



SCIENTIFIC RESEARCH OF THE SCO COUNTRIES: SYNERGY AND INTEGRATION

上合组织国家的科学研究：协同和一体化

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这些会议文结合了会议的材料 – 研究论文和科学工作者的论文报告。它考察了职业化人格的技术和社会学问题。一些文章涉及人格职业化研究问题的理论和方法论方法和原则。

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建筑业线性经济体系的危机。 向基于闭环经济的可持续原则过渡。 以钢结构为例，探讨俄罗斯建筑中应用可持续方法的可能性 Crisis of the linear economic system in the construction sector. Transition to sustainable principles based on closed cycle economy. Possibilities of application of sustainable methods in construction for Russia on the example of steel constrictions	
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制裁限制和俄罗斯新经济政策的理论方面
**THEORETICAL ASPECTS OF SANCTIONS RESTRICTIONS AND
RUSSIA'S NEW ECONOMIC POLICY**

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注解。 作者研究了制裁对俄罗斯经济影响的理论方面。 本文的目的是在决定经济抵抗制裁能力的因素以及使现代国家经济发展复杂化的情况下，理解制裁压力作为影响俄罗斯国民经济的工具。 政治和经济条件。 文章审视了制裁下俄罗斯经济的发展前景，并判断了经济承受制裁压力的能力条件。

关键词：制裁、资源、技术、政治、经济、模式。

Annotation. *The authors examine the theoretical aspects of the impact of sanctions on the Russian economy. The purpose of the article is to understand sanctions pressure as a tool of influence on the Russian national economy in the context of those factors that will determine the economy's ability to resist sanctions, as well as those circumstances that will complicate the country's economic development in modern political and economic conditions. The article examines the prospects for the development of the Russian economy under sanctions, and determines the conditions for the economy's ability to withstand sanctions pressure.*

Keywords: *sanctions, resources, technologies, politics, economics, model.*

Mainly the sanctions pressure determines the current global political and economic situation that has developed around Russia that Western countries are putting on our country, trying to force it to change its political course.

This tool for solving political problems using economic levers is not new and was actively used by Western countries in relation to their political opponents in the post-war period, and it is still used today.

In the theoretical and practical aspect, the issue of sanctions pressure relates to the problem of familiarity of political and economic processes. If at the end of the 19th – beginning of the 20th centuries economic interests dominated over political interests, now the situation has changed and modern leaders of world development are ready to endure economic losses, guided by political considerations.

In this context, it should be said that the current situation has a completely objective basis, since issues of political sovereignty currently determine the possibility of the existence of states and peoples in conditions of economic sovereignty, guaranteeing economic independence, the right to dispose of national wealth, as well as the social well-being of citizens.

In this sense, modern global political and economic processes are a clear illustration of the priority of politics over economics, which creates a new background for the development of political economy, which has traditionally been based on issues of political management of national economies in the context of the development of world trade [10].

Currently, this approach appears to be partially losing its relevance, since the modern world economy is developing under the influence of factors of constant economic confrontation, when local trade wars are being replaced by economic policy technologies, the purpose of which is to ensure global economic dominance of one, very limited, group of countries in the global economic system.

According to foreign researchers, the goal of such dominance is to create a new economic order, which, in conditions of increasing resource shortages, will provide Western countries with further economic prosperity by maintaining conditions of inequality in the areas of digitalization, information exchange, technological development and political power, supported by military force, financial and industrial potential and unlimited access to the resources of other states that deny fair exchange of goods [11].

Thus, the purpose of this article is to understand sanctions pressure as a tool of influence on the national economy of Russia in the context of those factors that will determine the ability of the economy to resist sanctions, as well as those circumstances that will complicate the economic development of the country in modern political and economic conditions: to consider the prospects for the development of the Russian economy, as well as propose a new model of economic development that can withstand sanctions pressure.

Economic theory has a very ambiguous attitude towards sanctions; there are works by authors that indicate that sanctions are a very limited mechanism for influencing political consciousness and political decisions, since, ultimately, the

state and population adapt to life under sanctions and develop very successfully . In particular, these authors turn to the experience of the USSR, whose economy existed for a long time under sanctions and demonstrated economic stability until the moment when “political sabotage” caused the collapse of the USSR and further economic collapse [14].

