Global Concepts in the Architecture of Sustainable Development

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Abstract: The study summarizes some of the data on global concepts in the architecture period from the beginning of the twentieth century to the present day. As a result, two major types of concepts were revealed: the industrial and the postindustrial period. A lack of co-study with social affairs in the architectural concept of post-industrial period has been identified. The formation of ideas about the prospects for the development of the concepts of architecture of post-industrial period.

Key words: Architecture, sustainable development, the industrial period, the post-industrial period, global concepts

INTRODUCTION

The extent of studying of the problem: Works of following personalities induce the interest for present study: Grigoriyev and Ogorodnikov (2001), Gutanov and Glazichev (1990), Bunin and Savarenskaya (1979), Soleri (1969), Ladovski (1930), Kolyasnikov (1999) and many others whose interests are in varying degrees related to the disclosure of the problem of sustainable development of architecture.

Formulation of the problem: Philosophy and fantasy have always been and always are present in the architectural creative activity. Maybe that is why at all times, thousands of architects have paid so much attention to large-scale projects meant to significantly improve people's lives. Here it goes about Dinocrates with his Alexandria of Athos, Giovanni Piranesi, Antonio Sant'Elia, Pieter Bruegel the Elder, Etienne-Louis Boullee and many other artists whose work has had the most profound influence on the development of architecture during last two millennia. The ideal cities of the past are philosophical and speculative concepts that have found a worthy continuation in the paper architecture of the USSR of 80's of the 20th and virtual models of the 21th century. But another branch of this trend is much more interesting, it has been actively developing during last hundred years and is being associated with trailblazing architectural experiments of Le Corbusier, Lucio Costa, Oscar Niemeyer, Kisho Kurokawa, El Liszickij, Yakov Chernikhov, Jacque Fresco, Paolo Soleri and many other architects who have become creators of bold projects and have laid the basis for the era of global

concepts in architecture. Touching on the subject of global concepts in the architecture, a logical question emerges-what caused such a high interest in hypotheses and concepts designed to change all humanity? The answer to this question will lie with a high probability in the fact that that over the past 100 years the ratio of urban to rural population of Europe changed from 30-60 to 73-27% (average data) for the overall growth of the population of 383 311 000 people in 1900 to 738, 523, 843 in 2011 (2013).

The explosive growth of the world population combined with the scientific and technological revolution have created a need for a radical revision of ideas about the modern city that would meet the new realities of modernity. And the development of mass media in its turn, made the process of creating a new architecture concept global.

Thus, since the beginning of the last century there emerged architectural concepts which can be called global architectural concepts and it would not be an exaggeration. The term global architectural concept can be formulated as follows: an architectural concept which had become the subject of discussion by the international community of experts had been included later in the educational literature and became the basis for the development of new architectural trends. At the present stage these are new architectural and construction concepts that have millions of references in the media. The difference between the Global Concept (GC) from the global style is that GC is focused on the optimization of functional and social aspects of architectural environment and is ready to handle any styles if they do not contradict the basic idea of the concept.

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Results of research

The garden city by Ebenezer Howard: The idea of the garden city was first described in the book "Garden cities of To-morrow" (1898), written by the British sociologist and utopian Ebenezer Howard. Howard believed that the current (as of time of writing of his book) way of city creation has become obsolete (Howard, 1902). The chaotic, unrestricted growth of the industrial city as well as its unsanitary and inhumanity (in more general sense) were criticized strictly. As an alternative, Howard offered a concept of a small town which would combine the best properties of town and country. Howard managed to organize an association for the construction of garden cities. In the first decade of the 20th century, the association built two new garden cities in England-Letchworth and Welwyn. After World War II a program of construction of satellite towns around London was adopted in the United Kingdom. The project was headed by the architect-planner Patrick Abercrombie (Abercrombie, 1967).

In the first half of the 20th century the idea of the garden city was popular in many countries, although, nowhere its embodiment has reached such a scale as in Britain.

