europe "*Klosteris, pils un pilsēta*" /Abbey, Castle and City/ (2004) [8]. In the book "*Rīgas dievnami. Arhitektūra un māksla*" /Churches of Riga. Architecture and Art/ joint the article "*Svētās Katrīnas baznīca*" /St. Catherine's Church/ by Dr. arch. Jānis Zilgalvis (b. 1955) and Marina Levina (b. 1954), architect of National Inspectorate for the Protection of Monuments, has been included (2007) [16]. **Previous researches on monastery churches in Prussia:** historian Zbigniew Nawrocki's publication "*Pofranciszkański kościół NMP w Toruniu. Próba rekonstrukcji dziejów budowy*" (1966) [9] dedicated to the theoretical reconstruction of Torun Franciscan Church, and the specialist of architecture and art history Piotr Samól has analysed building of the Culm Dominican Church in the research "*Architektura kościoła podominikańskiego pw. św. św. Piotra i Pawła w Chełmnie w świetle badań z lat 2010–2013*" (2013), but Dr. Liliana Kranz-Domasłowska (b. 1954) has included the information on abbey churches in the

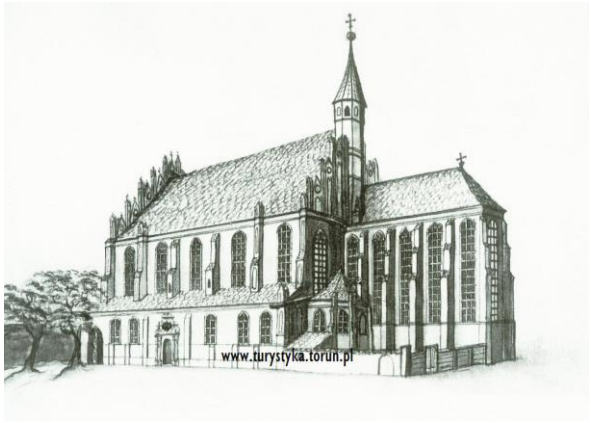


Fig. 10. The overview of Dominican monastery St. Nikolay Church in the New Town of Thorn. 1743 [10]

research about double cities "Double cities in the Teutonic state on the example of Toruń" (2013) [6].

Research problem – the impact of medieval monasterys' complexes on the origins of Livonian and Prussian urban environment and building formation has been studied insufficiently. **Research novelty** – the identity of Livonian and Prussian monastery churches' architecture and impact of fortified building complexes on the urban environment formation origins in the Baltic during the 13th–14th century have been analysed in regional and European context. **The goal of the research** – analyse the peculiarities of architecture and planning of monastery churches, as well as the influence of monastery complexes on the establishment of the Teutonic Order's fortified power centres and town planning of Livonia and Prussia during the 13th and 14th centuries in order to determine the common and different characteristics. **Main methods applied** – inspection of the buildings in nature, analysis of archive documents, projects and cartographic materials.

The Dominican monastery church planning and structure in the Livonia confederation and the State of the Teutonic Order

On September 8, 1234, Bishop of Riga (1229–1253) Nikolaus von Nauen (Latin: *Nicolaus Canonicus Rigensis*) presented the first Riga bishop's yard with the stone residence, which possibly damaged in the fire on March 4, 1215, and the plots of land belonging to it to Dominican monks. They could settle down by the Rīdziņa (*iuxta Rygam in antiqua civitate*) and preach Christianity in Livonia [2, 392]. In the place of the Riga Bishop's first yard by defensive walls monks founded the Dominican monastery (1234), separated from the Order's properties by the frontier fortifications. The layout of the church and abbey buildings (Fig. 7) created a functional division for the fortified territory. In 1297, the church was mentioned for the first time as St. John the Baptist Church [1, *269–270*] (Fig. 8a): its altar occupied partly the chapel's place of the residence, but the apse was made next to building's basics (Fig. 8b). Cloisters surrounded the courtyard.

In the Old Town of Kulm, which was placed in a geographically different place from the current *Starogrod Chełmiński*, Dominicans, possibly arriving in 1233, set up the abbey and started construction of St. Peter and St. Paul's Church (Polish: *kościół św. Piotra i św. Pawła w Chełmnie*) (Fig. 9), which was completed in the fourth quarter of the 13th century. During the first building period the oratory of a low rectangular planning was made, from which a piece of the chancel's north wall has been preserved, but soon after that in the first quarter of the 14th century the hall was built. During the second construction period instead of the partly destroyed oratory a square chancel was made (around 1330–1338), to which the closing behind the hexagon planning of the arch was decorated with blind windows in the plaster. Around 1340–1350 changes were made in the chancel, the abbey was increased and the church was linked to the abbey in three new places. In the third quarter of the 14th century on the north side of the building a very narrow passage was made. From the third quarter of the 14th century till 1390 during the third building period a two-storey construction volume was built, whose northern wall partly included the fragment of the hall built in the early 14th century. The western façade of the triple-nave church was added to the asymmetric two-nave hall with six niches. Building was completed in three stages and the course of construction was conceptually changed. When the building was covered with the roof, the façade was supplemented with the corona part. In the late 14th century building was not any longer developed, but the floor was covered with ceramic materials. In the early 15th century the interior was painted [9]. Similarly, the Dominican monastery church was built in Thorn (Polish: *Toruń*), where the number of inhabitants and economic potential increased, and separate privileges were awarded to the Old and New Towns of Thorn. Both communities obtained complete independence, and each of them created their own legal, individual urban constructional formation. On April 2, 1263 Dominicans (Polish: *Ojców Kaznodziejów św. Dominika*) arrived in the New Town of Thorn and in the north-west corner of the both towns' border territory built monastery, financially supported by bishop of Kulm. Complex was supplemented with the biggest church in the New Town of Thorn – the triple-nave St. Nikolay Church (Polish: *kościół św. Mikołaja i klasztor dominikanów*; 1334, destroyed in the middle of the 19th cent.) (Fig. 10) with a deep chancel (1334–1343), which had a polygonal closing and the sacristy built on the north side. The plan (1743) of Dominican monastery St. Nikolay Church includes mortuaries (Polish: *św. Marii Magdaleny*, *św. Dominika*, *św. Róży*, *św. Jacka*, *św. Pana Jezusa*,

Fig. 11. Conrad Emanuel Steinbrecht. Overview of the Most Holy Virgin Mary's Church in the Old Town of Thorn. 1885 [10]

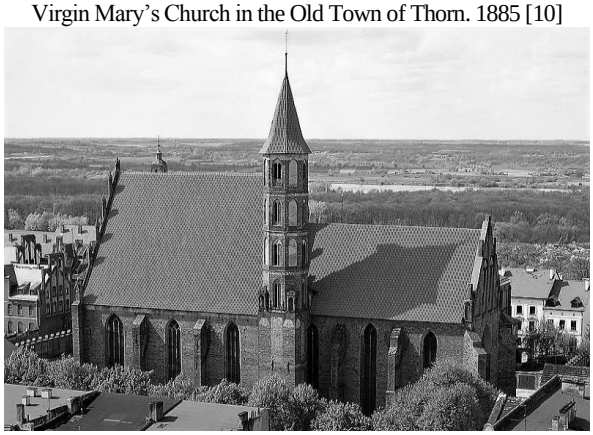


Fig. 12. Photographer Margoz. Overview of Franciscan monastery's St. Jacob and St. Nikolay's Church in the Old Town of Kulm. 2008 [online 19.06.2017, http://upload.wikimedia.org/wikipedia/commons/e/eb/Che%C5%82mno_Church_of_St_James_and_St_Nicholas.jpg]

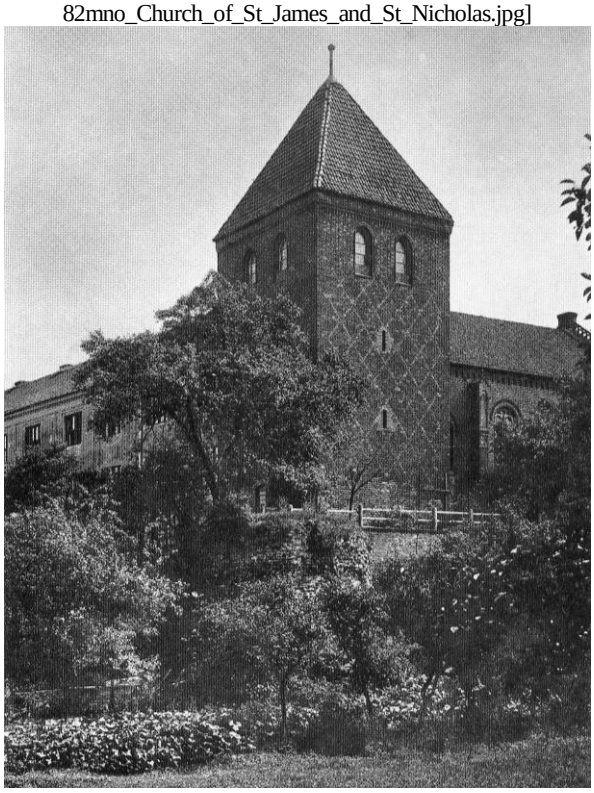


Fig. 13. The Franciscan monastery church close by the tower of Braunsberg defensive wall (the second half of the 14th cent.) [14, *151*]

św. Barbary, *św. Walentego*, *św. Józefa*) [6]. In the Old Town of Elbing (Polish: *Elbląg*) Dominican monastery was situated in the north-west corner of the defensive wall [6].

The Franciscan monastery church planning and structure in the Livonia confederation and the State of the Teutonic Order

The barefooted (*barvûzen*) or Minorites (Latin: *minoritae*, *fratres minores*) were forbidden to have either private property. The "Orders of beggar-monks" did not have any money, and they had to sustain themselves from voluntary donations, therefore initially people in cities built very simple churches, without applying architectonic forms typical to cathedrals. Franciscans also arrived in German lands. In the Old Town of Bremen the Monastery of St. John (German: *Franziskanerkloster St. Johannis*; 1225) was made, but in Hamburg – St. Mary Magdalena's Franciscan Monastery (*franziskanische St. Marien-Magdalenen-Kloster*; 1227, 1235–1529). In 1225, a plot of land was allocated to Lübeck Franciscans from Magdeburg on the corner of *Glockengießerstraße* and *Königstraße* Streets in order to establish the Monastery of St. Catherine (*Katharinenkloster*; 1225–1531). Burgomaster Segebodo Crispin (?–1323) donated funds for the construction of the triple-nave St. Catherina's Basilica (German: *Katharinenkirche*, *St. Katharinen zu Lübeck*; 1300–1330). Northwards from the ambulatory (Latin: *ambulatorium*) – a circular passage around the choir – a chapel for his family (German: *Familienkapelle*, *Crispinkalelle*) was built. The chancel was made to the church with a polygonal closing (1329) and nave (1335).

In 1356 building work was completed. In Danzig by the market St. Catherine's Church (Polish: *kościół św. Katarzyny*; 1227–1239) was built, and Franciscans founded the Monastery of St. Brigitte's Sisters (German: *St. Brigitten-Büßerinnen-Kloster* zu *Danzig*). Building of St. Brigitte's Church (*St. Brigitten Kirche*, poļu: *kościół św. Brygidy*; around 1350) was started on the east side of St. Catharine's Church. In outskirts of Danzig the Franciscans monastery complex was created.