However, there is an opinion that sanctions have devastating consequences for national economies that have come under their influence and can lead to the destruction of the economic system, which loses the ability to exist without the presence of a serious “sponsor state” that is a partner of the country that has come under sanctions. In this case, as a rule, researchers turn to the example of Northern Korea [13].

Russian economists also assess the impact of sanctions ambiguously; however, in modern economic literature [1, 6, 7] the dominant opinion is that sanctions cannot significantly affect the state of the Russian economy.

Let us consider this problem in more detail, based on objective grounds that arise from the content of economic sanctions, as well as from the situation that determines the conditions for the economic development of our country under sanctions.

We include these conditions:

- the desire of Western countries to slow down (impede) the economic growth of Russia;
- the presence of serious industrial and resource potential, which allows the autonomous production of many samples of industrial products and services;
- reliance on an export-oriented economic growth model based on hydrocarbon trade;
- shortage of labor resources, which does not allow solving issues of economic growth through their extensive use;
- technological lag and the need to modernize industrial production by updating fixed assets.

From a theoretical point of view, sanctions do not affect the entire economy at the same time, but, first, the industrial, financial and consumer sectors, which are focused on import activities. In other words, sanctions limit the influx of credit funds, foreign investment and imported goods and services that previously entered the country without hindrance and have become a common resource element of economic development.

At the same time, there are compensation mechanisms that allow you to “bypass sanctions” and mitigate their impact. In particular, we are talking about the development of shadow trade, increasing trade exchanges with countries that have not joined the sanctions, and the possibilities of increasing our own economic

capabilities that can replace the sanctions deficit. At the same time, there is not a single country in the world that has been able to completely overcome the consequences of sanctions [12].

Currently, it is believed that the most successful country in terms of counteracting sanctions is Iran, however, even in this country, according to experts, the rate of economic growth (in the absence of objective statistics) is maintained exclusively due to shadow schemes and non-market forms of economic regulation, reducing the rate of economic growth, resulting in a loss of 3 trillion in the 40 years since the introduction of the first sanctions (starting in 1979) \$900 billion USA, which is equal to the volume of three annual GDP according to data for 2020 [15].

This situation is explained by the fact that sanctions measures form a kind of “closed cycle of sanctions impact”, because of the objective existence of which sanctions indirectly affect the entire economic system (Fig. 1).

As can be seen from the above diagram, the use of classical anti-sanctions policy, which in the Russian interpretation implies a focus on import substitution, is not able to solve the problem of sanctions due to the fact that the policy of import substitution may become relevant at the stage of production activity, when resource-supplied production is capable of producing a product (service), which was previously included in the list of sanctions restrictions and its absence had an impact on the state of the national economy.

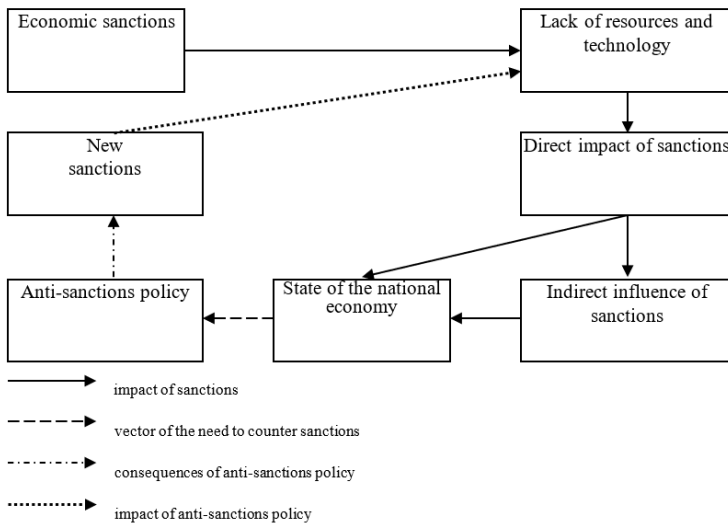


Figure 1. Closed cycle of sanctions impact on the national economy (proposed by the author).

