Architectural Town-Planning Factor and Color Environment

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Abstract: During the civilization development people have been establishing cities in opposition to nature as the largest and most consistent form of spatial society organization. According to the information submitted by World Health Organization the urbanization processes lead to increasing number of psychical disorders and this sets various objectives for architects, urban planners and designers aimed at increasing environment comfort for people. The author of this article questions the need for complex task solution regarding the creation of comfortable urban environment, this is next to impossible without knowing the theory of colors and world color culture, it is also impossible without knowing psychological and emotional effects of colors.

Key words: Architecture · Town planning · City · Color environment · Coloristic description · Color psychology

INTRODUCTION

Under the laws of the Russian Federation town planning is defined as "goal-oriented activity of the nation, intended for creating favorable environment for citizens, taking into account the details of existing inhabitance, perspectives of social and economic society development, national, ethnic and other local properties" [3]. Hence, the goal of the state policy is to create comfortable environment for its citizens.

During the process of civilization development humans have established cities in opposition to nature as the largest and most consistent form of spatial society organization. Second nature which was artificially created during the development of civilizations is now its integral part and surrounds us in everyday life and determines our perception [7].

City growth and development has lead to the number of widely known problems: overpopulation of cities (in historic centers), transport traffic, absence of attractive environment, homogenous areas (homogenous habitat in new residential areas) and the feeling of loneliness, which is inevitable in such cities, that follows with severe psychical disorders. According to the data

provided by World Health Organization the urbanization processes lead to increasing number of psychical disorders and this sets various objectives for architects, urban planners and designers that aimed at increasing environment comfort for people.

It is impossible to find complex task solution regarding the creation of comfortable urban environment without knowing the theory of colors and world color culture, it is also unachievable without knowing psychological and emotional effects of colors [4].

Architectural and town planning activities need to use colors at their full stretch: it is necessary to know the features of color perception, form creating activity, semantics and importance of colors while creating architecture projects, district or cities. It would be wise to include color project engineering for cities in the general system of artistic and architectural town planning engineering and to examine engineering using the system as integral dimensioning and color engineering should be examined as architectural art work [5].

Main Part: The complex of color problems causes an actual need to coordinate the studies of different aspects of color phenomena, it requires understanding of color

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Pic. 1: An example of original color solution in architectural town planning project engineering

problematics which is outside the borders of various knowledge and activity spheres. Question regarding the use of colors have always been a major component in the process of organizing human objective environment. The role of colors in our everyday life is diverse, conditions require expansion of object types in objective dimensional environment, including new types, functional upgrades and renovation of the existing ones. Colors are a part of structural thinking, they are components of objective dimensional environment as well as elements of material and spiritual cultures.

Color solutions for living environment created around us significantly affect our mind and health as well as functioning of human living processes. Increasing intensity of applying colors in modern everyday life, increased number of artificial color carriers, the increase of using colors in the surrounding environment, obvious preferences of colored objects instead of monochromatic among the consumers – these facts allow us to select the features that characterize the positioning of colors on the current phase of our society development. These facts are a result of objective processes that take place in society and influence social, cultural, spiritual and communicative factors of the modern civilization [5].

The problem of creating color relations has become more relevant in XXI century with the vast variety of buildings and objects appearing in cities which have unique functions based on the latest technologies, they tend to acquire new conceptual and philosophical meaning which includes new forms and principles of color combinations in city areas. There is also development of new architectural schools in common practices. Obviously, in order to identify physical objects and practical orientation in the world two colors would be enough – black and white. From this point of view the wide range of color shades perceived by human beings is

excess. However, the colors play key role in the perception of surroundings and are not only needed for spatial sensing. Spatial perception is complemented with emotional base that widely enriches and complexifies categories of harmony and beauty. This is why emotional effect of colors on human mind is a significant factor that requires systematic studies.

This interconnection requires scientific techniques in order to add or specify organization of integral color scheme questions in the areas of the cities. In order to find the solutions it is necessary to apply complex approach with in-depth analysis considering all color organization principles of architectural ensemble, separate construction and all built up arsenal of architectural and artistic heritage left from previous generations. The colors and forms of spatial city objects organize ensemble perception or completely destroy it. Color plays key role in human spatial orientation, formation of favorable psychological comfort, transfer of functional contents, emotional aesthetic effects and finally in introduction of artistic world pictures in cultural part of social life.