Russia: garden city in Barnaul, village Sokol in Moscow, village Druzhba in Mytishchi, garden city Krasniy in Rostov-on-Don, village garden Oktyabrskiy in city Vologda; Sweden: Sodra Angby; Belgium: garden district Le Logis in the Brussels commune Vatermal-Buatfor; Germany: garden-districts in many cities, such as Hamburg (Wandsbek-Gartenstadt), Essen (Essen-Margarethenhohe), Konigsberg (Ratshof and Amalienau, now part of Kaliningrad); Spain: Park Guell, designed by Gaudi in Barcelona. The park was originally designed as a garden-district but there found nobody who would like to build a house there (Grigoriev and Ogorodnikov, 2001).

The city of future by Eugene Enar: Eugene Enar after the long period of studying the problems of urban transport of cities of that time outlined his vision of the future of the city at a London architects conference in 1910. The main content of his speech was reduced devoted to the analysis of the state of urban public utilities of major cities of the late 19th century and the justification of the proposals for the development and improvement of the urban structure in the future. Eugene Enar proposed the following scheme for the cities of the future:

- The streets have to become pedestrian
- Public transport (tram) should be placed under the causeway

- Urban engineering systems and mechanisms of utilization of city garbage should take the third level from the ground
- The lowest level shall serve as an underground route for heavy trucks

Cite industrielle, project for an ideal city by Tony Garnier: The search for a new beauty, new and better order in urban planning is clearly noticeable in the Industrial city by Tony Garnier, a project created back in 1911. His vision of a plant is not a random cluster of heterogeneous structures any more but a well-planned single functional organism. Uptown is conveniently linked to the production area and at the same time separated from it by green areas. The living homes themselves are open to the sun, the fresh air and surrounded by greenery. The size of the town proposed by Garnier is small-it is designed only for 35 thousand inhabitants but it is interesting that the researcher-architect had imagined an industrial city very far from its real prototype-not an impregnated by soot, dust, a chaotic, devoid of memorable characteristic appearance city but on the contrary a bright, clean, ordered place with attractive architecture. Noticed by few at the time of it creation, the work of Garnier, later on influenced greatly on the subsequent development of ideas about the modern city (Gutonov and Glazychev, 1990).

The big city by Otto Wagner: Otto Wagner (1841-1918) in his project of the Big City proposed the socialization of all land necessary for the continued growth of cities which would make it possible to regulate the price of land and control the development of the city (this system has been implemented in Amsterdam). After 30 years in 1933, at the Congress in Athens, it was demanded that "each city has to create a master plan of its location and development and ensure its implementation" as it had been earlier proposed by Wagner.

The city of skyscrappers by Auguste Perret: Auguste Perret, a famous French architect, offered the project of a city (1905), consisting of a 65-storey skyscrapers, connected at half of its height by transport flyover-bridges.

The machine city by Antonio Sant'Elia: In 1914, the architect Antonio Sant'Elia showed at the exhibition in Milan 16 architectural fantasies on a topic A New City a Machine City. His drawings are reminiscent of Piranesi fantastic etchings. Explanatory note to the series called Manifesto of futuristic architecture. It became a new aesthetic ideal and became the basis for the emergence of

a new architecture in the 20th century. In addition, Antonio Sant'Elia introduced the principle of a multi-tiered architecture in his fantasies; this image had been subsequently used by many architects (Hilberseimer, Friedman, Tange, Isozaki and others).