In Kulm land (Polish: *Chełmno land*, German: *Kulmerland*) Franciscans established the first convent (1239) towards north-west outside the Old Town of Thorn, where in the middle of the 13th century the church of a rectangular planning was built. During the second stage of construction, an elongated chancel with a polygonal finish clung to the simple wall of the eastern end. The western part of the church had an asymmetric nave. During the 13th–14th century the church and abbey were extended (1350–1370): the Most Holy Virgin Mary's Church (Polish: *kościół Wniebowzięcia Najświętszej Marii Panny*, 1270–1300, 1557–1724, 1724–1821) was made with a nave,

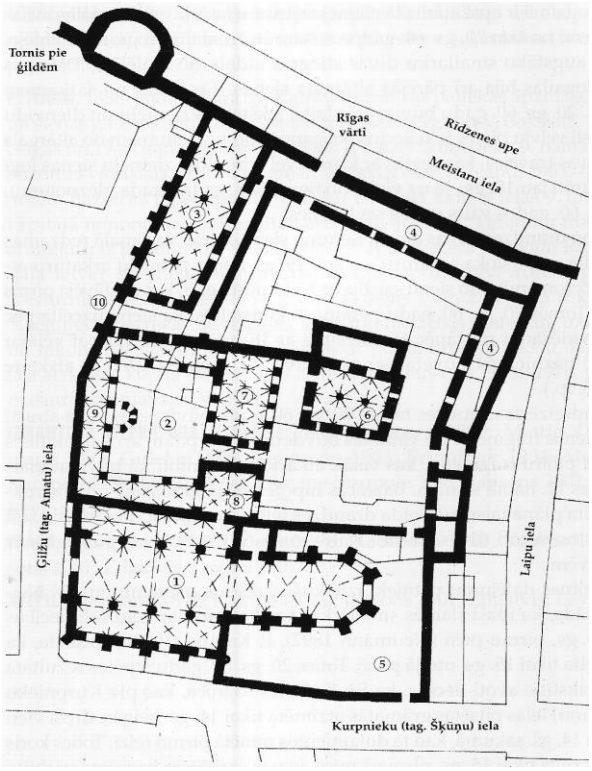


Fig. 14. Architect Gunārs Jansons (1928–2013). The reconstruction drawing of Riga Franciscan monastery St. Catherine Church plan: 1 – St. Catherine's Church (the second half of the 13th cent.) with the annex of the choir (the 15th cent.), 2 – courtyard, 3 – the first chapel (?) (the first half of the 13th cent.), 4 – monastery stables (1330), 5 –cemetery of monastery (1396), 6 – old refectory (?), 7 – refectory with dormitory, 8 – the Canonical Chapter Hall, 9 – cloister, 10 – the Guild Gate (1336) [5, *331*]

covered with a ridged roof, without the main tower, whereas with an asymmetric hall and narrow windows. The construction volume of the chancel was supplemented with three towers of an octagonal planning, out of which the middle one was bigger (Fig. 11) [7].

Instead of the oldest church (3rd quarter of the 13th cent. – 1st quarter of the 14th cent.) in the western part of the Old Town of Kulm Franciscans built St. Jacob and St. Nikolay's Church (German: *die Kirche St. Johanne des Taeufers und Johannes des Evangelisten*, Polish: *kościół św. Jakuba i św. Mikołaja*; 1326) of a triple-nave hall with a rectangular chancel (Fig. 12), to which on the south side there was a narrow tower of an octagonal planning. The main nave was covered with ribbed vaults, but the narrow side-passages – with star vaults. Buildings of the abbey were placed northwards from the church. In Braunsberg (Polish: *Braniewo*), surrounded with the defensive wall, Franciscans built the complex of the abbey's buildings in the north-west corner of the town (Fig. 13).

In Riga, Franciscans had already been since 1233, but in 1258, the Monastery of St. Catherine (existed till reformation) with a stone house [1, *308*] was mentioned for the first time. Cloisters separated the northern part of the courtyard with the oldest buildings – the chapel (1st half of the 13th cent.) and, possibly, the old refectory, from the cloister courtyard of St. Catherine's Church, built on the south side of the street in the late 13th century or early 14th century. A functionally diverse two-division plan was created. The refectory with dormitory and the Chapter's Hall closed the eastern side of the yard surrounded with cloisters. The monastery stone church was situated on the piece of land, most probably instead of the Canonical Chapter at the Riga defensive wall not far from the gate. Six octagonal pillars supported the valves of St. Catherine's Church triple-nave hall with an elongated chancel. The gate of the abbey's entrance took into the yard, where in 1330 stables with the guard's pass were built [5, *124*]. The city inhabitants used St. Catherine's Church, and in 1396 a cemetery was created nearby (Fig. 14) [1, *311*].

Franciscan monasteries were in all towns of Riga Archbishopric: on the outskirts of Lemsal northwards outside the defensive wall a monastery [1, *198*] and stone castle [1, *33*] were built from 1466–1472. In Kokenhusen, the abbey, which clung to the inner side of the city's defensive wall, still worked in 1522. On the east side of town not far from the defensive wall there was also a Catholic monastery Church with a tower [1, *33*]. However, it is possible that during the Russian invasion in 1577 the abbey's buildings and church, whose tower was a significant orienteering, were destroyed [1, *167–168*]. In Fellin (Estonian: *Viljandi*) the Franciscan monastery (1466–1472, closed in 1560) was founded near St. John and St. Clara's Church. Archbishop of Riga (1484–1509) Michael Hildebrand (Latin: *Michael Hiltebrant*) allowed Franciscans to found an abbey in Kursa (Latin: *Curonia*). Since 1484 northwards from Hasenpoth (Latvian: *Aizpute*) the Monastery of St. Clarissa (burnt down in 1523) was formed for Franciscan nuns [15, *57*].

Conclusions

1. In Livonia and in the State of the Teutonic Order, Dominican and Franciscan monasteries were founded in towns, affected the medieval construction. The Riga Archbishopric Centre building complex consisted of two yards – the bishop's yard with a perimeter construction and the Canonical Chapter's yard with the Dominican abbey's building complex, in which the cathedral was included. In Riga, in Dominican monastery the chancel of St. John the Baptist's Church was deep, for it partly occupied the place of the bishop's residence chapel. In the Old Town of Kulm the Dominican's monastery St. Peter and St. Paul's Church and in the New Town of Thorn the triple-nave St. Nikolay's Church had an

asymmetric two-nave hall covered with a ridged roof. A deep chancel with a polygonal closing to which in the north the sacristy was built. In the eastern side the slightly shorter south nave, where there were secondary worship places, was closed with a polygonal chapel (Polish: *kaplica św. Jacka*). The abbey's rooms were placed on the north side.

2. In Livonia and the State of the Teutonic Order, Franciscan monasteries was usually allocated near the defensive wall of the town. In fortified Braunsberg the Franciscan monastery with the church were situated in the north-west corner of the town's defensive wall. The corner tower was included in the monastery's building complex. In the western part of the Old Town of Kulm the triple-nave St. Jacob and St. Nikolay's Franciscan Church had a deep chancel, to which a tower was built on the south side. Monastery's buildings were placed northwards from the church. Also in Riga, the triple-nave St. Catherine's Church had an elongated chancel and monastery's buildings were arranged northwards from the church.

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Kopsavilkums. Pilsētās nebija lūgšanu vietas, un iedzīvotājiem bija jāpārvar lieli attālumi, lai nokļūtu klostera baznīcā ārpus pilsētas. Augustīniešu kanoniķis *Domenico di Guzmán* (1170–1221) un daži mūki Tulūzā 1214. gadā dibināja reliģisku organizāciju Spredikotāju (latīņu: *praedicatores*) jeb Brāļu Dominikāņu ordeni

(latīņu: *Ordo Praedicatorum*), kam nedrīkstēja piederēt laicīgais īpašums. Dominikāņi netiecās pēc noslēgtības, darbojās pilsētās, kur ierīkoja klosterus, centās iegūt iespējami vairāk piekritēju, aprūpēja par nabagus un slimos. Cilvēki guva garīgu spēcinājumu. Uzskatīja, ka klosteriem bagātības nav vajadzīgas: mūkiem iztika jānodrošina ar darbu, taču, ja ar to būtu nepietiekami, tad jāubago. Dominikāņiem neatļāva celt par trīsdesmit pēdām augstākas baznīcas un veidot akmens arkas, izņemot virs altārdaļas un sakristejas. Baznīcas cēla pilsētnieki, pārbūvējot pat šķūņus. Mūku-ubagotāju klosteri ieņēma viduslaiku pilsētu apbūvē arvien nozīmīgāku vietu. Romā, Aventīna kalnā iesvētīja dominikāņu galveno dievnamu – *Santa Sabina all'Aventino* baziliku. Kulmas Vecpilsētā dominikāņi, iespējams, ieradās 1233. gadā, ierīkoja klosteri un sāka būvēt Sv. Pētera un Sv. Pāvila baznīcu (poļu: *kościół św. Piotra i św. Pawła w Chełmnie*), kuru pabeidza 13. gs. 4. ceturksnī. Tornas Jaunpilsētā dominikāņu mūki ieradās 1263. gada 2. aprīlī un, Kulmas bīskapa finansiāli atbalstīti, uzcēla klostera (poļu: *Ojców Kaznodziejów św. Dominika*) kompleksu, ko papildināja Jaunpilsētā lielākais dievnams – trīsjomu Sv. Nikolaja baznīca (poļu: *kościół św. Mikołaja i klasztor dominikanów*; 1334, nojaukta 19. gs. vidū) ar dziļu altārtelpu (1334–1343), kurai bija poligonāls noslēgums. Elbing (poļu: *Elbląg*) Vecpilsētā dominikāņu klosteris (vācu: *Dominikanerkloster*; 14. gs.) atradās aizsargmūra ziemeļrietumu stūrī. Rīgā laikā starp 1211. un 1215. gadu sāka būvēt bīskapa otro sētu ar palasu, otro Domu jeb Sv. Marijas baznīcu un klosteri Domkapitulam. Otrais Rīgas bīskaps (1229–1253) *Nikolaus von Nauen* (latīņu: *Nicolaus Canonicus Rigensis*) bīskapa pirmo sētu ar mūra mītni, kas, iespējams, cieta 1215. gada 4. marta ugunsgrēkā, un tai piederīgos zemesgabalus 1234. gada 8. septembrī dāvāja dominikāņiem, lai viņi apmestos pie Rīdziņas (vācu: *Rising*) un Līvzemē sludinātu kristietību. Dominikāņi dibināja klosteri (1234), kur Sv. Jāņa Kristītāja baznīcas un ēku izkārtojums nocietinātajā teritorijā veidoja funkcionālu dalījumu un pagalmu. Pāvests 1425. gadā piešķīra dominikāņiem tiesības uz nekustamo īpašumu.