Identification of color importance in various historical cases is very important, extensive and polymorphous. In order to accomplish our work we were mostly interested in studies of urban color problems and issues regarding colors as a category of architectural works, presented by A.V. Efimov. According to A.V. Efimov "absence of color contacts with natural surroundings, ignoring color experience of the past and inability to use polychromy in order to contribute to social spatial processes of the city shall result in dissatisfaction with color atmosphere in most of our cities. People who have grown up in grey concrete landscapes of new various buildings do not try to transform them as they consider their look to be in accordance with aesthetic standards. Ability to aesthetically feel discomfort due to surrounding greyness atrophies and the person becomes insensitive to perceiving the color picture of the city. This tells us about cultural and social educational role that harmonizes the color scheme of the city" [2].

Coloristics is a science of colors in architectural and design project engineering. It uses physical basics of colors and psychophysical perceptive basis. At the same time it takes into account cultural color pictures of society and this is why it can be applied to all spheres of its existence [4]. Whereas the colors of urban environment create the picture of its spatial impression, aesthetic and spiritual contents, they can be separated from the urban environment and describe the color environments of settlement areas in modern cities.

Generally, modern cities are concentrated in industrial establishments forming the core of the city. Especially this applies to relatively young cities that are less than hundred years old and have been founded as a result of residential areas built around metallurgy, ore extraction, industrial production and other industries.

In the older cities new buildings surround the historical center, developing in accordance with the nature of landscape, functional viability and social interpretation.

Structure of modern cities is mostly a result of evolving architectural and town planning practices during the past centuries. It will be fair to claim that the first part of XX century had the most influence on the planning in most modern cities, at these times principles of neighborhood development were introduced to settlement areas in cities [1]. These principles were being developed simultaneously in the Soviet Union in the twenties and thirties. Soviet and eastern architects were concerned about the planning challenges in large cities and difficulties regarding correct and comfortable organization of people's lives and households within the areas limited by city routes. Another problem that architect engineers tried to solve by means of creating residential districts was a need of unloading town centers and spreading them into outer areas.

Residential district – is the most common plan for a modern residential neighborhood, it involves couple of residential neighborhoods as well as buildings of primary social services: shops, schools, institutions for children, club buildings and leisure areas [6]. Residential districts in the settlement zone represent the tissue of the city and main transport and pedestrian routes are its skeleton. Judging from this structural organization of urban environment we can assume that tissue and bones of the town in its different parts must have different functions, social and psychological features that affect their coloristic solution.

Russian architects and project designers for the past couple of decades started considering coloristic solutions for interiors and facades of separate buildings. Generally, this relates to private cottages and residential high block buildings or corporate offices and shopping centers. It should be noted that fragmentation and irregularity of architectural design approach to coloristic solutions of urban environment overall results in integral formation of coloristic picture in urban environment remains beyond the interests of modern architects.

Bedroom communities in modern Russian cities are still a heritage of soviet times [11]. Typical "Khrushevka" buildings had been used to solve high priority problems from the end of fifties to mid-sixties during the twentieth century – that was providing maximum number of individual living area for citizens. Typical panel construction has determined dull grey coloristic scheme of Russian cities for several decades [9].

It is known that every separate color has its effect and particular influence on the human being: physical, psychological (emotional), symbolic (informative), aesthetic, ecological (form-creating in architectural solutions). Color – is a very powerful tool, it is one of the strongest factors affecting mind, mood, health (well-being) and visual perception of premise space.

When we are using colors in urban environment any color associations and preferences should be noted [5].

Physical objects are often fundamental for psychological perception of colors, they allow us to record information about the surrounding world in psychological dimensions. It is known that all colors affect human beings and mean various things. Perception of color depends on the lighting as well. Symbolism is one of the aspects of psychological color perception. Colors affect human emotions in many ways, depending on the age, beliefs, places of residence, nationality and social status they imply different things. It should be noted that color and color shades additionally affect the body and our subconscious part independently from psychological perception. Color perception results in changes to nervous system, under the influence of particular colors one may experience alteration of his health and fitness conditions.

