

# BIOSPHERE COMPATIBILITY: HUMAN, REGION, TECHNOLOGIES

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D.A. ILICHEVA

## **THE CONFLICT OF CULTURAL-HISTORICAL LANDSCAPE OF THE SEVASTOPOL CITY AND ITS MODERN REALITIES**

*The Cultural-historical landscape and competent attitude to its architecture and construction is directly reflected in the comfort of use and device of each city. The incorrect correlation and use of the potential of the cultural-historical landscape and development of territories leads to the formation of "conflicts" within the urban system, which leads to discomfort in the use of the city, both for the locals and the tourists. The cultural-historical landscape must be an integral part in the design, the city and its buildings, the population must constantly interact with it, increasing its potential, and identifying new and significant details, complementing the specificity of the cultural-historical landscape, turning it into an undeniable advantage and attraction of the city. It is necessary to formulate a universal "model" of a multifunctional object that takes into account and emphasizes all the features and identity of the city, meets the basic requirements of both residents and visitors to the city and, first of all, solves the acute problem of shortage of modern and affordable housing for the vast majority of cities. The article details the concept of cultural-historical landscape and the concept of the city, considers the "way of life" and the functioning of the city as a living organism. Also, the article deals in detail with the components of the cultural and historical landscape of the city of Sevastopol, followed by the identification of the most pressing "conflicts" between the identity, creating an extraordinary attractiveness of the city, and the reality of the city, hindering its full-fledged and organic development.*

**Key words:** *cultural-historical landscape, conflict, city, identity, comfortable urban environment, Sevastopol, buildings, development, marine facade.*

G.E. ARTAMONOV, V.A. GUTNIKOV

## **PRINCIPLES OF ENERGY OBJECTS IMPACT OPTIMIZATION ON ECOSYSTEMS**

*Environmental safety of energy facilities in the Russian Federation is an important issue of energy system functioning. Optimization of the energy objects's anthropogenic impact on ecosystems is considered today as an important component of spatial planning, along with economic issues such as reducing energy costs for electricity generation, reducing losses in the transportation of industry products, etc. Documents of territorial planning in the field of energy envisage the construction of new power plants and an increase in the capacity of existing ones. In addition, the forecasted values of the energy strategy of the Russian Federation for the period until 2030 provide for a significant increase in the production of oil, gas, coal, and electricity, which, without the environmental measures, will increase the anthropogenic pressure on nearby ecosystems that have different properties and capacity. The vector of world energy development shifts towards minimizing the impact of technical and technological processes on all types of power plants, as well as improving the mechanisms for the production and distribution of electricity from the power plant through electric grids to consumers. Russia's access to a high level of human well-being against the background of increased global competition and the exhaustion of sources of mineral and raw materials and natural resources requires increasing the efficiency of the use of all types of resources and ecosystems for the development of society.*

**Key words:** *ecological safety, power engineering, subjects of the Russian Federation, electric power, modeling, physical geography, ecosystems, TPP, HPP, NPP, SPP, WPP, GPP, TPP.*

T.N. KOLESNIKOVA, E.S. NOVITSKAYA

## **THE CONCEPT OF THE ARCHITECTURAL AND URBAN ORGANIZATION OF THE NETWORK OF EDUCATIONAL INSTITUTIONS IN CONDITIONS OF SETTLEMENT OF INDIVIDUAL DEVELOPMENT BASED ON THE PARADIGM OF BIOSPHERE-COMPATIBILITY**