Akonā misionāra darbu 1211. gadā sāka itāļu dzejnieks *Giovanni Francesco di Pietro di Bernardone* (1182–1226), kurš, sekojot aicinājumam kļūt par katoļu mūku, atteicās no materiāliem labumiem, lai dzīvi veltītu Dievam. Viņš dibināja Franciskāņu ordeni un sarakstīja *Regula bulata*, kuru pāvests apstiprināja 1223. gadā. Itālijas pilsētā Asīzē, kur moceklim, bīskapam Rufino (3. gs.) 1140. gadā sāka celt arhitekta *Giovanni da Gubbio* projektēto San-Rufino katedrāli (itāļu: *Cattedrale di Assisi*; 1140–1253), *Franciscus Assisiensis* un *Clara Assisiensis* (1193–1253) 1212. gada 18. martā dibināja nabadzīgo māsu Svētās Klāras ordeni (latīņu: *Ordo Sanctae Clarae*). *Franciscus Assisiensis* tika kanonizēts, un Asīzes Sv. Konventa klosterī (itāļu: *Il Sacro Convento di San Francesco in Assisi*) 1228. gada 17. jūlijā ielika pamatakmeni vienjoma Sv. Franciska bazilikai (itāļu: *la Basilica di San Francesco d'Assisi*). Pakalnā izveidoja divstāvu celtnes redzamo daļu, bet apakšējo daļu ar kapelām un kriptām ieskāva klosteris. Franciskāņu galvenā baznīca ieguva *Basilica majoris* statusu. Florencē 1294. gada 12. maijā senākas baznīcas vietā sāka celt arhitekta *Arnolfo di Cambio* (1240–1300/1310) projektēto, iespējams, Itālijā lielāko franciskāņu klostera dievnamu – T-veida plānojuma Svētā Krusta baziliku (Italian: *Basilica di Santa Croce*; 1294–1385), kuras plānam ir līdzība ar senākās *Basilica Vaticana* plānu Romā. Pāvests (1431–1447) *Eugenius IV* baznīcu 1442. gadā iesvētīja. Baskājiem jeb minorītiem (latīņu: *minoritae*, *fratres minores*) aizliedza privātīpašumu un kopīpašumu. „Ubagotājmūku ordeņiem" nebija naudas, tādēļ bija jāiztiek no labprātīgiem ziedojumiem. Pilsētnieki viņiem sākotnēji cēla ļoti vienkāršas baznīcas. Dancigā pie tirgus franciskāņi uzcēla Sv. Katrīnas baznīcu (poļu: *kościół św. Katarzyny*; 1227–1239), dibināja Sv. Brigitas māsu klosteri (vācu: *St. Brigitten-Büßerinnen-Kloster* zu *Danzig*) un sāka būvēt Sv. Brigitas baznīcu (poļu: *kościół św. Brygidy*; ap 1350). Kulmas zemē franciskāņi pirmo konventu (1239) ierīkoja uz ziemeļrietumiem ārpus Tornas Vecpilsētas, kur 13. gs. vidū uzcēla taisnstūra plānojuma baznīcu, kuru paplašināja (1350–1370): izveidoja ar divslīpu jumtu segtu trīsjomu Vissvētākās Jaunavas Marijas Debesbraukšanas baznīcu (poļu: *kościół Wniebowzięcia Najświętszej Marii Panny*, 1270–1300, 1557–1724, 1724–1821) bez galvenā torņa, taču ar asimetrisku zāli un šauriem logiem. Altārdaļas būvapjomu papildināja trīs astoņstūra plānojuma torņi, no kuriem vidējais bija lielāks. Kulmas Vecpilsētas rietumdaļā senākas baznīcas vietā franciskāņi uzcēla trīsjomu zāles Sv. Jēkaba un Sv. Nikolaja baznīcu (poļu: *kościół św. Jakuba i św. Mikołaja*; 1326) ar taisnstūra altārdaļu, kurai dienvidpusē piekļaujas tievs astoņstūra plānojuma tornis. Galveno jomu pārsedza ribotas velves, bet šaurās sānejas – zvaigžņu velves. Klostera ēkas izvietoja uz ziemeļiem no baznīcas. Aizsargmūra ietvertajā Braunsbergā franciskāņi klostera ēku kompleksu (1296) ar baznīcu uzbūvēja pilsētas ziemeļrietumu stūrī. Rīgā, kur franciskāņi bija sastopami kopš 1233. gada, klostera mūra baznīca atradās zemesgabalā, domājams, Domkapitula sētas vietā pie Rīgas aizsargmūra netālu no vārtiem, pa kuriem nokļuva Daugavas (vācu: *Düna*) labā krasta pietekas Rīdziņas piekrastē. Sv. Katrīnas franciskāņu klosteris pirmo reizi minēts 1258. gadā. Klostera sētas ziemeļdaļu ar senākām celtnēm – kapelas (13. gs. 1. puse) un, iespējams, vecā refektorija – no dienvidpusē ielas malā uzceltās trīsjomu zāles Sv. Katrīnas baznīcas, kuru izmantoja arī pilsētnieki, pagalmu nošķīra krusteja, radot funkcionāli dažādu divdalījuma plānojumu. Krustejas apņemtā klostera pagalma austrumpusi noslēdza refektorijs ar dormitoriju un kapitula zāle. Klostera ieejas vārti veda pagalmā, kur 1330. gadā uzbūvēja staļļus ar sardzes eju. Franciskāņu klosteri bija visās Rīgas arhibīskapijas pilsētās: Limbažu priekšpilsētā uz ziemeļiem ārpus pilsētas mūriem 1466.–1472. gadā uzcēla klosteri un mūra baznīcu, Kokneses pilsētiņas austrumpusē netālu no aizsargmūra bija katoļu klostera baznīca ar torni.

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Hiking in the landscape - the history of Europeans' linkage to the landscape by hiking

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Abstract: since remote times, man has hiked in the landscape, establishing bonds of communication and interconnection between two or more points. Hiking along trails is the means of escape for man, causing changes in the landscape, and making known sites and places. In this paper, the history of the dynamics established between the act of walking and the landscape, along with the changes in society (predominantly since the 18th century), are presented. The existence of paths in nature is older than the very existence of mankind itself. The act of walking has always been associated with the history of man, who has hiked in the landscape looking for food, making pilgrimages, marketing products, promoting sustainable mobility, tourism and healthy recreation, and contributing to the improvement of the population's quality of life. There is a special connection to the landscape by walking. The paths are areas marked by time and by society. They are understood as a way of reading the landscape. The act of walking is associated with an art in which the pleasure is rather in sensations of the soul [37]. When we walk, we are exclusively dependent on ourselves and completely free to observe and appreciate the landscape as best suits us and with a complete tranquility [30; 37]. Knowledge of the landscape involves movement, and the best form of perceiving and establishing a close relationship with that landscape is walking. Nowadays, there is a significant increase in adherence to outdoor activities, especially walking. People are looking for new ways of being in contact with nature. A restorative effect of nature on man is, indeed, one of the fundamental aspects of this increased demand, and people walk for different reasons. Hiking in the natural landscape assumes a great importance for the maintenance of a healthy body and mind. It is important that we develop future research to improve our knowledge not only about the influence of walking in the natural landscape, related especially to the benefits it has on man's creativity, but also to improve the knowledge about how to combine modern life with the benefits of walking in nature.

Keywords: walking and hiking, paths, landscape, well-being, tourism and recreation in nature

Introduction

To hike in the landscape means to establish a relationship of thoughts and sensations with that landscape, resulting in an intuitive mental representation that is derived from the knowledge and experience of the observer. The act of walking is as ancient as humanity itself [23]. However, the motivations for walking in and amongst landscapes have changed through the centuries, fundamentally related to the evolution of society [3; 9; 23; 32; 39].

Since the end of the last century, the demand for "natural" areas in which to practice outdoor activities (and, specifically, walking) has been on the rise. Footpaths are becoming increasingly popular, mainly to urban people, which has led to the increasing deployment of both small and large paths [4; 15; 20; 33; 44]. In recent decades, several studies have related the importance of the act of walking with diverse goals: such as well-being; environmental awareness; tourism; a better knowledge of history; the enhanced process of thought and creativity; the understanding of the process of study, analysis and design of the landscape; as well as how the act of walking can generate knowledge [10; 14; 21; 22; 25; 38; 39; 41]. This paper will explore the relationships between the dynamics of the act of walking and the landscape. Initially, it will consider the history of landscape hikes alongside the changes in society, mainly since the 18th century. Subsequently, it will explore our connection to the landscape by walking, and will conclude with reflections on the growing interest in present motivations to walk in the landscape.

History of landscape hikes

The existence of paths in nature is older than the very existence of mankind itself. In search of food, animals have always travelled through the territory, leaving their marks on the ground. From the beginning, human beings walked through the landscape, defining along the way their relationship with nature. In fact, the act of walking has always been associated with the history of man (being inseparable from the history of thought) who has hiked in the landscape looking for food, making pilgrimages, marketing products, conquering land, etc. [3; 9; 37; 39]. As hunter, man hiked in nature in search of sustenance, leaving only the marks of his feet. According to the geographer Archer Butler Hulbert, many of the paths most used by Native Americans on their long-distance travels were originally made by bison. These Native Americans were traders, hunters, curious travelers or nomads [23]. As a pastoralist nomad, man became more connected with the cyclical movements of animals, particularly through the

practice of transhumance, and pathways developed in large open spaces. It can be said that the nomadic space is the path itself, and the "nomad city" is a winding line drawn by several points in movement. It is along the path that the life of the community develops, and the area which the path wends through (and the path itself) is assumed as a symbolic space [9].

In the Middle Ages and the Renaissance, trade and spiritual routes traced lines in the landscape, marking the trajectories of traders and pilgrims, many of whom hiked thousands of kilometers – either looking for new markets or seeking spirituality, making legendary journeys in the process. Trade routes seem to have existed since the first villages of Lower Mesopotamia, and, throughout the ages, many of these routes emerged in different territories, "drawing" on the ground numerous lines that led traders to their destinations [9]. Examples of such are the Silk Route and the Spice Route, both of which linked several empires, as well as major trading points, from Asia to Europe. Regarding pathways related to spirituality, it is important to mention the *Via Francigena* which was, in the Middle Ages, the largest pilgrimage route to connect Rome to the North, passing through Switzerland, France and England. Alongside Rome and Jerusalem, Santiago de Compostela is one of the main destinations of all the Christian pilgrimages, and its number of pilgrims peaked precisely during the Middle Ages. Pilgrimage is a vital part of many religions: Muslims who journey to Mecca; Hindus who cross their land to reach the banks of the Ganges [9; 22].

As time passed, the act of walking ceased to be essentially a kind of obligation, a necessity connected to everyday life. Instead it became an activity related to the enjoyment of nature. If initially it was mainly members of the clergy and the nobility who walked in the gardens and avenues, quickly this activity began to extend out to the middle classes, who were in full ascension during the 17th and 18th centuries [37]. It was during the last decades of the 18th century that the organized practice of walking tours was initiated, originally in England, especially by and for families. This interest for organized tours continued to develop throughout the 19th century, catching on across northern and central Europe [4]. The pathways, walked in an informal manner, stretched forth into the countryside, through valleys and hills [37]. It was also at this time that walking began to be enjoyed, undertaken for its own sake, and for the heady combination of new emotions and sensations one can experience when, for example, climbing a mountain. These are paths of discovery into unknown environments.

According to Braga [4], the deployment of the first landmark footpath began towards the end of the 1940s and the start of the 1950s. In Portugal, this kind of footpath began to appear in the 1980s, and its increase was seen throughout the 1990s. Today, 267 footpaths (246 small routes and 21 great routes) are currently registered and approved by the Camping and Mountaineering Federation of Portugal [8].

On the other hand, since the last decades of the 20th century, there has appeared another kind of footpath – known as Green Ways – which are paths related to the deactivated sections of railway lines. With its roots in the United States of America, this new concept grew from a movement called "Rails-to-Trails". The purpose was to constitute a strategy that promotes sustainable mobility and rural development, active tourism and healthy recreation, and contributes to the improvement of the quality of life of the population [1; 17].

Following the development and the interest seen in the Green Ways, there came the idea to connect all the countries in Europe in a similar fashion, and the European Rambler's Association was founded in 1969, concerned with the marking of European long-distance paths across Europe (E-Paths). In the 21st century, European countries are now linked by 12 footpaths that cross Europe from north to south and east to west [16], in addition to numerous national, regional and local footpath routes.

Connecting to the landscape by walking

"It is not enough to read many descriptions about nature to be able to take advantage of its influence; the descriptions are not the same thing as itself, (…)" [37, *81*].