Practical studies of colors affecting human body have been carried out from the start of XX century [5]. Experiments at the start of the century have proven direct effect of colors on body's physical functions. Knowledge of physical and psychophysical effects of colors on living organisms (including humans) have allowed scientists to develop color therapy methods and prove on practice that, for example, a monochromic scheme of habitat results in color fatigue, but polychromic scheme positively affects vital functions in human beings of any age [8].

Color is the easiest and most effective tool used to alter spatial perception and it allows us to correct health conditions of people. This is why most of Russian cities are regarded as unfavorable for positive and comfortable living [5].

Based on this it is necessary not only to design modern cities in accordance with coloristic, psychological, social, symbolic and aesthetic picturing factors, but also to perform precise analysis and color reconstruction of existing residential districts.

At this point we would like to describe one interesting experiment of medium-sized town called Muravlenko (population of about 37307). This town had mostly typical panel housing of the late eighties or mid nineties in twentieth century, but in the beginning of the new century it was decided to realize a project on coloristic reconstruction of facades in the settlement areas. Using modern finishing materials that could withstand climate changes facades were painted in bright, light colors, this has completely changed the perception of town's architectural environment.

We have to mention that several of the prevailing factors in the success of experiment were how distant the town is from the city centers and its actual size. This area is located in the territory with severe climatic conditions and its citizens are mostly occupied in oil refining industry. It is obvious that state authorities have accepted this experiment motivated by idea of creating more comfortable psychological and aesthetic environment for its hard-working inhabitants. Results can be accessed from several points of view. On one hand we can notice particular naivety and absence of composition integrity of such urban environment reconstruction. Some streets were reconstructed without taking into account "side scene" perspective, aerial perspective and visual means of communication. On the other hand psychologically such environment is very comfortable and positive and of course this improves the psychological atmosphere in the town which faces severe climatic challenges.

In the history of modern architecture there are examples on non-standard approach to color textures used for decoration of residential and social buildings. First experiments were performed in the times of Western European modern, this can be seen in works of Spanish modernist Antoni Gaudi. Using the rich traditions of ethnic coloristic approach this brilliant architect had created unique city areas that are now a part of Barcelona settlement areas. Individual color texture approach to every element of architectural objects, starting from buildings in town center to MAF in Guel park, strongly contrasts with typical buildings common for these times, defining the humanistic character of his architectural projects.

Austrian architect Friedensreich Hundertwasser is equally interesting for our research, he is the following ideological successor of A. Gaudi, he realized principles of humanistic architecture not only using ecologically friendly materials, biomorphic architectural effect and

Pic. 2: Antoni Gaudi, Guell Park, Round Bench

Pic. 3: Antoni Gaudi, Balio Building, Passeig-de-Gracia

Pic. 4: Hundertwasser's House, Vienne, Austria

proportions harmonic for human perception but also with applying individual approach to coloristic solution of building facades, interaction with surrounding environment and original use of green plants.

Hundertwasser's house is not only a residential building, it is a "machine for living" as Le Corbusier said. The house is personal living space on the first place and it reflects the lifestyle of its owner, allowing him to realize his creativity using coloristic and artistic transformations of his own urban environment element. This approach can be considered as unsystematic and that it destroys visual city structure, but doubtlessly its approach is humanistic and this allows us to analyze it as a trend of town building, architectural and project designing.

We should mention that perception of color solutions in the urban environment is different from indoor perception. This can be defined using the following factors:

- Large size of open areas that determine specific perception nature common to aerial perspective (lack of focus on distant views), conventionally limited separate areas and "side scene" structure of in-depth spatial composition;
- Complex functions of city walls in the open space, walls can have utility, social, symbolic and aesthetic functions;
- Landscape components located in the spatial area of city structure, starting from landscape type and existence of water areas to green plants and horizon views, these factors directly affect coloristic picture of the city;
- Weather-climatic and time factors as color perception of urban environment does not only depend on day and night changes, but also on the seasonal alterations.

Besides for the abovementioned objective factors that affect coloristic environment perception of city areas, other following elements of urban environment can be outlined:

- Road surface. Color of asphalt on the driving roads cannot be changed not only due to high wear ability of paint coating, but also because of road regulation normative standards. However, color facture solution for pedestrian crossings assumes range of choices in order to deliver the idea; therefore it provides us with a number of choices regarding aesthetic and informational/communicative functions.