*In connection with the active growth of cities, and consequently, a sharp deterioration in the ecological situation, the creation of an unfavorable visual and emotional climate for each individual individually, and for society as a whole, it became necessary to revise the existing concepts and principles of environmental formation from the point of view of architectural and town-planning science. Recently, in the sphere of housing construction, the tendency of active growth of settlements of individual development is traced, which is directly related to the positive demographic policy conducted in the Russian Federation, and the desire of a person to have at his disposal a personal space for a full psychological rest. But unfortunately, for the most part, already implemented projects of building planning do not meet the requirements of comfort, in the understanding of modern man, from the point of view of fulfilling the functions of the social plan of the primary level of human service (one of the most important objects of social infrastructure is educational institutions: kindergartens and schools), which, in turn, creates significant inconveniences for the inhabitants of such settlements. The erection of this type of objects, most often, does not plan or refers to the second or subsequent construction queues. Based on the analysis of general plans for settlements of individual development, the authors have identified rational types of educational institutions from the point of view of the correspondence of the biosphere compatibility paradigm. The typological characteristics of individual settlement settlements were identified, based on the diversity of architectural and town-planning parameters of the existing cottage development for a number of significant indicators. The basic factors were: the specifics of the current socio-economic situation, the limited areas allocated for infrastructural facilities in the design decisions, the need of the society in providing the entire range of basic functions that characterize the cottage community as a developing person. Based on the study carried out by the authors, the concept of improving the structure of general plans for cottage settlements of various capacities was developed, and a rational typological series of educational institutions was proposed.*

**Key words:** kindergarten, school, educational institutions, suburban settlement, radius of accessibility, intensification of residential environment, network principle of location of educational facilities.

E.L. BUDARIN, K.V. LITVINENKO

## **PECULIARITIES OF APPLICATION OF SOLAR BATTERIES IN MODERN ARCHITECTURE OF AVAILABLE LOW-STORAGE HOUSING**

*The main purpose of this article is to identify key aspects of the use of alternative energy sources. Various devices that make it possible to convert solar radiation into thermal and electrical energy are the object of research into solar energy, the science of studying solar energy and its application in various fields. The production of photovoltaic cells and solar collectors develops in different directions. Solar batteries come in various sizes: from embedded in micro calculators to roof-topping cars and buildings. The advantages and disadvantages of solar batteries and their analogues available in everyday life were considered most widely. Also, narrowly focused options for the use of solar energy resources were considered, in particular the example of the most affordable type of low-rise housing, taking into account all possible consumers, the types of equipment applicable for such a system, materials from which a building or structure can be erected, as well as features and performance characteristics solar cells themselves. The idea of using alternative energy is by no means new, because the resources on our planet are not eternal and are depleted every day, the population growth is inevitable, and hence the consumption of non-renewable natural resources is also growing. The most interesting and low-cost source of alternative energy is considered solar, so you need to carefully study the possibility of using solar panels in architecture. Based on the above reasoning, conclusions were drawn about the relevance of solar batteries in our country and in the world as a whole, as well as the reasons that can contribute to or, on the contrary, prevent the formation of solar and other types of alternative energy in the world market as the main type of energy that can gradually displace those energy sources that are leading at the moment.*

**Key words:** architecture, alternative energy sources, solar batteries, solar energy, saving of natural resources, environmental protection, energy efficiency, renewable energy sources.

O.A. SOTNIKOVA, E.A.ZHIDKO

## **THE CONCEPT OF ORGANIZATION OF ENVIRONMENTAL MONITORING AND DIAGNOSTICS OF HEAT-ENERGY OBJECTS TO INCREASE THE RELIABILITY OF THEIR OPERATION**

*At the present stage, the problem of ensuring environmental safety, both on a planetary scale and at the regional level, has become particularly acute. It is about the rational use of natural resources and environmental protection in the process of human economic activity.*

*In connection with the fact that the issue of environmental safety of regions and cities is acute, it is important to diagnose and assess the state of the economic entity and the environment. To ensure effective economic development and economic security of the regions, it is important to monitor the state of enterprises in various sectors of the economy, including monitoring industrial safety of hazardous production facilities.*

*According to the "Environmental Doctrine of the Russian Federation," the main task in the areas of environmental monitoring and information support is to provide state and municipal bodies, legal entities and citizens with reliable information about the state of the environment and its possible adverse changes. For the safe and sustainable (anti-crisis) development of economic entities in the new conditions of the 21st century, it is necessary to provide decision-makers with timely information on the state of the external and internal environment, both the object and the natural environment, in order to make timely and competent decisions.*

*At present, thermal power companies are experiencing significant difficulties in ensuring trouble-free and safe operation. Heat power plants related to hazardous production facilities are known to have a significant negative impact on the state of all elements of the environment. Therefore, the issues of trouble-free and safe operation of CHP plants are becoming increasingly important due to the high degree of wear of the main equipment and the risks of accidents and failures. Diagnosis is an essential part of environmental control.*