Through hiking between points and areas, the walker appreciates and identifies the cultures and societies which he moves through, as well as the different landscapes which, with their wisdom, these cultures and societies have built.

The sequence of images that are being visualized allows the walker to anticipate the elements that identify themselves with: the evolution of humanity and society, the ecosystems, the landscape structures, and the stories they all tell, i.e., the landscape is strongly determined by the observer, through experience, perceptions and representation [19; 9; 24; 28]. The paths are areas marked by time and by society. While imagistic and symbolic of a society, the paths condense a whole imaginary universe, composed of speeches, memories and emotions, that cross, develop and symbolically structure an area. They appear as strategic places of observation and experience, where dialogues are "produced", many of which surprise us with their spontaneity. They lead man through the landscape and appear as an interaction between him and nature. They are understood as a way of reading the landscape, by offering closer contact with the surrounding environment and by allowing a multiplicity of points

of view to be found, in accordance with the knowledge and experience of the walker and observer [9; 29]. There is a clear relationship between pathways and landscape, in which the paths are an integral part of the same and allow its reading. "Walking the landscape is more than an alternative to intellectual knowledge: it is essential to knowing" [38, p.10].

The paths appear as a privileged place for an exchange of flows of disciplinary knowledge and constitute places of reference and learning.

"Experiencing the landscape involves movement. And there is no better way to experience landscape than by walking, which not only involves visual experience, but rhythm, kinesthesia, balance, and so forth" [45, p.96]. The perception that the user has of the landscape is also determined by how the paths themselves allow their viewing.

In this context, the landscape can present itself in different forms, depending on the observer. Pursuing this line of thought, it is interesting to refer to the interpretation of landscape made by a group of experts who crossed continental Portugal through "Two Lines" [13], initially imagined, and implemented in the territory along the lines of existing communications - one line which follows the coast and another which runs along the border of Portugal with the Spanish territory. Composed of lines and points, this journey was made from an interpretation of the complexity and diversity of the dynamics of the Portuguese landscape, of the contrasts and similarities, and the objective was to know and feel the territory at a rhythm provided by latitudes of every ten kilometers in both lines [12]. With its starting points at Vila Nova de Cerveira on one side and Montesinho on the other, a mesh of points was formed that functioned as stopping places and registration-spots of the landscape, where the most representative images were gathered of this place, through a sensory diary which constituted the memory of the journey [13].

To speak of the landscape is to speak of a dynamic reality, of a process of transformations and interactions between different communities that share the same territory, as well as the speed at which they occur, so that, therefore, for its reading, it should integrate the different periods of time. As Nunes [29] tells us, regarding the interpretation of the landscape through these two paths (the “Two Lines"), it was possible to clearly understand the different speeds that occurred in the territory observed, as well as their relationship with the different ages signified by the landscapes. The contrast becomes evident when you roam through these "Two Lines": between a territory such as the coast, where the mechanisms of interaction between the communities and the environment are not only faster, but also denser; and a territory such as the interior, where these same mechanisms are processed at a much slower speed. The transformation of society is reflected as well in the landscape changes and, with it, in the contrasts between regions. For Nunes [29], and because the interpretation of the landscape relates to time and speed, the records will have to be made at various times, measuring the convergence and divergence of the processes in time, and calling for the establishment of an Observatory of the Landscape. To do this, the interpretation of the landscape could be made through imaginary lines that overlap the territory, lines which are little more than paths in the landscape, enabling its reading and interpretation, which will lead to the construction of a heritage that beams a better knowledge at the present and into the future, as well as allowing us to organize an archive of cultural and artistic dimensions [29]. Alves [2] also speaks of speeds, referring to the relationship of speed and the disconnection of the traveler with the space travelled (a characteristic of post-modern man), in which the speed imposed by technological development does not allow us the time to stop, think and ponder the true impact that it has on our relationship with people, things and the landscape. Likewise, it raises the following question: "To what extent does speed disconnect at the same time that it seeks to connect?" [2, *19*]. The quick to very quick routes, made possible through the network of infrastructures built in recent decades, and present in the current road-plan, cross the territory in an indifferent manner to the area travelled and, sometimes, present a certain violence, a result of the speed with which they cross places, areas and landscapes. This violence is, to a certain extent, accepted as progress, but, as Alves [2] states, it sterilizes the life of the village. "The violence of speed - a slow hand caresses, a quick hand is a punch" [2, *22*]. However, this speed is not the one that best suits the ability to feel and enjoy the scenery.

For this purpose, the best way to connect with the landscape is walking. As stated by Schultz: "Walkers make use of all their senses, are involved with the whole body, and are sometimes exposed to exhaustion. The rhythm that characterizes the act of walking enables a complex of body and mind" [38, *7*]. The act of walking is associated with an art in which, as in dance, the pleasure is not in body movement, but rather in the sensations of the soul that are associated with it [37], and, to this end, the role of nature is fundamental. It provides matter for the walker when hiking in full nature, where man feels more human.

In fact, to know any landscape, one has to travel it on foot and feel it, and this is the most natural way to do so. When we walk, we are exclusively dependent on ourselves and completely freed to observe and appreciate the landscape as best suits us and with a complete tranquility [37; 30].

The art of walking refers not only to physical exercise, as is generally understood. Frequent walks in the midst of nature are an opportunity for that nature to have a beneficial influence on man, to allow

a deeper knowledge of the natural world, as well as to detect and observe the specificities of each landscape. Each one has its own character, a character that can only be unveiled through the insights triggered by each observer as he walks [43].

According to Schelle [37], the paths in the mountains inspire and nourish the mind. With tours through mountains and valleys, the spirit strengthens itself via the alternation between these morphological features, engendering different sensations and insights that contribute to the imagination. The diversity and the alternation contribute in a very positive way to the pleasure of walking. Walking along a path that rises up a mountain enables the unveiling of a landscape to the extent that, calmly, as one climbs up, pausing here and there, the slow unveiling of the landscape can create a special pleasure for the spirit. Petrarch's ascent of Mount Ventoux (1335) and Thomas Burnet's trips through the Alps are routes which are associated with cultural values – namely, the appreciation of nature and the origin of the aesthetic. As with ascents, descents also reveal the panorama in a particular aspect, and this panorama is always variable [37]. Such sensations and perceptions are only obtained when you walk. The speed of movement allows this unveiling little by little as you progress. To walk in a valley conveys different sensations depending on the configuration of the valley itself.

To hike in the landscape is also to be in contact with the fields, meadows and forests, and the reading of these landscapes is better achieved when we are close to them, in the midst of them, as opposed to when we see them from a distance. The fields, thanks to their variety and diversity throughout the year, almost always delight us, offering a rich palette of insights - whether a recently plowed field, whether a green field in the spring. A walk in a meadow or plain allows you to free your thoughts, in much the same way as a walk in some forests can convey an impression of romantic nature [37].

According to Thoreau [43], in walks through nature, there is a freedom of spirit that cannot be achieved in more artificialized places. The climate itself influences man, and, as is stated by Thoreau [43, *42-43*], "(…) as I believe that there is something in the air of the mountain that inspires and nourishes the spirit. Will man not achieve greater intellectual and physical perfection under these influences? (…) I believe that we will be more imaginative, that our thoughts will be clearer, fresh and ethereal, as our heaven - that our understanding will be more comprehensive and wide, as our plains - I believe that our intellect will generally have wider proportions, as the thunder and lightning, our rivers, our mountains and forests, and that our hearts will resemble in length, depth and grandeur our continental seas".

It is from the woods, forests and wild nature that many poets and philosophers are 'born'. Hiking in nature inspires all kinds of artists, as their thoughts become nourished away from the multiplicity of movements and noises, often aggressive, which characterize the most artificialized spaces. The "wild thought" is, according to Thoreau [43, *56*], the most beautiful "(…) that, among the dew which falls, rises higher over the wetlands (…)".

To hike in the landscape is also a form of art, an aesthetic experience which was manifested during the 20th century, although in different ways between the beginning and the end of the century. In the earlier decades, the act of walking was experienced as a form of anti-art, such as the wanderings of the Dadaist, which subsequently allowed artists to undertake their actions in real space [9]. It is this literary-artistic movement, led by writers and poets such as Hans Arp (1886-1966), Hugo Ball (1886-1927) and Tristan Tzarao (1896- 1963), that involves the representation of movement in the construction of an aesthetic action in real space, which is achieved through, for example, the act of walking [9].

In this primarily European experience, hiking in the landscape was related to ways of seeing and acting in reaction to the social, political and artistic paradigms of the time. Its character was fundamentally revolutionary.

By the 1920s, wanderings in a non-urban space had begun, in particular in open fields in the center of France. The routes were chosen at random and hiked by people who walked and talked simultaneously [9]. These were paths through non-urban landscapes whose space appeared as an active subject.

The relationship between the act of hiking in the landscape and artistic expression was, by the 1960s, assumed in America through Land Art. The walk was understood as an aesthetic practice, a physical modifier of space, and an instrument of knowledge of the landscape. In fact, the practice of walking often transforms itself into an art form, and a large number of artists, mostly sculptors, adhere to this form of artistic expression. As wanderings emerged as artistic forms, they also became linked to the literary field, most notably via André Breton (1896-1966) and Guy Débord (1931-1994). In Land Art, artists adopt this expression of art, through the act of walking, as a deep aesthetic experience, anchored to the visual arts (Rey, 2010). As explained by Richard Long (1945 -), comparing his work to Carl Andre (1935 -), his art is the very act of walking, hiking in the landscape, while the works of Carl Andre are sculptures on which it is possible to walk [9]. To hike in the landscape assumes different artistic expressions, either as the basis or origin of a work of art (an example of which is the work of Richard Long), or as a way to feel and see the artistic work (which can be achieved by walking on the works of art

of Carl Andre). "A line made by walking" by Richard Long is no more than a line drawn on the ground, a result of the act of walking, leaving only the marks of his feet "sculptured" in the grass, which will disappear when the same grows. This work joins the art of sculpting (line) with the art of walking (the action), resulting in a unique work of art, whose formal simplicity and absolute radicalism is considered a masterpiece of contemporary artwork [34].

Another artistic approach related to the art of walking are the journeys made by Robert Smithson (1938-1973) who, in 1967, finished *A Tour of Monuments of Passaic*, the first trip through the empty areas of the urban peripheries, which allowed not only a different interpretation of the landscape, but also an understanding of its transformations [9].

The inspiration of, among others, thinkers, philosophers, writers and musicians, is strongly conditioned by the act of walking the landscape. Writing about the French writer Charles Péguy (1873-1914), Steiner states: "The phrases marching inexorably forward, their conclusions are hammered on target by the beat of those heavy walking shoes and boots of infantry soldiers symbolic of the vision of Péguy" [40, *30-31*]. Similarly, the poet Samuel Coleridge (1772-1834) routinely walked thirty to forty kilometers per day through mountains and difficult terrains at the same time as he composed poetry. These were journeys of inspiration and creativity.

The act of walking and hiking in the landscape thus assumes different forms and different approaches, and it is indisputable that the inter-relationship established between man and the landscape he is hiking through is only possible through walking. This unique form of movement conveys a wealth of information about our identity, condition and destiny.

As Careri [9] states, the intrinsic characteristics of reading and simultaneous recording of space and landscape can lead to the act of walking transforming itself into an instrument, one which intervenes and generates interactions in the transformations of spaces and the landscape. Schultz [38] corroborates the idea that the simple act of walking generates knowledge and ideas. "(…) walking stimulates this process of perceiving, intuiting, and reflecting and, thus, is the best way to explore the area (…), and to generate ideas for large-scale landscapes" [38, *7*].