Linear city by Arturo Soria y Mata: The idea of linear city was first proposed by the engineer Arturo Soria y Mata and even started to build one on the outskirts of Madrid: it was a narrow strip along the highways. According to the plan 30 thousand people could live there. The zoning has been well thought out-all functional areas were stretched in endless strips. Ideally, according to Soria y Mata's idea, the whole country could be covered with a network of such strips. The idea of a linear city has received a wide development (Bunin and Savarenskaya, 1979). Milutin referred to it in the book Sotsgorod and Le Corbusier used it in his book: "The Linear Industrial City". In 1959, a group of young Soviet architects proposed a new form of settlement (the NER) in the form of a complete, closed structure of residential structures and linear, continuously developing (public) structure for economic and cultural activity (Polyak and Markova, 2013). In 1961, Central Research and Design Institute for Standard and Experimental Design of living premises of the Academy of Building and Architecture of the USSR proposed a scheme for the linear city, consisting of a series of so called combined areas.

RADIANT CITY FOR THREE MILLION INHABITANTS BY LE CORBUSIER

In 1922, at the Salon d'Automne in Paris, Le Corbusier presented his first major urban development project: The Radiant City for 3 million inhabitant-"La ville radieuse". It was a hymn to light, air and greenery. Le Corbusier placed skyscrapers of the same size in the center. They would stand in gardens, at an equal distance from each other. Skyscrapers gave the population density, freeing the open spaces for greenery. The architect rejected the close and multi-scaled experience of the New York City. There was a central station at the center of the corbusierian city: a transport junction for airplanes, cars, buses, subways and railways. Later, a similar project (naturally, without airplanes) was implemented in Paris La Defense. Around the center of La ville radieuse 6 storey meander-shaped blocks consisting of thousands of living blocks were planned. The same scheme with almost no changes has been offered by the architect for Paris in his work Plan Voisin, 1925.

Now a days, the question of protection of monuments would definitely come up. But the situation was different at that time. Le Corbusier as well as other progressives of those times, was not so much worried about the plastic delights of the old quarters but about many social problems. He therefore sought, first and foremost to sanitize rotting, overcrowded areas, home for poor people. Leaving the Cite Island untouched and retaining the most important buildings, he relentlessly bore all so called environmental development.

The dynamic city by Nikolai Ladovsky: Having analyzed the strengths and weaknesses of the rational-ring and linear schemes of city planning, Nikolai Ladovsky proposed an entirely new planning scheme. As a result, there was obtained a new schematic layout that managed to combine the advantages of radial-circular and linear circuits and at the same time not to repeat their drawbacks. Ladovsky's Parabola made it possible to develop a citywide center while maintaining its role as the core planning. The center has developed on the parabola axis to adjoin the residential areas which were placed for industrial and green zones. The Parabola by N. Ladovsky was first published in 1930 together with his article containing the theoretical substantiation for the concept of planning schemes for a developing city (Ladovskiy, 1930).

The city of high houses by Ludwig Hilberseimer: To liberate city from the despotism of plants in his book "New Town", Ludwig Hilberseimer proposed placing them outside the city in regular intervals, at large distances with their own villages located on the windward side. Despite the positive aspects of the project, the proposal had a number of serious drawbacks: large areas of agricultural land were to be destroyed and industrial villages would be virtually deprived of cultural and community services due to large distances from the center. In the book "The Essence of Cities" Hilberseimer proposed a radical reconstruction of Chicago the city had to become a three-tiered where people would live under their work place, located at ground or underground level.

Sotsgorod: Since the late 1920s, the center of the solution of theoretical and practical issues of urbanism and especially the placement and planning organization of the city industry is moving to the USSR where both industrial construction and construction of cities were being carried out on an unprecedented scale and pace. For the first time in the history of architecture theoretical and practical development of problems of complex accommodation and comprehensive planning organization of industrial areas of the city was carrying out from fundamentally new positions. To solve these problems a number of Soviet

theorists and designers worked on it in 1930s: Zilbert, Nikolaev, Milutin, Popov, Fissenko, Myslin, Zlatolinsky and others. A number of projects have been implemented in the correspondence to the socialist architectural principles: ZIS and Sharikopodshipnyk plants in Moscow, a car factory in Gorky; the Magnitostroy, the Vagonstroy in Nizhny Tagil, a number of sots-cities, Dnipropetrovsk hydroelectric power station. A city for socialist society seemed to be the highest goal of the architect's profession. But the opinions of experts were split into two trends: the Urbanism concept proposed economist L.M. Sabsovich and the concept of de-urbanism developed by sociologist M.A. Ohitovich. Both concepts as history has shown, were equally utopian.