At the same time (and this is demonstrated by the above diagram), the impact of sanctions is most acutely felt in industries in which resource shortages may arise due to technological limitations that are formed due to sanctions.

In Russian economic science, there is an opinion that the Russian economy can develop relatively autonomously, since the country has a huge resource base. However, this belief conflicts with the factor of technological support for resource extraction. Already today, experts say that more than 50% of equipment in the oil and gas industry needs urgent replacement, since its constant failures reduce not only the efficiency of production, but also its volumetric indicators. A similar situation occurs in the field of mining, gold mining, etc. [3].

Accordingly, in the next 5-10 years, Russia may face a paradoxical situation when, against the backdrop of an excess volume of national resources, their extraction will be very difficult, which will lead to resource shortages and, accordingly, to the fact that sanctions will ultimately have a devastating impact on Russian economy. In this regard, strategic documents note the critical dependence of organizations in the fuel and energy complex on the import of technologies, equipment, materials, services and software in a number of the most promising areas of energy development [9].

In this regard, economic theory recommends, along with the policy of import substitution, which is a secondary instrument of anti-sanctions policy, to develop actively a policy of technological renewal of the technological base of resource-providing industries [10].

In this context, attention should be paid to one aspect that is more important. Currently, in the economic consciousness of the majority of Russians, including those responsible for economic development, there is a belief that reliance on the technological power of China, Indian technologies, and the production base of North Korea can fill the resource technological deficit and provide the national economy with relatively prosperous future.

However, in this case, we again fall into the “sanctions trap,” bearing in mind that any economic cooperation is always opportunistic and economic feasibility does not always determine the content and volume of economic cooperation between countries. As the beginning of the 21st century shows, the political component determines the current state of economic relations and influences the most important economic decisions.

In this regard, relying in strategic planning for the development of the national economy only on the “political favor” of today’s partners is a very dubious basis for economic growth, requiring fundamental correction.

We should also not forget that the sanctions policy involves not only limiting the supply of resources, goods, services, financial and investment interaction, but also limiting export activities. Russia faced such a problem, given the refusal of Western countries to supply Russian hydrocarbons.

A solution to this problem was also found and significant volumes of hydrocarbon sales were reoriented to China and India. This situation further strengthens Russia's dependence on the future political course of these states, which may change depending on the political situation and political interests of these states. In this regard, there is an urgent need to formulate a fundamentally new national export policy, energy policy and resource support for the country's economic development.

In this case, it is necessary to accept the theory of the "curse of resources", which is based on the fact that a country's resource wealth is not always a blessing, since the ability to ensure economic growth through the export of resources inhibits the development of other industries and reduces the overall efficiency of industrial production [4]. The meaning of this theoretical concept is quite consistent with the current state of the Russian economic model, in which the export of resources is considered as the dominant element of national economic policy.

The above allows us to say that the belief in the inability of Western sanctions to influence the development of the national economy is a very dangerous delusion that does not make it possible to correctly formulate strategic priorities for economic development.

In this regard, it should be recognized that the impact of sanctions on the Russian economy will have a certain effect due to the objective nature of resource limitations that will one way or another arise in connection with the technological problems of the national economy. Similarly, today it is difficult to predict the state of Russian foreign trade even in the short term (next 3 years - 5 years).

In this regard, at present, a strategic decision for Russia is to create a "closed cycle" economy following the example of the USSR economy, which, despite all its limitations, still provided the population with a decent standard of living, solved issues of industrial development and the development of industries related to the country's defense capability.

The theorists of this concept were Soviet economists, in particular N.A. Voznesensky, who substantiated the possibility of relatively autonomous development of the state's economy in the presence of resource potential, human resources, scientific, educational and design base [2]. The value of this author's research lies in the fact that the scientist made his conclusions during the difficult war period of the development of the USSR economy.