A growing interest: present motivations to walk in the landscape

"I think that I cannot preserve my health and spirits, unless I spend four hours a day at least - and it is commonly more than that - sauntering through the woods and over the hills and fields, absolutely free from all worldly engagements." [42, *3*].

The philosopher and writer Henry Thoreau, in his lecture given on 23 April 1851, foresaw the danger of a materialistic society as a consequence of the industrial revolution, as well as the destruction of the relationship between human beings and nature. The foresight of this collapse, accompanied by the expulsion of spirituality that natural spaces afford, was pinpointed by Thoreau, bringing attention to the fact that man becoming overly attached to civilization would lead to the loss of vital capacities, the degradation of vital instincts and the subsequent decline of civilization.

Effectively, the progressive changes and transformations that have been taking place in the landscape (particularly since the industrial revolution) and the ensuing pressures which have been placed on it have led to the misappropriation of resources, to the degradation of its spatial framework as a consequence of its exploitation, as well as to the deterioration of its visual quality.

Roads, motorways and railways have allowed a greater rapidity of flows, of movements of people between areas. Life is characterized by an increasingly accelerated pace – a pace which is clearly inappropriate when we take as reference the rhythms of nature (of which man is an integral part, though he seems to want to forget this).

On the one hand, walking begins to not make sense, because the walker's own pace is inconsistent with the pace that technological evolution seeks to impose. The speed with which travel occurs leads to a growing separation between the environment and man, as the necessary time to "feel", observe and think about the space and the landscape is not compatible with the speed at which man moves, or, at least, it is so in a very different way. The paths and roads have become almost fully occupied by motorized vehicles, and, in urban areas, the cross-sectional profiles of the streets have widened, with the consequent reduction (or, in some cases, absence) of space for pedestrians. This new reality of space allocated to the modern road-plan both in rural and urban environments discourages walking since, in addition to the need that man feels to move at an increasingly rapid pace, situations of conflict between the pedestrian and the car are beginning to make themselves felt in an increasingly pronounced manner. In this context, Caldeira Cabra galerts us to the need "(…) of the construction of footpaths to walk beside the main roads, which is already well established in many countries and is of great advantage to everyone, given the increasing speed of traffic" [7, *141*].

After long decades of progressive growth, the increase of urban areas accentuates the separation between the city and the countryside, and the reduction of the presence of nature in urban spaces. The connection to the “earth” slowly and gradually disappears [6]. In fact, the 20th century was marked by a boom in the growth of urbanization, at a global level, in which a quarter of this growth occurred

between 1950 and 1980 [27]. The cities were no longer "points" in the landscape, but encompassed wide areas and gave rise to a large concentration of people: communities who were and remain subject to an artificial life, one in which the use of material wealth quickly becomes confused with happiness or quality of life. As the quality of life in cities decreases, the urban society begins to suffer from living in an inhospitable environment where the presence of nature is not felt. This megalomaniac increase of the concentration of people in urban areas - the new Metropolis – has led to the abandonment of fields, and to the depopulation and desertification of rural areas [31], causing the destruction of natural areas and/or rural areas close to the cities. All of this has resulted in an increasing environmental imbalance in the industrialized world, and the need for the presence of nature and a diversified, humanized, balanced and biologically active landscape.

Environmental consequences, which have been intensifying on a par with technological growth, gave rise to the environmental movements that developed primarily from the 1960s onwards, as well as increased interest in issues related to sustainable development and the preservation of the quality of the environment. At the level of the landscape and the environment, the concept of protection of nature was born. Thus, the first National Park appeared (Yellowstone National Park in the United States of America, nominated later, in 1976, as a biosphere reserve and, in 1978, classified as a World Heritage Site by UNESCO). This was the first milestone in the beginning of the development of an effective policy of protection of nature, whose philosophy was linked to aesthetic values. Following the creation of this park, several Natural Parks began to emerge in Europe whose philosophy exceeded simple aesthetic interests. A markedly ecological philosophy was assumed, with a view to the protection of certain species of plants and animals. This philosophy continued to evolve, assuming a fundamental role in the characterization and protection of ecological processes.

If the creation of National and Natural Parks was an important milestone in matters related to the protection and conservation of nature, at a later stage environmental organizations played a fundamental role in the continuity and, especially, in the consolidation of these policies of protection and conservation of nature. In this context, after the Second World War, the United Nations Educational, Scientific and Cultural Organization (UNESCO) was created, and in the follow-up of this policy, throughout the years several organizations emerged as well as diverse documentation. This occurred not just at an international level, but also at a national level: in the creation of the Network of Biosphere Reserves (1971); in the establishment of the United Nations Environment Program (UNEP, 1972); in the Declaration of the Environment, drawn up at the United Nations Conference in Stockholm (1972); in the World Conservation Strategy (1980); in the Brundtland Report (late 1980s); in the Earth Summit held in Rio de Janeiro (1992); in the Lisbon Action Plan (the second European conference on sustainable cities) and its approval of "The Letter to Action" (1996); in The Kyoto Protocol (1997); in the Johannesburg Summit (2002).

However, those policies, related to the issues of nature conservation and protection, had quite a sectorial approach, one which did not focus on the landscape. It was at the end of the 20th century that the preparation of various documents also aimed at the landscape began: the Letter of Mediterranean Landscapes, in Seville, also known as the Letter of Seville (1994); the publication of the Strategy for the Conservation of Biological Diversity and the Landscapes (PEBLDS - Pan-European Biological and Landscape Diversity Strategy, 1995); and the European Landscape Convention (2000). In this perspective, the various currents of thought showed not only the concerns in relation to existing problems (such as disproportionate and megalomaniac growth without taking into consideration balance and ecological and landscape values), but also the ideologies that are related to them.

However, if, on the one hand, efforts were made to minimize the negative impacts that technological growth caused, on the other hand, society tried to find the biological and environmental balance that it was losing with these technological advances. In the late 20th century, we see the growing demand of rural areas, for they were the areas which most closely resembled natural space, both in terms of enjoyment and habitability [25]. This demand, mainly propounded by urban dwellers, gave rise to a diverse set of actions, declarations and resolutions, which held the aim of meeting the demands of the people (in particular as regards to outdoor activities) and providing more sustainable development in landscapes of quality – a key element of individual and social well-being, as understood in the physical, psychological and intellectual sense.

Following the concept of the Green Way in the USA in the 1960s, from the 1990s onwards there has been an expansion of Green Ways throughout Europe [11] – the European Green Ways Association (EGWA) was created, adopting the resolution of Logroño (1998). These Green Ways are paths through nature, identifying themselves as lines in the landscape, increasingly sought after by urban dwellers. In Europe, in the 1960s, the European Rambler's Association (ERA) was founded, and by 1971 it already included 14 organizations from six European countries. Currently, the ERA includes more than 55 organizations from 30 European countries and has more than three million individual members [16].

These numbers show us the strong adherence of people to this type of activity from the end of the 20th century, as well as the public demand for more naturalized areas for the practice of outdoor activities, specifically walking.

Initially, before the end of the 20th century, the European Rambler's Association was mainly concerned with the marking of 11 European long-distance paths across Europe (E-Paths) [15]. From a conference held in Strasbourg, the Declaration of Strasbourg (28 September 2001) was adopted, its main objectives: to draw, mark and maintain 11 European long-distance paths across Europe; to understand and protect the countryside in accordance with the principles of sustainable development; to know the history and culture of Europe, as well as promote the protection of heritage; to preserve the right of free access to the countryside while respecting the environment [15]. Its objectives were therefore equally oriented toward the European Union, the understanding between peoples, the preservation of nature and of the European cultural heritage, integrated in a sustainable development and contributing to the improvement of the quality of life of the people.

In some regions of Europe, the practice of marking footpaths has a history of more than 130 years [5]. The practice of walking is a difficult activity to calculate, in terms of the number of people that practice it, so there is no exact knowledge of the evolution of the number of practitioners throughout the ages. According to the records of practitioners in the national federations, the number of groups and associations organizing hiking, and also the number of activities related to walking, it is known that it is an activity in real progress. In France, in accordance to the Ministry of Health and Sports, the number of walkers reached five million in 2010 [44].

Among outdoor activities, and those related to nature tourism, walking has been highlighted as an activity in growth. In rural areas there has been an increased interest in new tourist products, including recreational activities. One of these activities is hiking, a factor which contributes to the progress of Rural Tourism [25].

The significant increase in adherence to outdoor activities, especially walking [18], which has been observed in recent decades, is an indication that people are looking for new ways of being in contact with nature.

It was at the end of the 20th century and the beginning of the 21st that a big boom in the implementation of pedestrian paths at the Portuguese national level occurred [35]. According to the Federation of Camping and Mountaineering of Portugal, at the beginning of the 21st century there was an increase of approximately 40 % of paths. The interest in this type of activity (hiking in nature), both in organized groups and individually, has been increasingly gaining supporters, which reflects the increasing demand, by man, for naturalized areas. The restorative effect of nature on man is, indeed, one of the fundamental aspects of this increased demand, mainly from the urban area. According to Grant et al [21], there are several studies which demonstrate that there are many benefits to our health associated with walking. Short regular walks can generate both mental and physical benefits, mainly if people walk in green spaces [21]. Outdoor recreation and, particularly, walking in the countryside, may be especially beneficial in promoting the general health of people [21; 36; 46]. Nowadays people walk for different reasons: to reduce stress levels; to escape from their daily lives and daily routines; to walk for pleasure and shared experiences; to provide the opportunity to socialize; to exercise; and to learn landscapes (to only mention but a few) [21; 26; 46].

The demand of nature, as a way of escaping everyday life, is effectively the "return" to nature.

Conclusions

This reflection intends to discuss the relationship between hiking and the landscape throughout history, and to emphasize the importance of the act of walking, not only to feel and better understand landscapes, but also to highlight the importance of establishing a deep linkage with landscape for man’s quality of life. Throughout history there have been different ways that man has connected to landscapes through walking: as a need (for shelter, for food, for spirituality); as an artistic manifestation; as a form of discovery, of investigation; to convey knowledge; [3; 9; 22; 37; 39].

The progressive increase of urbanization causes a decrease in natural and rural areas, and man has become more and more disconnected from nature [6; 27; 31].

In consequence, people, mainly urban people, are looking for new ways of being in contact with green areas, especially natural ones. During the last decades, we have seen an increase in the demand for outdoor activities [26; 35; 44]. Several studies prove that the contact, by hiking, with natural and / or green areas (especially walking in the countryside), is good for health – there are physical and mental health benefits, and nowadays people hike for many reasons [21; 36; 46].

However, it seems that more benefits are derived from hiking in natural environments rather than urban environments [6]. According to literature, since the 18th century philosophers, thinkers and scientists have defended the importance of hiking in the natural landscape to develop their thoughts and their creativity [37; 43]. So, hiking in the natural landscape assumes a great importance in the maintenance of a healthy body and, mainly, a healthy mind – one which can and

probably will contribute both to the development of the sciences and to the development of society.

It is important that we develop future research to improve our knowledge not only about the influence of walking in the natural landscape, related especially to the benefits it has on man's creativity, but also to improve the knowledge about how to combine modern life with the benefits of walking in nature. Also of increasing importance is the need to develop research about urban planning designs associated with walking in nature, including natural and green areas. Emphasis should be given to the inclusion of green and blue infrastructures in urban planning, ones which will allow human beings during their daily lives greater contact with natural spaces.

