

## URBOECOSYSTEM AS A HUMAN ECOSYSTEM

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## УРБОЕКОСИСТЕМА ЯК ЕКОСИСТЕМА ЛЮДИНИ

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The uncertainty, contradiction and significant contrast of theoretical approaches to the selection of the "human ecosystem" logically closes precisely on the problem of urbanization and urban settlements. It is interesting that there are very frequent diametrically opposed statements not only by different authors, but also by the same author regarding the possibility of including cities in the rank of natural ecosystems [1].

Optimism in the views on the development of cities of the world-famous architect K. Doxiadis (who believed that the surface of the globe will eventually be covered by the territory of a "continuous city") has already been replaced by a more sober view of the American architect-urbanist W. L. Wright, who says: " Just as a tumor becomes malignant, the city, as a deadly entity, has become a threat to the future of humanity. Our great cities, these vampires, must die."

Despite this, anthropocentrism in solving the problems of urbanization not only did not cease to exist, but also intensified. Therefore, if the problems of modern urbanization can be solved, then only by taking maximum account of the actual ecological properties of cities.

The author believes that the assignment (or non-attribution) of cities to the rank of ecosystems is due to the incorrectness of traditional approaches and classifications regarding the spatial-temporal inconsistency of trophic levels in an artificially created human ecosystem. This thesis can be denied only if it is possible to separate the living and non-living nature once and for all. Since the main argument against the selection of a "city-ecosystem" is the fact of a significant predominance of man-made substances and energy over those produced in the biosphere, under the slogan of the impossibility of the existence of a "city-ecosystem" one can easily refute the theory of the biosphere-noosphere of V.I. Vernadskyi [3].

According to the well-known ecologist M. Golubets, "The term ecosystem or socio-ecosystem is not used to describe a city. An ecosystem is a living (biotic) unit in which... there is a constant material and energy cycle between living components and between them and the natural environment. For thousands of years, people's activities have been aimed at breaking out of this cycle. And they succeeded to a large extent: they learned to produce such a large number of unnatural synthetic materials that their decomposition (mineralization) cannot be ensured by the reductants of the biosphere. The planet is catastrophically polluted, its surface is covered with numerous necrotic spots" [1].

In fact, a person has not gone anywhere from this cycle. It simply expanded the boundaries of its ecological niche by outpacing natural processes in time (time traps) and spatial transformation of its ecotope (space traps). In addition, space-time transformation has significantly increased the degree of planetary entropy, which explains the modern information boom (traps for information) [4, 5].

In our opinion, urbanism is an advanced outpost of anthropocentrism and humanity's encroachment on the biosphere. And it is very difficult to disprove this statement, even with arguments about culture, civilization, and science, which are developing in cities. But, contrary to

the famous architect Le Corbusier's statement (1970), "Big cities are spiritual workshops where the best creations of the universe are created", the author believes that any city in its biosphere essence continues to remain an ecosystem.

Therefore, the urboecosystem is understood as a natural ecosystem in which, during the coevolutionary development of nature and society, social security functions related to the removal of inert matter beyond the organismal level of Homo Sapiens in the form of consumer values for use by the entire population have emerged and strengthened. At the same time, a purposeful fundamental structural change of the ecotope is mandatory. Ecological functions, such as participation in food chains of ecosystems, remained at the organismal level in the form of metabolism, but are provided not at the level of an ecotope, but at the level of an ecological niche, which today covers the entire biosphere of the planet [6].

It would be more expedient to divide all functions performed by cities into two large ontologically significant groups: social and ecological. In such a statement, the problem is posed for the first time, although such a statement is logical and emerges from the theoretical heritage of the classics of agrarian, biological and geographical science.

Thus, A.V. Chayanov's utopian efforts to deprive big cities of their social content are only gaining supporters today: "When the power was forever in the hands of the peasants, a decision was made to destroy cities with more than 20,000 inhabitants... Cities in the country remained as cities of meetings, celebration, that is, as a point, not a social being. In Moscow, hotels for 100,000 inhabitants have been built for 4 million places, in provincial cities for 10,000 inhabitants - hotels for 100,000, and these hotels are almost empty, since every peasant can spend an hour or an hour and a half in "his" city and it happens there quite often" [8].