The basic principles of modern urban city were formulated in these studies; transport junctions, the elimination of the street in its traditional sense, reinforced concrete tower houses, use of flat roofs, multilevel streets with the division of transport types, urban transport classification, functional zoning. Most of these innovations to some extent, was generalized in the Athens Charter of 1933 which became a kind of manifesto of modern urbanity.

In the 50-60's of 20th century a new type of urbanist concept based on the use of spatial building structures emerged. The concepts of this period include.

The structural city by Yona Friedman: According to this concept a city was a gigantic grating towering 20 m above the ground and consisted of vertical supports and several tiers of platforms. Some lattice of the grate remained open to pass the sunlight to the lower levels of the structure, most were filled with multi-functional space modules. Highways locate on platforms and elevators and all utilities were placed in vertical ducts. Using city tiers, it was intended to strictly regulate the height of separation from the earth; the upper levels were designed for housing and recreation, bottom ones for service enterprises. Friedman considered the ability to separate the different functions of the city on three measurements and increase the area at the expense of increasing the levels hinged the main advantage of the project. City was to hang above the ground in Space and then there would be no need to cut down hectares of forest to comfortably resettle several thousand people as they do today. Visionary architectural invention of the middle of the last century has not lost its relevance and at the beginning of the 21th century (Freedman, 1983).

METABOLISM; TANGE KENZO AND OTHERS

The movement of a group of Japanese architects calling themselves Metabolists have formed in the early 70's.

This group includes: Kenzo Tange, Kionori Kikutake, Kisho Noriaki Kurokawa, Masato Otaka, Arata Isozaki, Noburu Kawazu, Koji Kamiya and others. The group denied the principle of finality of architectural form. They used the concept of biological metabolism to describe the structure of the city a cyclic sequence of steps which they believed is subject to the dynamics of human society.

In his studies Tange Kenzo assigned a task of architecture of that time as follows: "the architecture combines the functionality and expression, content and form these keystones with their own integral truth and logic. Combining and merging them into the organic whole a structure that would meet both material and aesthetic requirements this is the architectural creativity indeed". "We live in a world in which absolutely incompatible things live side by side: human and superhuman scale, stability and mobility, persistence and variability, individuality and anonymity, limitations and versatility. This is the result of the gap between the technology, progressive in its development and humanity as a historically established phenomenon. This is a problem of struggle of technology against humanity and in our times the task of a city planning architect is to throw a bridge between them" (Kulterman and Tange, 1969).

The spatial city by V. Jonas: Jonas sees the city, composed of terraced residential funnels 100 m deep, each of which is designed for 2 thousand inhabitants. Windows of each apartment overlook both the internal, intimate space a crater-like yard and the external space. Each crater is a separate city block. These funnels connected by a jumper at the top form a city. The project's objective is to revive the urban commune and free the surface of the earth as much as possible.

Cybernetic city by Nicolas Schoffer: He started with an innovative paintings and unique space-dynamic sculptures and then came to the idea of creating an interactive entertaining cyber-city. He offered to share it according to axes: residential areas should be linearly positioned horizontally and all business, commercial and industrial institutions should be placed in giant skyscrapers in height of up to 1,500 m. From the Schoffer's point of view, a compact construction would make the entire urban infrastructure more flexible, would make all internal contacts easier and faster. Skyscrapers would be placed inside colored rotating lightning shells, illuminated from the inside and outside by powerful spotlights. City life would be managed by a powerful electronic brain that regulates all the mechanical processes from lighting and ventilation to the work of transport and utility systems. Cybernetic cities could be made in different genres; summing up it should be noted

that living in them would have been a pleasure but in spite of quite a convincing concept of rationality, the project has remained as a utopia, though exceptionally beautiful one.