At the center of the idea of a "closed economy" is the postulate that the resource capabilities of the state determine the prospects for economic growth through the creation of resource-intensive industries capable of absorbing a significant share of extracted resources, provided that national industry, education and science are able to create technologies, embodying them in real industrial designs capable of transforming available resources into finished products necessary for the development of the country.

Of course, the Soviet economic model was subject to justified criticism, which mainly boiled down to the fact that the lack of private initiative was not able to create incentives for growth in productivity and production efficiency. Without going into discussions on this matter, we note that currently in Russia there is a mixed economy, which functions quite effectively in China, which was able to combine the interests of private business and the state, increasing its own economic potential to the level of an economic superpower.

At the same time, it should be noted that initially the development of the national Chinese economic model was based on the Soviet economic doctrine, which China was able to quite adequately transform into a model of a “planned market economy”, which fully meets the interests of the state and nation.

The works of Russian scientists have spoken many times about the need to use Chinese experience in the development of the Russian economy [5, 8].

However, this did not take into account the real circumstances that do not allow Russia to simply borrow the Chinese experience. A distinctive feature of the Chinese economic model (for all its organizational and institutional perfection) is its reliance on a virtually unlimited amount of human resources. In our economic literature, this factor is rarely taken into account, although analytical articles provide data that if in the USA the labor of 1.4 million workers is used for 1% of GDP creation, in the EU - 1.2 million workers; in Japan there are 980 thousand workers, then in China to create 1% of GDP it is necessary to use the labor of 26 million workers [12].

Accordingly, for Russia, given the shortage of labor resources, it is impossible to use fully the Chinese experience and there is an urgent need to find its own ways of anti-sanctions struggle.

How appears to the authors of this article, at present, for Russia, the optimal Soviet experience is the mobilization of economic resources to create an economic base that is capable of functioning and providing social-economic growth in the context of external economic and political restrictions.

To create such an economic model, it is necessary, first, to solve the problems of technological support for the extractive industries, which should become the “nutritive basis” of economic growth. Solving this problem requires an active investment policy in the field of education and R&D, the creation of institutional and legal conditions for the rapid implementation of the results obtained, when education and science work in close conjunction with industry. In this regard, the need for the development of microelectronics products and digitalization products, which should also be recognized as an integral part of the resource supply of production and a condition for its effectiveness, comes to the fore.

Also, at present, it is absolutely necessary to create conditions for the development in Russia of its own highly efficient oil refining and petrochemical industry,

establishing the production of other energy-intensive and resource-intensive industries, such as the production of building materials, the production of chemical products, the production of fertilizers, etc.

The solution to this strategic task, of course, requires financial support, which should be based on trade in finished products, provided that foreign trade in energy resources should be considered as a secondary sector of trading activity, operating “on the remnants of resources” that were not in demand by the national industry.

These efforts should be supported by economic diplomacy, the development of bilateral economic ties with countries that do not support economic sanctions against Russia, given that currently the countries of Latin America, Asia and the Middle East may well become Russia’s partners in trade exchanges.

These strategic directions, it seems, may well create conditions for the policy of creating a “closed cycle” economy to replace the policy of import substitution, which has limited potential in solving problems associated with sanctions, which in the current economic and political conditions should become strategic guideline for Russia’s economic development in the medium term.

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发展木屋建设激活国内木材产品需求

**ACTIVATION OF DOMESTIC DEMAND FOR TIMBER PRODUCTS
THROUGH THE DEVELOPMENT OF WOODEN HOUSE
CONSTRUCTION**

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the Komi Republic*

抽象的。木屋建筑正在成为国内木材工业产品国内需求发展最有前途的领域之一，因为它可以解决该国居民建造个人和多公寓住房的许多问题，包括移民、社会设施建设等。木屋建设的发展可以成为整个木工行业发展的强大动力。目前，林区当局在联邦当局的支持下，正在制定木结构住房建设发展的战略方向。

关键词：框架木结构房屋建筑；国内木材需求；木材加工业；木屋套件制造商；型材建造的房屋；由圆形原木建造的房屋。

Abstract. *wooden house construction is becoming one of the most promising areas for the development of domestic demand for the products of the domestic timber industry, since it allows solving a number of problems in the construction of individual and multi-apartment housing for the country's residents, including for immigrants, construction of social facilities, etc. The development of wooden housing construction can become a powerful incentive for the development of the entire woodworking industry. Currently, the authorities of forest regions, with the support of federal authorities, are developing strategic directions for the development of wooden housing construction.*

Keywords: *frame wooden house construction; domestic demand for wood; timber processing industry; manufacturers of wooden house kits; houses made of profiled timber; houses made of rounded logs.*

The task of developing wooden house construction is not a new issue and, in light of such increased attention from the federal authorities, is quite promising both for the country as a whole and for our forest republic.