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Kopsavilkums. Jau no seniem laikiem cilvēks ir veicis pārgājienus ainavā, izveidojot savstarpēju savienojumu starp diviem vai vairākiem punktiem. Pārgājieni pa takām ir cilvēka aizbēgšanas līdzeklis, kas izraisa pārmaiņas ainavā un izplata jaunas vietas. Rakstā ir atspoguļota dinamika, kas izveidojusies starp cilvēku un ainavu, kā arī sabiedrības pārmaiņas (pārsvarā kopš 18. gadsimta). Dabas taku pastāvēšana ir vecāka par pašas cilvēces eksistenci. Konkrētā darbība vienmēr ir bijusi saistīta ar cilvēka vēsturi ainavā, kas meklēja pārtiku, veica svētceļojumus, tūrismu, veselīgu atpūtu un iedzīvotāju dzīves kvalitātes uzlabošanos. Kad mēs staigājam, mēs esam tikai atkarīgi no sevis un pilnīgi brīvi spējam novērot un novērtēt ainavu, kas vislabāk atbilst mums, iegūstot mieru. Pārvietošanās, pastaigas ainavā ir labākais veids, kā uztvert un veidot ciešas attiecības ar ainavu. Mūsdienās ievērojami palielinās aktivitātes ārtelpā, īpaši pastaigas. Cilvēki meklē jaunus veidus, kā sazināties ar dabu. Dabas atjaunojošais efekts uz cilvēku patiešām ir viens no šī pieaugošā pieprasījuma pamatā esošajiem aspektiem un cilvēki staigā dažādu iemeslu dēļ. Nepieciešams veikt arī turpmākus pētījumus par cilvēku pastaigu sasaisti ar ainavu un ieguvumiem, ko sniedz pastaigas dabā.

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Building Contraventions in Tehran and Its Control by the Municipality

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Abstract. Most problems of Tehran metropolitan areas are associated with building contraventions. This paper, using descriptive-analytical method, is study of building contraventions in Tehran, Iran and its potential reasons. Discussed factors in non-compliance with building regulations and their quality in Tehran city. Also I argue how Tehran municipality has managed the contraventions of building violations. Given a review of conducted policies and activities related to building control, I concluded that wrong implementation of urban planning in Iran which is contrary to building standards and detailed plans, mostly is related to the contravention of building regulations in terms of floor area rate or stories which has caused Tehran to face with greater vulnerability to natural events. Also I found out that the economic factor is the most important reason for building violations in Tehran.

Keywords: Building contravention; Municipality; Tehran metropolis; violation

Introduction

Urban management has attracted considerable institutional attention at the international level. There are some different definitions for urban management; its concept "lacks coherence, and the implications of its use are vague and contradictory" [1]. Davidson and Nientied [2] defined it as "taking an active role in developing, managing and coordinating resources to achieve a town's urban development objectives". According to Mattingly [3], it is the implementation of public administration with a specific character such as greater involvement of the private sector or taking an active role rather than just a passive role in achieving town development. Its term is combination of qualities such as physical (town) planning, project management, public administration, and business organization management. MacGill [4] stated that urban management has two objectives: "first, to plan for, provide and maintain a city's infrastructure and services, and second, to make sure that the city's government is in a fit state, organizationally and financially, to ensure that provision and maintenance". From another perspective, the urban management can be considered along with a regulated and sustainable development. In Iran, its definition has been limited to the administration of cities mainly due to the variety of structural, organizational, technical and budgetary problems. Because of these constraints, the problems in Iranian cities not only have remained unsolved, but also have wasted their existing potentials.

For development of cities and rehabilitation of urban settlements, urban management is very important and has a decisive role in developing countries like Iran. On the other hand, the informal urban districts are a huge challenge against planned and managed urban development [5]. Urban development plans include responsibility of groups and organizations, financing method, operational projects and urban construction rules and regulations are the only applicable dimensions of urban development plans [6]. The expansion of urban areas and the need for housing and development with a variety of technologies have influenced living conditions of people and have caused many of cities to face with a crisis. The increase in the number of cars, increase in the price of land and housing, the need for public services, urban health issues, the need to carry out a variety of development activities such as expansion of green space, creating or leveling asphalt pavements, public facilities, and infrastructures all require qualities in appropriate program, extensive use of specialists, meeting the needs of a city, having sufficient funds, and efficiency of urban management. Success and implementation of urban development plans is related to the quality of presenting and performing urban development rules and regulations. Urban planning and preparation of development plans in Iran is centralized, governmental, bureaucratic, and in some way affected by the rentier system. Accordingly, formal and non-formal institutions of public and private sectors, directly and indirectly have most important role and impact on the process of urban development planning.

The majority of problems in Tehran metropolitan areas are related to building contraventions, which was increased after migration from other parts of the country to the area. This migration coincided with a boom in the construction sector and an increase in density selling by the Tehran municipality due to its inefficient and inappropriate building controls. Applying non-scientific approaches in determining the density of buildings, and lack of suitability of these offers with the characteristics of residential parts, can be one of reasons that have reduced the quality of living in cities of Iran. Studies in the field of building density [7-10] reflect the impact of several factors on its determination including wintry light, open space per unit, number of residential units per area, spatial closeness, and area of building

components all of which are important to avoid building contraventions.

There are a few national studies on assessing unauthorized urban management and building contraventions. Hadizadeh [11] stated that, in Iran, "outskirt-sitting and informal housing is rooted in structural social changes, the emergence of economic crises and accelerated migration of villagers to the cities". Rafiyan et al. [12] in their case study concluded that the sustainable development in Sabzevar city can be achieved if, firstly, residents carry out a variety of joint projects. secondly, the current urban management must change their former traditional views. Another case study analyzed the socioeconomic, spatial, skeletal, and functional effects of the illegal neighborhoods in the Chabahar city and explored the reasons that have resulted in the unauthorized urban neighborhoods in the city [13]. In one related study conducted by Sarkheyli et al. [14] to identify the reasons and origins of building contraventions in Tehran, it was revealed that developers' level of awareness is the most influential factor leading to non-compliance with floor area ratio (FAR) requirements, and housing-related motives had the greatest influence on this non-compliance. Almost no study was found that have recently assessed the building contraventions in Tehran and the Tehran municipality activities for its control. In one recent national study found in literature, Salari and Safavi Sohi [6] analyzed the status and reasons of constructional violations in Tehran. They also presented the consequences of violations which have led to the failure of urban development plans. Considering this limitation and the importance of building contraventions, in this study, using descriptive-analytical method, I attempted to analyze building regulation contraventions in Tehran and its management by Tehran municipality. First I reviewed the history of urban development rules in Iran. In next section, materials about building regulations contraventions are provided, and then, Section 3 reviews policies of building control by Tehran municipality. Finally in Section 4 conclusions and recommendations are presented.

Tehran

Tehran is the capital of Iran. With a population of around 8.4 million in the city and 15 million in the larger metropolitan area of Greater Tehran, Tehran is the most populous city in Iran and Western Asia, and has the second-largest metropolitan area in the Middle East. Tehran was first chosen as the capital of Iran by Agha Mohammad Khan of the Qajar dynasty in 1796, in order to remain within close reach of Iran's territories in the Caucasus, before being separated from Iran as a result of the Russo-Iranian Wars, and to

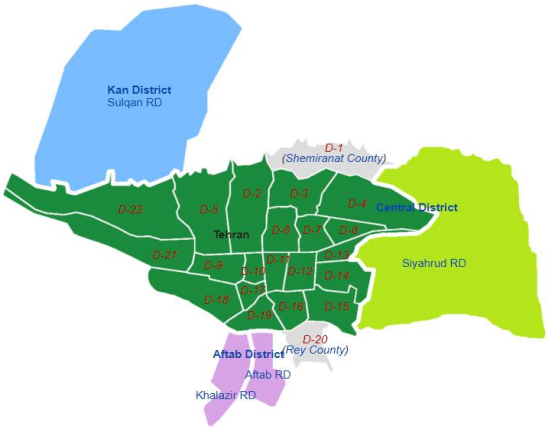

Fig. 1. Tehran's municipal divisions
[from author private archive]

avoid the vying factions of the previously ruling Iranian dynasties. Large scale demolition and rebuilding began in the 1920s, and Tehran has been a destination for mass migrations from all over Iran since the 20th century. The metropolis of Tehran is divided into 22 municipal districts, each with its own administrative center (Fig. 1). Twenty of these districts are located in Tehran County's Central District, while the districts 1 and 20 are respectively located in the counties of Shemiranat and Ray. Northern Tehran is the wealthiest part of the city consisting of various regions.

History of urban development rules in Iran

There are three periods that can be considered as significant turning-points in the history of urbanization in Iran including two revolutions, one in 1907 that changed the type of government to Constitutional Monarchy, and the other in 1979 which led to the establishment of the Islamic Republic of Iran. The third period is related to World War II between these two revolutions. The growth and expansion of Iranian cities in the first period had almost the same characteristics as most other cities of the world and development was mainly affected by political and/or natural events. After establishment of first National Parliament (*Majlis*) in 1906, the first law of urban development was passed called "*Baladiyeh*" (municipal law) in 1907 providing a detailed outline on issues such as the role of councils within the city, the members' qualifications, the election process, and the requirements to be entitled to vote, and then two laws of *Anjoman-haye Eyalati* (state association), and *Anjoman-haye Eyalati-va-Velayati* (state/province association). After the 1907 Revolution which led to the establishment of the Pahlavi' dynasty in 1925, new legislation was passed in order to remove the legal difficulties. For example, the Municipal Law was modified in 1930. Until 1930, no other serious attempts were made for the management and control of cities. In 1937, *Anjoman-haye Eyalati-va-Velayati* law was changed and replaced with Administrative

Division Law according to which Iran was subdivided into provinces (*Ostan*), counties (*Shahrestan*), districts (*Bakhsh*), and rural districts (*Dehestan*). According to this law, municipalities were as government offices under the supervision of governor. Attempts were made by the government to rehabilitate urban centers and, in particular, improve streets and urban routes. The law of construction and improvement of routes and streets was the first legal instrument in the field of municipal activity. These activities came to a halt in 1940 because of World War III. During this period, external forces created by the world economy caused fragmentation and inconsistency in the growth of the socio-economic, spatial and political aspects of the country. There was a tendency towards modeling after Western countries blindly, without examining the suitability of those models to the country's social and physical structure, and cultural heritage. In the new town rehabilitation movement (1930-40), the old community centers turned into unstructured dispersed patterns of development. Streets which were constructed on the basis of Western cities destroyed the old boundaries of the existing districts [15, 16]. After World War II, the planning system was established in Iran and government decided to prepare socio-economic development plans, but increased oil revenue continued to facilitate dependent urbanization.

From 1944 to 1978, in addition to the gradual modification of the laws relating to municipalities and city councils, new formal institutions and elements were entered into the urban management cycle based on the government decisions including Management and Planning Organization, Ministry of Housing and Urban Development, the League of Municipalities, and technical offices. Table 1 summaries the development plans conceived before 1979 Revolution. Mashayekhi [17] in a study has shown how the geopolitical context of the Cold War, and the political agendas of multilateral and bilateral development agencies (i.e. the World Bank and the Ford Foundation), together with the specific circumstances of the national modernization of Iran, were decisive in shaping the Iranian planning administration and the emergence of a comprehensive master planning approach from 1945 until the 1979 Islamic Revolution. After the 1979 Revolution, no efforts were made to make a new plan until 1982 due to the war with Iraq, which commenced in 1980. In 1982, government decided to prepare a new development plan but it was not approved by the National Parliament. Until the war with Iraq which was terminated in 1988, socio-economic and cultural developments were postponed due to the freezing of the country's foreign assets, a volatile international oil market, and economic sanctions. In 1988, the first Development Plan after revolution was approved which lasted five years aimed at developing infrastructure, curtailing inflation, removing a number of nontariff trade barriers, lowering income tax rates, privatizing public enterprises, reconstruction of the war zones, liberalizing the exchange system, pursuing an equal distribution of income, creating employment for the youth., etc. The second 5-year Development Plan (1994-1999) followed the policies of the first plan. In this period, the economy continued to grow at a very slow pace despite a significant rise in oil prices during the first three years of the plan. The second plan failed in the elimination of subsidies, the privatization of state-owned enterprises, and the exchange rate unification policy. It increased Iran's foreign debt. The third and final 5-year Development Plan (2000-2005) aimed at: 1) greater transparency in the macroeconomic system and regulatory frameworks; 2) budget reforms; 3) tax reforms; 4) downsizing of the government's role in economic activities and privatization of government enterprises; 5) Promotion of the private sector; 6) dismantling of monopolies and promoting of competition and; 7) establishment of a comprehensive social safety net to protect the most vulnerable groups [18]. The rapid pace of urbanization in Iran has led to new demands for jobs, housing, urban space and goods and services, the structural adjustment to the urban economy did not increase the productive capacities of the country which resulted in dependent urbanization and unbalanced growth [16].