Archology by Paolo Soleri: Archology is an architectural concept that takes into account environmental factors while designing environment for a human. Basic principles of archology were developed by Italian-American architect Paolo Soleri. In a narrower sense, archology also expresses the idea that erecting large, self-contained, well-designed, multi-level structures (hyper-structures), accommodating a population of a whole city, the negative impact of settlements on the environment can be significantly reduced. Hyper-structures are also called archologies (Soleri, 1969).

MILE HIGH ILLINOIS SKYSCRAPER BY FRANK LLOYD WRIGHT

A tower 1609 m (528 floors) high was invented by Wright for the city of Chicago and would definitely have become the tallest building in the world, if implemented. Wright sincerely believed that even in the late fifties, it was technically possible to project and build such a high building. At that time steel was used as the material for the supporting structures of high-rise buildings which would become the reason for significant fluctuations from wind loads. These vibrations would have caused discomfort for visitors of upper floors. Despite this, Wright claimed that his design scheme was quite efficient. The construction was planned to have the form of a tripod at its base, the central core would be made as a metal frame in lightweight concrete, each floor would be attached to the core in a cantilever way, like branches to the tree trunk. The foundation of the skyscraper would also serve as a core, decreasing in size and looking like the root of a tree as penetration increases, it w\explains the name chosen by Wright-a tap-root.

But perhaps the most interesting part of this project is an attempt to analyze and understand the possibility of creating a vertical city. Such projects are very popular in our time independent and self-sufficient, energy-efficient buildings that can serve as both a home, place of work and leisure activities of a large number of people (for example, the Japanese Project X-Seed 4000). As for Wright's tower, the division into zones was also envisaged there: residential, office and government zones, recreation and entertainment areas. It was assumed that the tower will accommodate 45,000 inhabitants, plus 67,000 for the staff and visitors.

At long last, the project got nowhere farther than drawings and ideas of the architect. But now, when a skyscraper height of 818 m was built in Dubai, the idea to construct a building 1609 m high does not seem as a complete utopia.

Analyzing the dynamics of emergence of concepts of urbanistic type, it may be noted that the main productive ideas in this field were made in the first third of the 20th century. These ideas generally determined the course of urban development process throughout all the century. In the 50-60's certain limit was reached in the development of urbanistic concepts, when most of them were already a techno-utopia rather than a practical concept (city-skyscraper, total city, cyber city and so on). In this form, they were already not very suitable for implementation at the technical level that has been reached by that time. At the end of the 60s there is a sharp decline in creative search in this field which shows that the main path of urbanization has already been identified and research in this direction have been exhausted. The general characteristics of the concepts of urbanist type include the following:

- It was thought that the environmental problems of the city need to be solved by the mechanization of life support systems, development of engineering and transport infrastructure; therefore, the focus here was on the creation of conditions for the development of transport routes, the use of machinery, means of transport, etc
- The basic biological needs of the person in contact with wildlife were ignored or relegated to the background

The result of such clearly technocratic approach was that the modern type of city gradually acquired the features of a global machine (as it was foreseen by Sant'Elia), turned into a warehouse for mechanisms and people. In the 80's. concepts of a new time appeared, taking into account modern approaches of ecology and sociology of the living environment. They include.