In recent years, forest regions have taken the problem of increasing the volume of deep processing and expanding the range of final wood products quite seriously due to the current objective situation, provoked not only by the pandemic, but also by various sanctions, including against the Russian timber processing industry. Federation Council Committee on Federal Structure, Regional Policy, Local Government and Northern Affairs November 2, 2023 a round table was held on the topic “Prospects for the development of wooden housing construction in the Russian Federation.” Based on the results, it was noted that wooden house construction has great potential and will make it possible to tap into significant reserves of domestic demand for wood [1].

By 2030, it is planned to increase the use of wooden housing construction products in the total volume of housing construction to 20%. The corresponding tasks were set by the Strategy for the development of the forestry complex of the Russian Federation until 2030 and the Strategy for the development of the construction industry and housing and communal services of the Russian Federation for the period until 2030 with a forecast until 2035 [2;3].

In recent years, the use of wooden structures in housing construction has begun to gain demand, mainly in the construction of individual housing. It is worth noting that until 2019 in Russia it was allowed to design buildings made of wooden structures no higher than three floors. Only in 2021, the Russian Ministry of Construction began to consider the possibility of building multi-storey wooden houses of four or more floors.

Among the most significant problems in the development of wooden housing construction are the following:

- lack of a full-fledged regulatory framework to ensure fire, mechanical and seismic safety of objects made of wooden structures in the multi-storey construction segment, insufficient study of these issues;
- the high cost of wooden house kits compared to houses built using economic methods;
- high logistics costs (interregional and intraregional) both for the transportation of harvested wood from harvesting sites to wood processing enterprises, and for the transportation of wood building materials and ready-made house kits to consumers;

- dependence on imported equipment for the production of wooden structures;
- lack of preferential bank lending programs for low-rise housing construction using prefabricated wooden houses (including industrial methods);
- low rates of issuing mortgages for the construction of individual housing;
- insufficient experience of the regions in the use of wooden load-bearing structures in the implementation of integrated development projects of territories.

The intensification of the activities of stakeholders in the development of multi-storey wooden housing construction in the country led to the development of Recommendations [1], within which the regions were instructed to: develop regional measures to support domestic manufacturers of wooden house kits; expand the use of wooden housing construction in the construction of apartment and multi-storey buildings (especially for those displaced from emergency housing, fire victims and other categories of citizens who have housing benefits), etc.

To solve the identified problems and implement the tasks set by the state in the field of development of wooden housing construction, the country's forest regions are currently adjusting their territorial development strategies. The strategic objectives of the development of the timber industry complex of each forest region must be "linked" to the state program for the development of wooden housing construction; only in this case there is hope for its full implementation.

The concept for the development of wooden house-building in the Komi Republic for 2023-2030 is the main system-wide document that defines a system of views on the goals, objectives and principles of the development of wooden house-building in the Komi Republic for the long term, developed on the basis of a comprehensive assessment of the current state of the industry and existing problems [4; 5].

Today, the concept of wooden housing construction is an adaptive framework. It should be noted that the regulatory platform of this concept is very significant. It is based on several federal laws and regulations of the Government of the Russian Federation, as well as numerous regulations of regional significance.

The need for the construction of houses from ready-made house kits in the region is determined by the need to build such social facilities as: court sites; post and police departments; multifunctional centers for the provision of public services; centers of additional education (extracurricular activities); tourist complexes within the framework of the state program for the development of domestic tourism in our country [6].