*The article deals with the problems of the CHP operation, the model of the monitoring system of the economic entity is presented on the example of the CHP and its functioning in the context of daily operations.*

**Key words:** *ecological monitoring, environment, diagnostics, technogenic system, thermal power plan*

M. M. SANGADZHIEV, V. V. SERATIROVA, L. I. KHOKHLOVA,  
A. N. BADRUDINOVA, O. V. ERDNIEV

## **ENVIRONMENTAL ASSESSMENT OF LANDSCAPES IN KALMIKIA**

*The article analyzes the current state of landscapes on the territory of the Caspian lowland, in particular the Kalmyk part of it. Many people are engaged in studying the change in landscapes, climate, and tectonics. The landscapes of Kalmykia are almost not studied, there are separate articles and speeches. In connection with this, we set the task of studying the present state of the landscape in Kalmykia and its relationship with historical geography, geology and the history of nationalities living in different years on the territory of the Caspian Sea. The intensive development of industry, agriculture and the unfavorable attitude to the rational use of subsurface resources led to the process of desertification, reaching at the present stage catastrophic parameters. Geological and geographic characteristics of the investigated region are considered: tectonics and stratigraphy, the influence of relief, meandering processes, wells and springs, river and lake shorelines, reservoirs and canals, tailings, origin of desertification foci, climate. The work uses the data of the conducted expedition routes for recent years, the results of reports of state departmental bodies working in the field of ecology and the use of subsoil in the study area. Stock materials of geological organizations and the work of employees, students of the engineering and technological faculty of the Kalmyk State University were also used in the article. According to the results of the study, the current state of the landscape in Kalmykia, their impact on surface and groundwater, oil and gas production is determined. A model for changing the landscape is suggested in the event that environmental protection measures are not implemented in the coming years. This is a shortage of water, its high mineralization, salinization and development of arid areas both east of Kalmykia, and in the central and western areas of the research area. Changes in the development of flora, fauna, the process of desertification and the health of the population of the republic. The obtained data can be used for adoption of budget economic programs and development of the Republic of Kalmykia in the future. The work can be used by students, researchers and all those who are not indifferent to the current state of our house, the environment.*

**Key words:** *tailings; Ergeninskaya Upland; meandering; underground and surface waters; flooding; tectonics.*

E.A. GORYUNOVA

## **MONITORING OF INDUSTRIAL SOILS' POLLUTION OF URBAN SETTLEMENTS (AS A FACTOR OF BIOSPHERE INFLUENCE) DUE TO ANTHROPOGENIC IMPACT OF TOXIC EMISSIONS**

*The industrial lands of urban settlements are subject to intensive influence from the exhaust gases of internal combustion engines used in road transport, emissions of industrial enterprises, construction industries, in the process of operation of boiler units, hydraulic fracturing units. As a result, pollution occurs with oxides and carbon dioxide, nitrogen oxides, hydrocarbons, aldehydes, soot, benzopyrene, heavy metals. On the example of the city of Bryansk, as an industrial center, an assessment of the state of the urban soil environment was made and risks of biospheric pollution were identified. The hypothesis of anthropogenic impact is based on the idea that there is a chemical destruction of the urban environment, which is unconditionally confirmed by experimental data and theoretical generalizations. The work analyzes the exhaust emissions of vehicles and industrial facilities, determines their concentration, depending on the distance from the source of emissions, propagation in layers of industrial soils, depending on the depth. The author developed a method for taking soil samples of industrial purpose, establishing the frequency and depth of sampling, the materials and means used, the dispersion of emissions, the location of sampling points depending on the presence and absence of forest belts, the metals sampled. The main criterion for assessing the degree of soil pollution in urban settlements is the maximum permissible quantities (MPC) and the target permissible amounts (ODC) of chemicals in the soil, according to GOST 17.4.1.03-84. The formulas for determining the concentration coefficient of soil contamination are given. Complex impact on the problem posed in the article and application of a sound methodology for biospheric pollution monitoring allows minimizing damage to the urban environment and preserving industrial lands, city parks and squares.*