Ecopolis by A. Brudniy and D. Kavtaradze: Scientists A. Brudniy and D. Kavtaradze gave the following definition of Ecopolis; adequate environment for life of humans and mutually-agreed relations between society and the natural environment theoretically ideal model of the Ecopolis is necessary for people to unite around the image of the desired future Ecopolis is above all people's attitudes to the nature and their relationships between each other. One of the first attempts to give a scientific justification for urban ecosystem management program was Russian program "Ecopolis" developed by biological faculty of Moscow State University (1978-1996) in the course of which there has been accumulated a wide experience of

Ecopolis projects-projects of a new type of environmental settlements, ideal not only ecologically and socially but also allowing to provide its inhabitants with the access to such important social values as creativity, communication, human solidarity. The idea of Ecopolis received broad support in the best social circles. On the basis of the environmental movement the attempts to create environmental settlements on the basis of small cities and towns have been made. These cities have become places of relatively high quality of life and environmental culture. The life in cities was based on the scientific, industrial, innovations and education. These cities are: Dubna, Zelenograd, Chernogolovka, Zvyozdny gorodok, Pushchino, Novosibirsk Akademgorodok, etc. At the beginning of the 90s the creation of eco-villages in Karelia (Nevo-Ekovil) in the Krasnoyarskiy Krai (Tiberkul) was started.

Biotic city by A. Tetior: Under its concept, the "biotic city" is a settlement where favorable conditions for the existence of all the living created: plants, animals and humans. Full-scale development of flora and fauna in the city is seen as a necessary condition for the full development of a human being as a part of nature. To solve these problems, it is proposed in particular to give the bio-positive properties to buildings and constructions. Such properties are the ability of buildings to organically fit into the natural environment to be adapted to the existence of elements of nature on the surface of buildings, save resources and not to require the construction of non-renewable resources, not to be obstacles on the flows of matter and energy, not to provide non-recyclable environmental pollution, create a high quality of life and so on (Tetior, 1996).

Noospheric city by V. Kolyasnikov: As part of its concept of V. Kolyasnikov, identifies the following principles of the urban environment organization as a complex self-organizing system.

Softness of control: It is impossible to rigidly impose the way of development of urban environment; it is important to understand the laws of co-existence between man and nature; control begins based on a combination of human impact on the natural and architectural planning subsystem with existing internal traditions of their development.

Variability of development: For the urban environment, there are several ways of development that should be provided for urban development projections and programs, the general plan or concept.

The ability of present to design the future: The current state of the urban environment is determined not only its past but the future is built on the basis of urban development forecasts, programs and plans.

Constructability of the whole: The construction of the urban environment and relatively simple parts and structures, agreed on the basis of the general rate of development; coevolution of structures developing at a different pace by means of incorporating genetic elements (a valuable historic and cultural heritage).

The effectiveness of the small: taking into account the small impact on the urban environment and subsystems as they can be extremely effective (especially in the period of change of phases of development).

The syncretic image: Is a complicated environment, i.e., a city that can be described by a small number of fundamental ideas and images (for example, the skeleton fabric, sustainable city noosphere city and others).

The openness of each point: The presence at each point of the complex system of sources and sinks as it is in the urban environment, makes it a kind of "circulatory system" an extensive engineering and transport and information technology infrastructure which provides a certain state of life at every point of a city.

The predictability of development: The use of synergetic model in urban planning the main components of which include the "hard core" (trends, goals, ideals), "a vague zone of hypotheses", "freedom of development" and "borders of wandering", established in accordance with certain parameters and regulatory conditions.

Peaking mode: Simulation of urban environment development, taking into account the slow development, passing a certain threshold and ultra-fast development as well as emergency situations

Dynamism and circularity: Removal of negative connotation from the image of unsustainable development of a city; mutual complementarity of stability and instability, without exaggeration of the value of one or another; alternating stages of sustainable and unsustainable development of the city (Kolyasnikov, 1999).

Sustainable city
Sustainable development: A process of economic and social changes in which the exploitation of natural

resources, direction of investments, the orientation of technological development, personal development and institutional change consistent with each other and strengthen the current and future potential to meet human needs and aspirations. Sustainable cities the organization of the urban environment so that, it meets the requirements of sustainable development (Mirkin and Naumova, 2009).