Building regulations contraventions

Many building owners, to expand their living space, may decide to develop their property according to changing needs and their lifestyle; for example, adding a floor, terrace, extra height, equipment and other spaces such as garages, warehouses and canopies, or even encroaching on neighbor's land. According to the rules of urban construction in most cities, building development is permitted if it observes the maximum permitted building density of construction on the land, while ensuring building strength. Failure to adhere to these principles, is one of common building violations in some cities whose effects can be observed in various dimensions (economic, social, physical and environmental) and different levels (from the neighborhood to the entire city). Building contraventions can have various forms and have a variety of effects; e.g. a small building in a suburb or a luxurious building in an elegant district [20]. According to Arimah and and Adeagbo [21], the most violated aspects of building regulations are "plot coverage, setback stipulations, room size, provision of utilities, as well

TABLE 1

Development Plans of Iran before 1979 Revolution [16]

Plans	Objectives
First 7-year Development Plan (1949 -1956)	Establishment of the Plan & Budget Organization as well as the machinery for planning.
Second Development Plan (1957-1963)	An increase domestic production for the national market as well as for export; the development of the agricultural and industrial sectors; the discovery and extraction of new mining pools and other natural resources; the improvement and completion of communication facilities; public health; and any other actions deemed necessary to improve the standard of living and the betterment of public services.
The Third Development Plan (1964-1968)	The emphasis was placed on budgetary arrangements. In this regard, the Plan & Budget Organization was brought under the control of the Prime Minister's Office. A simple econometric model was developed to co-ordinate public and private actions as well as to ensure the necessary investments
The Fourth Development Plan (1969-1973)	Economic growth and increase in Gross National Income; social equity and a more even distribution of income; speeding up the urbanization process; decreasing the dependency of the country on imports.
The Fifth Development Plan (1974-1978)	The promotion of improving the standard of living for all social groups of the country; maintaining rapid, but continuous and balanced, economic growth; increasing the income of different social groups, with special emphasis on raising the standard of living of low- income families; expanding social, economic, political and cultural equity more comprehensively with special emphasis on the even distribution of services for different social groups; improving the quality (skills) of the work force being added to the active population of the country, in order to increase output and remove some of the existing deficiencies; conserving, restoring and improving the eco- environment and raising the standard of living of communities, in general, and of populated areas in particular; developing science and technology and expanding the community's creative and innovative potential; to improve the relative quality of domestic production in order to promote export to international markets; the maximum use of the country's foreign exchange reserves to remove domestic deficiencies and cope with inflationary pressures; and to preserve and restore cultural heritage.

as a change of use from a wholly residential use to the incorporation of home-based enterprises". They identified factors as important predictors of low level of compliance with building regulations: "the institutional context of urban development and planning regulations; the administrative machinery for physical planning implementation which does not make for inter-agency coordination; poverty of the general populace; and the disdain and apathy of the public towards formal planning institutions in the city".

The typology and severity of building contraventions varies from society to society and from country to country. Many studies conducted in different developing countries [21, 22, 26-28] have shown that the contravention of building regulations is much more problematic in developing countries and occur in the parts of cities with lower quality of life, poverty and illiteracy. Informal settlements, slums, and periphery settlements have the highest rate of contraventions [29].

Building contraventions in Tehran: Factors and reasons

The cityscape of Tehran is polarized; the northern part is inhabited by affluent citizens, and the neighborhoods there have high quality of life. However, as one travels south, the quality of life declines and the neighborhoods become inhabited by low-income people (Fig. 2). These southern neighborhoods and the informal settlements around the city have higher incidences of building contravention [30]. According to statistics from Municipality Commission under Article 100 of the Municipality Act in 2012, on average, of every 100 new units, 15 units have violated the building regulations in Tehran. Sarkheyli et al. [14] in their study presented examples of building contraventions

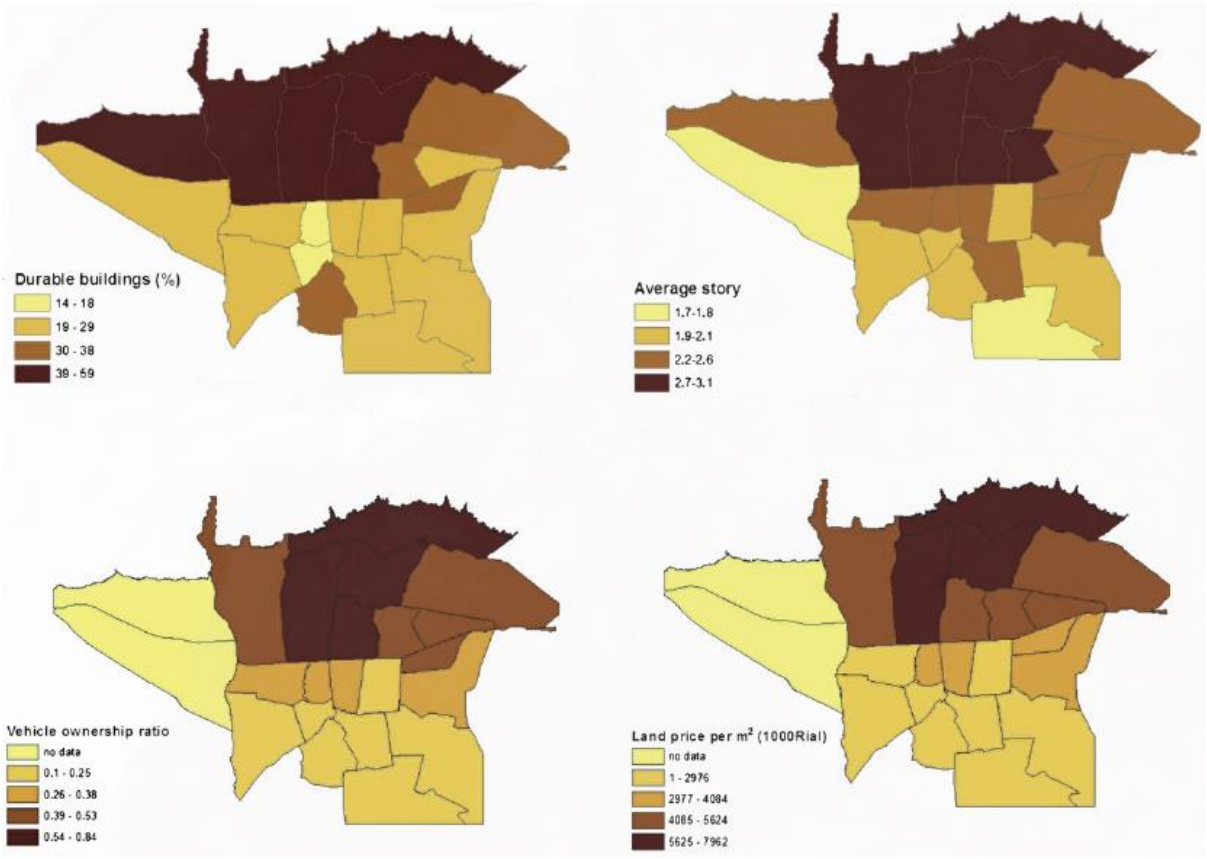

Fig. 2. Cityscape of Tehran adapted from [14]

in parts of Tehran as: "illegal ownership of land, informal subdivision, unauthorized building, construction using low-quality materials, and noncompliance with floor area ratio, setback, ventilation, lot coverage, resistance-related standards and other regulations".

Building contraventions in Tehran dates back to 1945. From then on, the most common building contraventions in Iran were: Floor area contraventions, change in land use, building without permission, violation of minimum parking requirements, and violation of national building regulations. According to article 100 of national municipal act (2001), housing needs, income requirements and lack of familiarity with construction laws and regulations are the main reasons for constructional violation in Tehran [14]. In Tehran, housing construction market has become a competitive arena for those seeking maximum profit. This often led to the reduction of construction costs at the expense of the qualitative aspects of construction. Diargah [31] reported that building contravention is one of the main causes of anomalies in Tehran's urban expansion and has caused many problems such as the uneven distribution of people and activities throughout the city; the physical disorder of urban walls, edges, and spaces, which leads to a squalid visual impression (Fig. 3).

Sarkheyli et al. [14] specified the causes and reasons for contravention of building regulations in Tehran as following: (a) Economic motives: including profitability of contravention and reducing construction costs; (b) Social motives: construction for own use; (c) Awareness level: including lack of awareness of regulations, lack of awareness of regulations' importance, and unawareness of violation; and (d) Supervision: including possibility of committing violation without the 'municipality' noticing, and protracted process of obtaining building permit. Salari and Safavi Sohi [6] argued that constructional violations in Tehran are not only the natural results of city growth and population attraction, but also the results of (a) socio-commercial conditions of Tehran, (b) weak urban management system and (c) rules and regulations which are incompatible or inappropriate with physical conditions and social and commercial requirements. In this regard, they reported wasteful migrations, residential needs, earning requirement, lack of familiarity with construction rules, people's low knowledge of planning rules and regulations, lack of appropriate financial supports for housing in addition to the increasing housing needs, having a crowded family,mistrustful of rules by people and their trivialization as the social-commercial reasons. The factors such as municipal dependency to the fines resulting from violations, lack of

Fig. 3. An example of building regulation contravention in Tehran [14]

TABLE 2

Consequences of building contravention in Tehran during four periods [6]