**Key words:** *ecological object, biosphere, industrial lands, exhaust gases, check-out technique, heavy metals' concentrations, sampling of soil specimens of urban settlements*

L.A. VASILENKO, H.G. ZHUKOVA, V.V. SAMUSENKO

## **ANALYSIS OF WATER QUALITY FOR CENTRALISED WATER SUPPLY OF KIEV (UKRAINE)**

*The anthropogenic impact on aquatic ecosystems in the modern period the outstanding relationship between human society and the natural environment causing environmental problems. The most acute problem associated with the qualitative and quantitative depletion of drinking water sources for centralized water supply of the population. Today, with the rationing of drinking water quality is not fully taken into account the current state of the surface sources of drinking water, water quality which gradually deteriorate, despite the decline in industrial and agricultural production. This outdated drinking water treatment technologies at waterworks taken in the 50-ies of the last century, is not perfected and do not provide the clearing of natural water to the increased requirements for drinking water quality.*

*Today is very urgent task is to analyze the supply and quality of drinking water in Ukraine, development of new regulations, the improvement of the existing water treatment technologies, bringing them closer to the standards of European countries. We have the example of Kiev held a prior analysis of the use of water quality for the centralized water supply. The paper presents a synthesis of the actual hydrological information on surface water sources over a five year period (Kiev reservoir and p. Gums), data on the qualitative assessment of surface water (ecological index, the index of water pollution), established causal relationships ecological imbalance, the main sources of pollution and polluting substances, the analysis of the dynamics of water pollution, as well as the characteristics and volumes of pollutant discharge of the Dnieper and Desna water supply station*

**Key words:** *Qualitative depletion, quantitative depletion, environment, natural resource management, index of water pollution, environmental index.*

A.V. ZVIAGINTSEVA

## **RISK ASSESSMENT OF HAZARDOUS EVENTS IN THE STATE AND URBAN DEVELOPMENT ANALYSIS**

*Reflected the existing approaches to risk assessment at the environmental pollution, established in environmental and socio-hygienic monitoring. It is shown that the assessment of hazardous events associated with pollution and its consequences can be based on the joint events risks determination. When constructing risk functions scientists evaluate the such events probabilities and establish their connections with negative consequences (more complex events): effects, morbidity, mortality associated with air, water, soil, etc. pollution. Based on the general approach to hazardous events risk assessment, the systematization and classification of similar events observed in environmental and socio-hygienic monitoring was carried out. It is shown that the state (risk) probability can be characterized by several related causal events. The following events are distinguished: simple observation events of each of the indicators characterizing the environment pollution; joint events of simultaneous observation of several environmental pollution indicators; complex events of recording negative effects and consequences caused by exposure to a bioobject while observing a single environmental pollution indicator; complex events of registration of negative effects and consequences caused by exposure to a bioobject while simultaneously observing several environmental pollution indicators. For the indicated events, the calculation formulas for the probability of their realization are justified and given. It proposed the comprehensive assessment of environmental quality in industrial-urban agglomerations and the events negative impacts risk analysis on the population be based on a probabilistic approach data modeling, monitoring the subjects received. It designed the dangerous events risk determining phenomenological method, taking into account the different cause-and-effect relationships. For large Russian cities obtained the regression relationship between the probabilities of significant air pollution events and concentrations of dust and nitrogen dioxide. Assess the chronic effects risk on the population on the dependent events complex determining basis. The air pollution chronic effect danger ranking of Russian cities is done.*

**Key words:** *ecological safety of cities, hazardous events and risk of contamination of the environment, risk assessment techniques.*

V.V. TSYGANKOV, M.N. YURKOVA

## **THE CHARACTERISTICS OF THE DOMINANT INTERNAL NOISE**

*Intraquarterly space is filled with a large number of sources of noise pollution. Noisy youth, children on the playgrounds, intradomestic power plants, service enterprises located inside the yards. The dominant here is without any doubt the penetrating noise of urban transport.*

*The article gives an analysis of disturbing noises inside neighborhoods of a residential area. These types of noise are classified, conditions for conducting experiments are described, and a brief description of the measuring recording path and acoustic equipment as a whole is given. Analysis of the selected measurement site is given. The method of measurements and measurement techniques is substantiated.*