Frame housing construction, which is one of the most flexible systems of wooden construction, is considered the most promising in mass construction. It provides great opportunities for creating a variety of architectural and planning solutions, high performance quality and maintainability.

The main types of wooden house-building products currently produced in the region include frame houses; houses made of profiled timber (dry and natural humidity); houses hand-cut from logs and gun carriages; houses made of rounded logs; houses made of planed logs; houses made of laminated veneer lumber [6].

The advantages of wooden house construction are beyond doubt, since wood is an environmentally friendly material that provides maximum physical comfort for living. Currently, low-rise wooden housing construction is in high demand, and in the future, frame housing construction will determine the consumption of round timber, planed moldings, and laminated veneer lumber products.

Despite the obvious advantages of wood materials, in our republic, as in other forest regions, there are quite serious problems in the development of the production of wooden house kits, these are:

- insufficient development of high-tech industries;
- decrease in stocks of quality wood;
- insufficient increase in the output of wooden house-building products due to ineffective diversification of production;
- reducing the material and energy intensity of production in conditions of higher rates of growth in prices and energy tariffs, which leads to a deterioration in the technical and economic performance indicators of enterprises and a decrease in their competitiveness in commodity markets;
- low transport accessibility of forests, lack of government support for the construction of year-round logging roads;
- insufficiently efficient use of generated wood waste and illiquid firewood for energy needs;
- lack of sufficient reserve capacity at existing production facilities, which does not allow increasing production volumes;
- low level of funding for research and development work both from the state and from business for the development of innovative technologies for the manufacture of wooden house-building products;
- a growing shortage of highly qualified personnel for wooden house-building enterprises, a lack of professional personnel in blue-collar specialties and engineering and technical specialists.

To solve the most significant problems in the field of wooden housing construction at the beginning of 2024 State authorities of the constituent entities of the Russian Federation were instructed to consider the following issues:

- on the development of additional regional measures to support domestic manufacturers of wooden house kits, wood building materials and other wooden structures;
- on expanding the use of wooden housing construction in the construction of multi-apartment low-rise residential buildings, as well as social infrastructure facilities;

- on the widespread use of sets of houses with a high degree of factory readiness based on a wooden frame, massive wooden panels and glued structures for the construction of residential buildings as part of the implementation of regional programs for the resettlement of citizens from emergency housing stock;
- on the possibility of using a mechanism for issuing certificates to certain categories of citizens to receive domestic factory-made wooden house kits;
- on the formation of a unified data bank of vacant land plots for the purpose of their further provision for individual housing construction using an industrial method;
- on the formation of regional programs for the development of individual housing construction, including the industrial method, containing measures for the formation of development zones, synchronization of investment programs of resource supply organizations with territorial planning documents;
- on the possibility of providing citizens constructing individual residential buildings in areas where there is no gas supply with subsidies to compensate for part of the costs of purchasing and installing heating boilers that use biofuel (pellets, sawdust) as fuel.

The Government of the Komi Republic proposes to place the main emphasis on existing federal government support measures, such as:

1. Compensation to Russian manufacturers of wooden house kits for compensation of lost income associated with the provision of discounts to individuals for the purchase of such wooden house kits, established by Decree of the Government of the Russian Federation of November 18, 2022 No. 2093[7];

2. Conclusion of a concession agreement in accordance with Federal Law dated July 21, 2005 No. 115-FZ “On Concession Agreements” or on the terms of a public-private partnership in accordance with Federal Law dated July 13, 2015 No. 224-FZ “On public-private partnership, municipal-private partnership in the Russian Federation and amendments to certain legislative acts of the Russian Federation” in order to implement projects for the creation and reconstruction of social facilities.

3. Concluding offset contracts for the purpose of developing the production of wooden house kits, within the framework of which the investor localizes the production of necessary building materials (products, structures) on the territory of a constituent entity of the Russian Federation, and the region guarantees the purchase of a certain volume of manufactured products for the period of implementation of the contract.

Enterprises of the Komi Republic implementing large investment projects, for example, Promtekh-invest LLC, Pechora Sever Les LLC, are possible as potential suppliers of house kits.