Smart city
Smart cities: May be defined as systems that are able to integrate the following axis of activity within a single urban space (Giffinger *et al.*, 2007):

- Smart economics
- Smart mobility
- Smart environment
- Smart people
- Smart life
- Smart management

These 6 axis must be connected to the traditional regional and neoclassical theories of urban growth and development. In particular, the axis are based on the theories of regional competitiveness, efficient use of natural resources, transportation mobility, information and communication technologies of city economy, formation of human and social capital is in priority, increase in quality of life as well as citizen participation in management of the city. The development of the concepts of the modern city can be represented in a generalized form as follows:

- 1890's; garden, linear city
- 1900's; industrial city
- 1930's; functional city
- 1950-60's; spatial, mobile city
- 1980-90's; environmental approach to the urban planning, social ecology of the city
- 1970-2000's eco-city
- 1990-present time sustainable city, smart city (Giffinger *et al.*, 2007)

Some of architectural urban concepts, popular during the last century, were analyzed above. These concepts are united by one thing in spite of sometimes being too futuristic, they all had the most direct impact on the formation of modern architecture. Besides, the division on the industrial and eco-friendly periods can be clearly seen in them, nominally separated from each other by the report "The Limits to Growth" for the Club of Rome, published in 1972. It contains the results of modeling the growth of

human population and the exhaustion of resources. This report was created with contributions from Donella Meadows, Dennis L. Meadows, Jorgen Randers and W.W. Behrens, Jr. (Grigoriev and Ogorodnikov, 2001). The report was based on data obtained from the computer simulation of growth of consumption of resources.

The main leitmotif of architectural and urban concepts in the architecture of the beginning of the 21st century was the fight against the causes and consequences of the ecological crisis. It's just an interesting challenge for some architects for others it explains the whole sense of their work, some are exploiting the public interest in the topic but there is no denying that the prefix ECO has become a brand, providing an increase in sales at all levels starting with projects of eco-cities and finishing with eco-shoes and eco-t-shirts. At the global level, environmental problems can be divided into three main groups:

- The technical group. In the case of architecture, this group is represented by its material organization for it to be positive in relation to human and the environment at all environmental levels-from visual to biological ecology
- The regulatory and legal group. Taxes and laws are the most effective factor in the organization of ecological architectural environment
- The ethical group. This group belongs to the most difficult one in the context of the sphere of social relations. Many researchers believe that the negative impact on the environment can be reduced greatly simply through the ethical consumption

A justified enthusiasm of the world's architects concerning the concepts of greening of cities, their reorganization according to new, environmentally friendly principles had overshadowed another problem the deformation of core factors of emergence of practically all big cities in the world. The deformation process has not been finished yet and so its borders are still not entirely clear but one thing is the most important phenomenon and is being often voiced by many researchers around the world-cities are increasingly moving from the sphere of industry to the sphere of service. And many architects naturally see a question here; who and what the city is serving for, how it effects on the structure of the city and how it is consistent with the principles of sustainable development that are passing in the category of proven theory at the present stage of the submission of the problem hypothesis.

Thousands of architectural concepts are being published in the mass media and convincingly

demonstrate the helplessness of many researchers in the context of the city-forming factor. This remark does not apply to prominent masters of the profession, their experience allows to successfully solve such problems but it can be easily seen in works of young architects, especially those developing the concept of archology. But even venerable architects are not always able to take full account of this issue, an example is the project of the general plan for Astana-city developed by renowned Japanese architect Kisho Kurokawa, the author of the Van Gogh Museum project in Amsterdam of the International Airport in Kuala Lumpur and the National Ethnological Museum in Osaka.

The Japanese architect which had created the sketch of master plan for the left bank of Astana, assumed that the population of the capital would reach the half-million mark by the year 2010. But in 2005, according to official figures, 537,000 people already lived in Astana. y 2015 the city's population was 871,230 people. An error in the forecast resulted in a lot of urban development problems (Banitskin, 2005).