Pic. 5-6: Villa Savoye in France by Le Corbusier

- Building facades. Modern technologies provide variety of creating and reconstructing color schemes for facades that already exist or are just being built. The most common choices of façade technologies are the following: lifted facades, finishing with decorate plasterwork and painting with structural paints. Also, glazing of facades allows us to choose not only the color scheme, but transparency and reflection ratios as well.
- Hardscape elements (MAF) and lesser architecture products (MAC). Such environment elements as MAF do not affect color environment of residential areas and neighborhoods as roadways and facades do, but only they can "humanify" urban environment, adding picture characteristics and creating positive psychological atmosphere of mesial areas. Lesser architecture products – stop stations, local trading points etc. have a role of spatial beacons which allow citizens and guests to orient themselves in the territory and this already puts them into strict margins regarding any color solutions.

- Natural planting. Green plants create different color environments depending on the time of the year. The most effect is in autumn when colors of leaves become softer, the least effect is in winter and early spring.
- Means of visual communication and advertisements. Advertising is one of the most aggressive factors that affect development of coloristic perception in urban environment. There are various advertisement banners, board and stretches that are quite decent in size, but there are also information boards, advertisement boxes (illuminated), sign, displays and monitors which due to their nature color surrounding objects in various and non-natural colors. The number of advertising objects in modern cities keeps increasing and exceeds color perception of urban environments, it requires further studies and adjustment works regarding its numbers and quality in settlement areas of the cities [5].

Summary: As to conclude, it is necessary and will be reasonable to create harmonic coloristic scheme of the urban environment. Colors may (and this is very important for urban space) change our perception about the sizes of areas, it makes us think that areas are bigger or less then in reality; correct color selection can "extend" or "narrow down" facades, "lower" or "lift" its particular elements [10]. Depending on the choice of color solution your town will be homy and comfy or "cold" and irritating.

Overall, the color solutions for environments that we create has a significant influence on our state of mind and health, it affects our well-being. Color climate of urban space reflects personalities and priorities of cultural societies, their tastes, favors, mentality, character and spirit [8].

HOTEL SILKEN PUERTA AMERICA (MADRID) © FOTO RAFAEL VARGAS
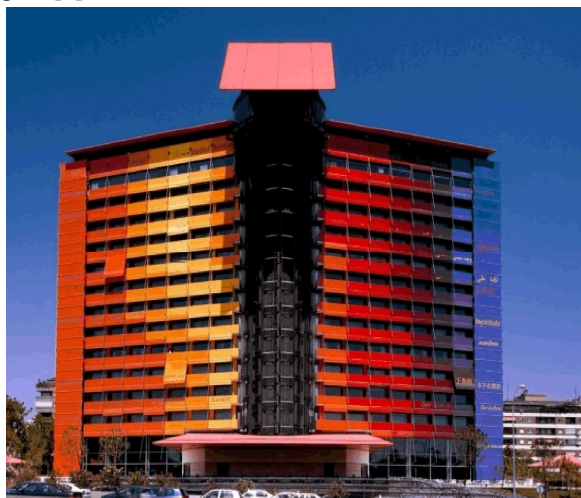
Pic. 7: 144 Residential area, Magnitogorsk, Chelyabinskaya region, Russia

Knowing particular color functions and techniques of using them it is possible to create harmonic color solutions and modify surrounding in order to partially satisfy material and spiritual needs, it shall also help in positive effect on people and their psychophysical feelings.

CONCLUSION

In this manner, architectural and town building activity requires full scale use of colors as every color transfers symbolic, emotional and aesthetic information, knowledge of these features allows us to understand its spatial perception, creative impact, semantics, its role in artistic picture of architectural creation, district or city. It would be reasonable to include designing of urban coloristics into general system of arts and architectural engineering and to analyze it from the point of the system as integral spatial, dimensional and color design engineering, as complex art and architectural work.

Complex of color problems requires substantial need to coordinate study of various color phenomena, to create color problematics outside the limits of different knowledge spheres and activity fields. Colors play a very important and multiform role in our lives, colors are attached to our thoughts, they are components of spatial and dimensional surroundings, a part of our physical and spiritual culture.

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