At the end of 2023, the Government of the Komi Republic also considered the possibility of providing additional support from the federal budget to manufacturers of wooden house kits to reimburse part of the costs associated with the acquisition of domestic equipment or manufacturers from friendly countries in order to create and modernize production of wooden house kits.

The extension of this support measure to manufacturers of woodworking equipment would have a positive impact on the development of domestic mechanical engineering, and would also be an incentive for timber industry enterprises to increase production capacity, develop the production of new types of products with higher added value, create new jobs, and increase wages fees, which will slow down the outflow of personnel and increase the attractiveness of blue-collar professions.

Taking into account the problems of training highly qualified personnel for wooden house-building enterprises, the lack of professional personnel in blue-collar specialties and engineering and technical specialists in this field, the Syktyvkar Forestry Institute is considering the possibility of opening new programs for training specialists and retraining existing personnel to eliminate the growing personnel shortage.

Thus, state support at all levels of enterprises of the republic producing elements of wooden house-building, including additional kits in general, will allow to preserve and support enterprises of the timber industry complex of the region in the current difficult economic situation, and will also be an incentive for the use of wooden house-building technologies in the construction of various social facilities.

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通过区块链在公司结构层面的干预来改变交易成本
**TRANSFORMATION OF TRANSACTION COSTS THROUGH
BLOCKCHAIN INTERVENTION AT THE LEVEL OF CORPORATE
STRUCTURES**

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注解。众所周知，新的数字技术会对生活和公共机构的许多领域产生变革性影响。评估了在企业部门使用区块链的主要优势，并分析了该技术对企业内部业务流程转型的影响。

关键词：数字化、交易、交易成本、转型、区块链、区块链干预。

Annotation. *New digital technologies are known to have a transformative impact on many areas of life and public institutions. The key advantages of using blockchain in the corporate sector are assessed, and the impact of this technology on the transformation of internal business processes of corporations is analyzed.*

Keywords: *digitalization, transactions, transaction costs, transformation, blockchain, blockchain intervention.*

In the context of the digital transformation of socio-economic systems, it is necessary to pay special attention to the digitalization of processes occurring at the level of corporate structures. This contributes to the collective emergence of innovations in the form of network formats, where legally independent participants interact and the degree of intellectualization of the innovative environment of enterprises increases. It is important to note that the effectiveness of any cyber-social system depends on providing secure and reliable interaction during transaction processes. The transition to a digital economy involves minimal human intervention in information processes.

A major role in the digital economy is played by the security and transparency of transactions between participants, which can be ensured thanks to blockchain and smart contract technologies. To reduce risks, distributed ledger technology (blockchain) is increasingly being used, which reduces the likelihood of fraud and eliminates the need for a third party. Blockchain supports a variety of decentralized applications due to its immutability and trustless properties. However, there

are no universal criteria for building a blockchain architecture at the level of various corporate structures [1].

Definition of “blockchain” is increasingly discussed both in foreign literature and among domestic specialists. The first steps in the development of blockchain were taken in 1991 by cryptographers S. Haber and W.S. Stornett. Scientists were looking for ways to create chains of cryptodata and organize this information into separate blocks. However, as a result of the global economic crisis, there was no particular interest in the development of blockchain intervention until 2008. From 2008 to the present, the potential of blockchain is developing, new applications are being created, a centralized approach is based on a distributed decentralized network and includes solving cybersecurity issues.

According to statistical data, we can conclude that since 2019, the interest of corporate structures in the practical use of blockchain for large financial and management structures has increased. The following structures are distinguished: banks, government agencies, trade unions, and defense and security forces. However, crises and epidemics have a limiting effect on the development of information technology. In the future, the global economy will face new questions about the role of information technology in global infrastructure and its ability to respond to future crises.

Blockchain is a continuous sequential chain of blocks (linked list, distributed registry) containing information about participants and existing innovations [2]. Copies of block chains are stored and processed on different network nodes independently of each other.