*The purpose of the measurements is to study the interference pattern in the rectilinear propagation of penetrating transport noise, depending on its frequency composition and distance from the source, with the penetration of traffic noise into the quarterly space.*

*During the study, it was necessary to determine the points of decline and rise of sound pressure levels in the vertical plane.*

*For this purpose, the vertical distribution of the points of interference lifts and drops in sound pressure levels in octave bands was recorded. In each octave band, three measurements were made at each measuring point. The measurements were carried out in the summer, while the meteorological conditions were always the same. Penetrating into the intraquartal space, transport noise spreads over the sound-reflecting surface rectilinearly and, basically, unimpeded.*

*The obtained results can be used in the development of measures to protect the noise of intra-yard spaces.*

**Key words:** *dominant noise, yard space, acoustic instrumentation and measurement, an interference pattern.*

A.D. SEROV

## MODELING OF HARMFUL PROCESSES (DAMP AND EFFLORESCENCE) OF THE UNDERGROUND PART OF BUILDING

*This article solves the problem of damp and efflorescence effects on structures in the underground part of building. Damp is considered as a process leading to structures destruction and deterioration of building materials properties. The article presents a methodology and the results of experiment of the determining relationship between the material moisture and its thermal conductivity. There is a correlation between the consequences of the capillary rise of moisture from the ground (on the walls of the underground part of the building), the increase in heat losses during the cold and hot seasons. The article focuses attention on the fact that ground moisture is the source of water-soluble salts entering the material. Efflorescence is considered as a factor that accelerates destructive processes and changes the thermal properties of materials. Salt increases the sorption of building materials, so that even with its complete drainage, a significant part of the moisture can return by absorbing it from the air. It is noted that the design will remain wet until it is desalted, describes the physical and chemical processes that occur during desalination. Present methods of desalting stone structures and using the desalting method in the field of a constant electric current. The article describes the method of salinization of samples and the experimental installation of electroosmotic desalination of stone. Particular attention is paid to the washing of the near-electrode zones to remove salts and the products of chemical reactions, inevitably produced during demineralization. Two methods for determining the salt content in desalted samples are compared. Conclusions are made about the efficiency of electroosmotic desalination and the direct connection of measures for dehumidification and desalination of structures with resource-saving.*

**Keywords:** dampness of underground part of building, capillary rise of moisture, desalting of stone, electroosmotic desalting, damp, experiment.

P. Yu. VOVZHENYAK

## THE FACTOR OF COLOR IN THE ARCHITECTURAL ENVIRONMENT OF THE CITY OF BELGOROD

*All around us in the natural or urban landscape in a particular color. Color is an inevitable attribute of the subject-spatial environment. Nature created man ordinarily considers the harmonious natural colors, color combinations and belonging to certain forms, constancy and cyclical variability. The lack of color contact with its natural surroundings, disregard the color experience of the past and the inability to use polychrome to promote the socio-spatial processes in the city, give rise to dissatisfaction with the color atmosphere of most of our cities. In conditions of intensification of use and increased versatility of urban space value color environment for residents has increased substantially. Belgorod is unique in its colour form. Forming in time for a certain period, it has a distinctive color palette, depending on the objective, subjective, social, economic and cultural-aesthetic factors.*

*The color of the urban environment shapes the understanding of its spatial expression, aesthetic and spiritual content, it can be conventionally separated from the urban environment and speak about the color environment of the city. At the same time coloring a color is thought of as the environment or polychrome forming objects which satisfy human aesthetic and utilitarian in contrast to spontaneously occurring color of the environment. In any city there are processes that do not depend on the desires of its inhabitants. The seasons are changing, alternating day and night, sun and rain, blooms, yellow fall foliage. All this forms a set of objective factors of their color manifestations anyway affect mood and human activities. In world practice there have been different approaches to the formation of color city, which are based on the polychromy of its natural environment, historical architectural colours and preference of the residents. A color process has certain phases, each of which is caused by the dominance of a particular factor [5].*

**Key words:** coloring, color, architectural environment, color, culture, polychrome, Belgorod.