At one time, V.V. Dokuchaev proposed to introduce the natural proportions of the distribution of steppe and forest areas, as well as the areas of water bodies, into the agricultural use of land. Such proportions were calculated for various natural zones and implemented almost throughout the territory of the former USSR. The continuation of these works is today's attempt to "inscribe" the boundaries of land use in the isoline of the relief in the direction of the development of the contour-ameliorative and contour-strip system of agriculture [Tararico, 2003]. Therefore, these works are aimed at strengthening ecological functions, in particular agricultural nature management.

Contrary to popular opinion among urban scientists, we consider the city to be a natural ecological niche, not an artificial one. The evolution of the formation of such an "ecological niche" has deep historical roots. The central point in this process is the formation of urban centers of early state associations. Such first capitals become centers of everything new that appears at this turning point in human history, focusing the contrasts and contradictions of the new age.

According to Yu. Pavlenko, such an early city can be imagined as "... a focal point, a node of all basic relations and contacts, on which the corresponding early civilizational social organism is supported as a self-organized material-energy-information system" [2].

Most likely, this is a stage (epoch) in which the vast majority of agroecosystems formed at that time "spurred" urboecosystems, which had new informational qualities. At the same time, the mechanism and logic of such an "eruption" are preserved throughout all historical eras. But in later times (colonization of America, Australia), spatial proportions between predominantly autotrophic and heterotrophic territories brought by colonizers from Europe became the basis for the separation of cities.

All this determines the character of the city as a separate, relatively autonomous ecological system, which is based on the interaction of the social organism as a whole with the environment, which undergoes transformations on its part.

The general conclusions of our study include the following:

- Agroecosystems - urboecosystems - two separate, but successive branches of civilizational (noosphere) development. The second gradually emerges from the first upon reaching a certain level of material-energy-informational compaction of geospace.

- The form of such compaction in agroecosystems is the appearance (and subsequent realization) of surplus product (transported far beyond their borders) due to either the unique natural fertility of the soils (Nile, Mezhyrchya), or the use of irrigation and melioration (at the current stage - the use of selection and mineral fertilizers), or the entry of agroecosystems into the

hinterland of a city (then the organization of fodder arable land is necessarily a derivative), since the presence of a hinterland (in the modern concept of a suburban zone) implies a compaction of geospace.

- The main ecological feature of urboecosystems is the emergence and further development of industries that produce information (previously – various services and paper information; now – virtual).

- The efforts of most historians and philosophers to look for evidence of the civilizational unity of humanity in large cities and urbanization is groundless and methodologically wrong - "world cities" today only deepen the differences between "civilized" and "traditional" societies, dividing the geographical space in their favor.

- The artificial separation of urban ecosystems from natural ecosystems is methodologically wrong and is explained precisely by the dilution in time of the state of the beginning of the formation of urban ecosystems and their current state.

- The ecological tolerance of modern urboecosystems will be greater, the more multiple ecological (rather than social) functions they perform.

- In order to fulfill the last condition, humanity must in the near future radically change its spatial existence, in particular, form such communities that would be harmoniously inscribed in natural ecosystems primarily by the type of substance-energy relations (natural economy).

It is established that the advantages of urbanization are realized only in conditions of peaceful life. In the case of hostilities, they turn into a real threat, which the residents of most Ukrainian cities have felt today. Multi-storied buildings, enormous amounts of water, electricity and coolants circulating in powerful transport and infrastructure facilities, in the event of their functioning being stopped due to destruction, cause a number of catastrophic consequences. Unfortunately, we will not be able to get rid of the belligerent northern neighbor, no matter how much we want it. This is confirmed by the previous centuries-old history, during which periodic captures of our territory took place. Therefore, it is necessary to look for such solutions that would be able to minimize the damage from future rocket attacks.

In our opinion, the real post-war way to solve this problem is gradual deurbanization with an even distribution of all important elements of the technical, energy, and transport infrastructure [7].

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