Period	Consequences
1970-1989	Marginal development and horizontal growth of Tehran; many violations of changing the usage in changing usages of green spaces and gardens (in detailed plan) and constructing unlicensed commercial unites in residential regions (these violations are the reasons of failing to fulfill large parts of approved green space and garden areas in the first comprehensive plan); wasteful constructions in the lands of Abbasabad and the lands in the west of the Kan river, constructions of co-operatives, constructions in Alborz hillside in the limits of 1800 meters, constructions in garrisons and governmental-military lands, constructions in gardens and villas in the form of garden towers and losing valuable historical or architecture textures and cultural heritage [32].
1989-2001	Continuing wasteful constructions until the mid-1991 and stating to consider the violations of constructing buildings without license which are related to the previous period and in this period, their existences and getting penalties were mostly accepted; the violation of having no parking (code no.10), other development rules (code no. 12), residential building with additional density (code no.2), the building contrary to the limit of permitted density (code no. 1) and changing usage (the code 6) are the major violations of this period; persuading to construct additional density and existence of constructional violations with additional density according to policies of selling density; entering large number of citizens who do not have any expertise to construction industry and constructing unstable, unsafe, without engineering methods and lack of quality buildings; high volume of violations in residential building with additional density and as a result, unpredicted increasing in population of Tehran districts including the northern districts 2, 4 and 5. Finally increasing the requests of urban facilities such as passages and infrastructures. Increasing the urban traffic which is affected by violation of residential building with additional density and changing usage; high volume of violations in changing usage in the central districts 12, 13 and 6, and southern industrial districts like 15 and 16; improvement and chamfer and plan which are not observed (code no.11) are the major violations of this period and its result is just destroying the opportunities of changing passages, making streets which is proposed in detailed and comprehensive plan of Tehran.
2002-2011	Increasing in the violations of other development rules (code no.12) and the violation of changing usage (the code 6) and also, significant increasing (nearly doubled) in the violation of changing usage in the districts 22, 7, 9 and 3. Considerable number of violations in changing usage in the districts 6 and 12 and finally intensifying the focus of non-residential activities in central districts and intensifying instability of spatial structure of Tehran; serious decreasing (more than half) in violation of constructing a building contrary to the limit of permitted density (code no.1) and significant decreasing in this violation in the districts 4, 2, 5, 15, 16, 17, 18 and 19; decreasing the violation of residential building with additional density in most of the areas and increasing it in the districts 1, 7, 8, 20 and 22 (considerable increasing in the districts 1 and 22). Consequences of large number of violations in residential building with additional density in the districts 1, 4, 19, 20 and 22 compared to other districts and previous period can be seen in increasing settled population and increasing the requests of facilities and infrastructures and increasing the requests of travelling.
2012 until now	Decreasing the violation of changing usage in central districts and increasing it in northern affluent districts of the city (the districts 2, 4, 5 and 10). Increasing the mean area of violations in changing usage, compared to previous periods. Tendencies to violations of changing coarse-grained usage and finally more consequences of increasing the requests of unpredicted travelling; increasing in the violation of non-residential building with additional density in many districts of the city. Significant increasing in non-residential building with additional density in the districts 2, 4, 7, 10, 13 and 16; constructing stored urban lands which are proposed by detailed plan before communicating the rules of detailed plan and destroying the opportunities of flexibility in responding to services and facilities needed in different districts; decreasing in violation of residential building with additional density in all districts and significant decreasing of this violation in northern and southern districts; significant decreasing in violations of having no parking (the code 10), improvement and chamfer (code no.11), other development rules (code no.12) and violation of residential building in the limit of permitted density (code no.1).

accountability by municipal officials and not reporting violations, delaying licensing process, lack of appropriate strategies for controlling violations, weakness in urban management for preventing the violations, lack of cooperation between sections to solve housing problems, and lack of coordination in providing a technical identity for buildings were considered as administrative and management reasons; and the factors of the reasons related to non-compliance with rules and regulations were listed as: inability to perform the rules or their incompatibility with the conditions of residents, uncertainty in planning standards and its extensive changes, high growth rate in some areas and lack of proper strategies for their control.

The most important consequences of building contravention in Tehran are summarized in Table 2 where four periods are considered: A) from 1970 to 1989 when regulations of first comprehensive plan of Tehran and financial self-sufficiency of municipal were performed; B) From 1989 to 2001 when density sales policy and modifying regulations of Tehran were carried out; C) From 2002 to 2011 when amendments were made to the planning regulations of Tehran; and D) From 2012 until now when the rules of third comprehensive plan were approved and carried out.

Activities and policies of building control by Tehran municipality

Figure and Urban management affects the occurrence of urban contraventions and their increase or decrease in two ways: The first is through the policies that are instated to control urban land, respond to the needs and demands of citizens for affordable housing, and to appropriately guide related investments [22, 33]. The second is through the direct control of urban construction and building contraventions. It has been reported that existing formal urban planning standards and regulations have been unable to control building contraventions [23]. Issuing demolition verdicts or requiring the removal of illegal buildings, and paying monetary fines were initial policies of Tehran municipality. In fact, these fines were as sources of revenue. By 1990, without a plan to guide construction activities in the municipality, the municipality was decided for ‘‘density selling’’, but this decision was resulted in more contravention-related problems and it became a way for citizens to gain high profits, and as an opportunity for municipality officials to increase revenues. Table 3 presents a summary of policies and actions in Tehran to manage contravention of building regulations.

TABLE 3
A summary of actions and activities related to building density management in Tehran

Activities	Year
Raising the issues of building contravention and establishing regulation enforcement guarantees	1945
Definition of the municipalities’ laws, legal liabilities and enforcement measures	1966
Approval of Tehran’s first comprehensive plan and establishment of regulations for density, usage, set back and parking in the plan	1970
Approval of building and architectural law, and providing guidelines for the control and supervision of building and construction works	1973
Expiration of first comprehensive plan, presenting density selling concept as a new source of income and as a result, independence of Tehran municipality	1989
Abolish of density selling	2002
Granting permits for greater building density through various circulars and change of demolition verdicts to monetary fines	2002-2011

Conclusion

This study attempted to analyze the incentives and reasons for the violation of building regulations related to the density in Tehran. In this regard, we discussed factors in non-compliance with building regulations and their quality. Wrong implementation of urban planning which is contrary to the building codes and detailed plans mostly is related to the contravention of building regulations in terms of floor area rate which have faced Tehran with greater vulnerability to natural events. Buildings must comply with the limitations of the approved building density. Another issue is land use control. In land segregation for new urban areas, it is mainly focused on residential subdivision without considering space requirements for schools, parks, mosques, roads, public parking, shopping centers, pedestrian paths, open and green spaces; and in design of buildings and determining building density, landscape has small role. Most towns have remained single and centered. Economic and budget problems is such that municipality prepares the budget for required costs by density selling, issuing fines for many building violations, issuing permits for any construction even noisy ones, and disturbing the peace of residents in

neighborhoods. In most towns with detailed and comprehensive plan, there is an attempt to change the land use which is because of the lack of experienced specialists in urban planning decisions, increased density and floor area, destruction of urban green spaces, and creating a land-use plan without paying attention to the width and area of roads and the capacity of the space available for them. In general, economic issues have received more attention rather than social issues. This has affected even the conditions of traditional urban textures. Social life is turning into personal life. Houses are destroyed due with the permission of the municipality to be converted into multi-storey buildings for sale. It is suggested that Tehran municipality should expand social sectors and consider their great role in urban management programs. In this respect all municipal and urban management programs should be based on mental and social studies and behavioral patterns of residents and their improvement.

Given the association between the knowledge of infringement related to building density and the large number of violations in this regard indicates that the majority of builders and officials have insufficient knowledge of construction rules and standards. Unfortunately, construction activities in Tehran are largely carried out by non-specialist groups for whom financial benefits are more important than quality and safety of the buildings. So, employing specialists and experienced groups for constructions in Tehran is a need and it should not be done by non-specialist ones. A large number of people have motivations to violate the construction rules in Tehran in order to meet the needs of family. This indicates a lack of response to housing policies or unsatisfactory policies for various groups of society. Thus, it is necessary to make attempts in complying rules and standards in building with social, economic and cultural conditions of people. On the other hand, it should be noted that the motivation for meeting the needs of family, in addition to social aspect, has economic aspect as well. For example, a building as a saving for the children's future, housing development for providing more living space for the family members, the construction of additional storeys for collecting money from their rent or meeting increasing household costs, and etc. all are economic incentives. Many residents after the initial awareness of many benefits of construction are entering in this industry attempting to develop the land and residential spaces. Therefore, the roots of building density violations can be property speculation, inappropriate system of employment and unfavorable distribution of income. Improving the quality of supervision on constructions, promoting law-abiding sense among the residents, the employment of specialists for constructions, making residents and groups involved in the construction aware of the consequences of building violations and the importance of construction standards, establishing training programs for constructioneers related to urban development, rating the quality of buildings (in term of sustainability, safety, design and energy consumption), managing the public investment on social and economic projects more effectively, the use of appropriate equipments to monitor and manage the growth rate of city (e.g. using smart codes), and requesting violators to compensate more decisively instead of just issuing fines can be effective in controlling these illegal and profit-based activities in Tehran as well as other cities of Iran.

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Kopsavilkums. Lielākā daļa Teherānas metropoles problēmas ir saistītas ar būvniecības likumdošanas pārkāpumu veidošanos. Publikācijas pamatā ir izmantota aprakstošās analīzes metode. Apskatīti faktori, kas saistīti ar būvniecības noteikumu neievērošanu un to kvalitāti Teherānas pilsētā. Ņemot vērā pastāvošo būvniecības politiku un ar būvniecības kontroli saistīto darbību pārskatu, tiek secināts, ka nepareiza pilsētplānošanas īstenošana Irānā ir pretrunā ar pieņemtajiem standartiem un detālplānojumiem. Galvenokārt tas saistīts ar apbūves blīvuma pārkāpumiem, kas radījis urbāno slodzi uz dabas pamatni. Problemātika ir saistāma ar valsts ekonomiskās politikas jautājumu sakārtotību un to pielietojumu.

Viens no galvenajiem pētījuma aspektiem ir attiecināms uz zemesgabalu izmantošanas kontroli. Pilsētu teritoriju apbūvē galvenokārt dominē dzīvojamās zonas, atstājot novārtā normatīvās prasības, kuras ir svarīgas izpildīt publiska rakstura apbūvei - skolām, parkiem, mošejām, ceļiem, publiskai autostāvvietai, tirdzniecības centriem, gājēju celiņiem, atklātajām un zaļajām zonām. Ēku projektēšanā un apbūves blīvuma izvērtējumā ainavtelpai nav veltīta pietiekoša uzmanība valstiskā līmenī.

Ekonomiskās un sociālās problēmas valstī ir grūti risināmas, jo tas saistīts ar pieredzējušu speciālistu trūkumu pilsētas plānošanas lēmumos. Minētais apstāklis ir ietekmējis pat vēsturiski tradicionālo pilsētas struktūrālo uzbūvi. Ir ierosināts, ka Teherānas pašvaldībai nepieciešams paplašināt sociālo sektoru un apsvērt to lielo lomu pārvaldības programmās. Pārkāpumi ir saistīti ne tikai teritorijas plānošanas līmenī, bet arī būvniecības procesos. Diemžēl, būvniecību Teherānā lielākoties veic neprofesionālas būvnieku grupas, kurām finanšu priekšrocības ir svarīgākas par ēku kvalitāti un drošību. Daudziem iedzīvotājiem ir motivācija pārkāpt būvniecības noteikumus Teherānā, lai apmierinātu šauri privātas intereses. Piemēram, privātīpašumā esoša ēka kā ietaupījums bērnu nākotnei un, lai nodrošinātu savas ģimenes locekļu dzīvojamās platības palielināšanu, tiek veikta nelikumīga papildus stāvu izbūve ēkām, tā veidojot īres platības uzkrājumus utt. Apbūves blīvuma palielināšana ir veicinājusi spekulācijas ar nekustamo īpašumu, nelikumības nodarbinātības sistēmā un ienākumu sadalījumā. Līdz ar to ir vajadzīga virkne pasākumu - būvniecības pārraudzības kvalitātes uzraudzība, likumdošanas juridiskā sakārtotība, būvniecības speciālistu nodarbināšana, un būvniecības standartu ievērošana, ēku kvalitātes novērtēšana (ilgtspējības, drošības, dizaina un enerģijas patēriņa ziņā), efektīvāk pārvaldīt valsts investīcijas sociālajos un ekonomiskajos projektos, izmantot atbilstošas iekārtas, lai uzraudzītu un pārvaldītu pilsētvides attīstību. Stingrākai ir jābūt nelikumību kontrolei, likvidējot "melnās " peļņas balstītās darbības Teherānā, kā arī citās Irānas pilsētās.