CONCLUSION

The ecological crisis, its effects and the means to neutralize them can be considered sufficiently explored to have a certain degree of optimism about the prospects for the development of modern architecture. But the globalism and visibility of the problem have completely eclipsed another crisis, no less complex and serious in its consequences a social crisis associated with the morphological structure of the population. This phenomenon has become the reason of present research. Analyzing global concepts of the last century, two periods are clearly visible the industrial period and the period that is call the environmental by some researchers. But considering the city and architecture in terms of core factors the second period, dating from the (relatively) 1990 to present time is considered to be the post-industrial period. The Ford factories can serve as a demonstration of the differences of industrial and postindustrial periods 2 time; the 1914 and our days; two images the people standing shoulder to shoulder at the conveyor and thousands of square meters of workshops filled with robotic devices.

In the developed economies of the world, people are less engaged in productive labor, developing the intellectual sector of the economy and the service sector. This increases the level of welfare and happiness index (World Happiness Index. Humanitarian Encyclopedia (Meadows, 1991)) but the economic crisis of 2008 led many governments of the world to reconsider their

attitude to the country's economy. The architecture of post-industrial cities is a topic that needs to be thoroughly studied and the huge creative potential of thousands of architects, creating concepts of a new type of architecture can have the most significant impact on this process. It is significant to reveal the emphasis and direction of the proposed research and development right.

REFERENCES

Abercrombie, P., 1967. Town and Country Planning. 3rd Edn., Oxford University Press, Oxford, England, UK.,.

Banitskin, A., 2005. Error Kurokawa: Japanese architect to anticipate the rapid growth of the population of Astana. Centr Asia, Russia. (In Russian) http://www.centrasia.ru/newsA.php?st=1130996760

Bunin, A. and T. Savarenskaya, 1979. Urban Development in 20th Century in Countries of Capitalistic World. Vol. 2, Stroyizdat Publisher, Moscow, Russia, Pages: 415.

Freedman, I., 1983. Scientific Methods in Architecture. Stroyizdat Publisher, Russia, Pages: 160.

Giffinger, R., C. Fertner, H. Kramar, R. Kalasek and P.N. Milanovic *et al.*, 2007. Smart cities-ranking of European medium-sized cities. Master Thesis, Vienna University of Technology, Vienna, Austria.

Grigoriev, V. and I. Ogorodnikov, 2001. The greening of cities in the world in Russia in Siberia, analytical review. Master Thesis, Russian Academy of Science, Russia.

Gutonov, A. and V. Glazychev, 1990. The World of Architecture: The Face of the City. Molodaya Gvardiya Publishing Company, Russia, Pages: 350.

Howard, E., 1902. Garden Cities of Tomorrow. Swann Sonnenschein and Co Ltd., London, England, UK.,.

Kolyasnikov, A., 1999. Urban Development Ecology of Ural. Arkhitecton Publisher, Yekaterinburg, Russia, Pages: 531.

Kulterman, U. and K. Tange, 1969. Architecture and Urban Developemnt. Stroyizdat Publisher, Russia, Pages: 256.

Ladovskiy, N., 1930. About dynamic city planning structure. Moscow Building Supply, Inc., Moscow, Russia.

Meadows, D.H., D.L. Meadows, J. Randers and V. Jr, Burns, 1991. The Limits to Growth: Report of the Club of Rome's Project; The Complex Situation of Humanity. Moscow State University, Moscow, Russia, Pages: 207.

Mirkin, B. and L. Naumova, 2009. Sustainable Development: Textbook. Ufa State Aviation Technical University, Ufa, Russia, Pages: 148.

Polyak, G. and A. Markova, 2013. Textbook for High Schools. UNITY Publisher, Netherlands, Pages: 496.

Soleri, P., 1969. Arcology: The City in the Image of Man. MIT Press, Cambridge, Massachusetts, Pages: 122.

Tetior, A., 1996. City and Nature. Moscow Scientific University, Moscow, Russia, Pages: 230.