The term “blockchain” originated as the name of a fully replicated distributed database (registry), first used in the Bitcoin system, to support transactions in cryptocurrencies. However, blockchain technology can be applied to any interconnected information objects. The data included in it is stored on the network nodes of users of the distributed registry system. Each node stores a piece of information in the form of blocks of information or copies of these blocks. This principle can make the system virtually immune to threats and attacks, especially since cryptographic keys, which are calculated using a hash function calculation algorithm, protect the blocks. In Figure 1 shows an example of a transaction using a distributed registry.

The benefits of blockchain include transparency of transactions and multiple copies of transactions, which provide each participant with information about every step of all stages of the process. This is important for creating trusting and transparent relationships between project participants, as well as other interested regional subjects of socio-economic activity of various corporate structures.

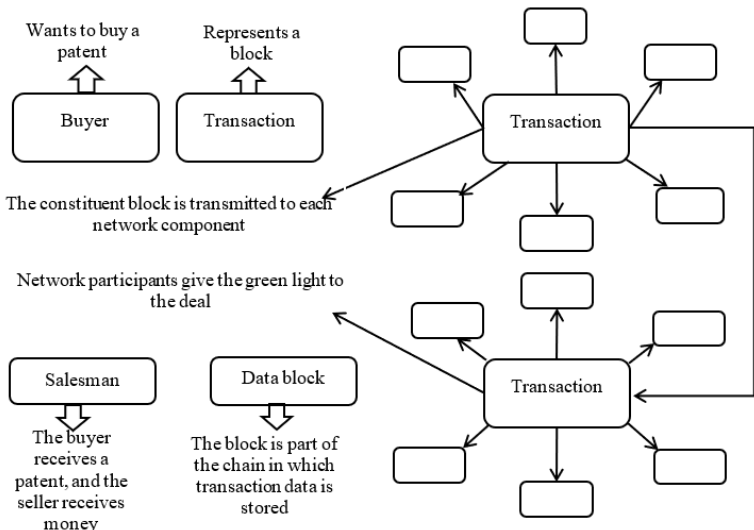


Figure 1. Scheme of a transaction using a distributed registry of blockchain intervention at the level of corporate structures

Blockchain technology makes it possible to store in a distributed storage the data necessary to ensure a transaction or information interaction between many agents.

Data storage in a corporate system may include documents for goods or services, financial transactions, contractual obligations, personal data, intellectual property rights, digital descriptions of intellectual property, information about enterprises, and more. The technology allows you to deposit authorship without intermediaries and without reference to location, confirming the authenticity of the information with a digital certificate. A digital certificate confirms the authenticity of information objects. Thanks to blockchain, authors will be able to confirm authorship and intellectual property rights. The technology allows you to ensure security when storing updated information about any objects at the level of corporate structures. The distributed registry will also make it possible to track the life cycle of the results of innovative activities and the impact of the results obtained in the process of synthesizing new technologies being implemented [3].

Patent holders can use the results of scientific research to register rights without specifying the source. The creation of a blockchain network for intellectual property and scientific publications will make it possible to track the process of transfer and use of knowledge in the process of synthesizing new results of intellectual activity, ensuring fair distribution of rewards.

Ascribe uses blockchain technology to help artists confirm authorship of works of art through unique identifiers and digital certificates. It provides for the transfer of ownership from the artist or author to the buyer or collector. An example of the use of blockchain technology in the field of intellectual property rights management in Russia is the implementation of the IPChain network on the Hyperledger Fabric platform. This platform allows you to work with different channels of information within one ledger, defining a transaction confirmation policy for each of them. Hyperledger Fabric is a working project of a consortium led by IBM, which includes such major companies in the IT industry as Intel, Oracle, Cisco, Digital Assets and others. The main advantage is an adaptive algorithm for achieving agreement between trusted nodes through a mechanism that allows transactions to be decentralized to register on a given number of peer nodes and, if the results are verified, to confirm the transaction. The IPChain infrastructure includes a linked registry of intellectual property objects and a registry of transactions with these objects, transaction registration nodes, a queuing mechanism, transaction recording nodes, network management nodes and issuance of trusted certificates.

To understand the transformation of economic activity using blockchain technology, transaction costs are used as a theoretical tool for analyzing the impact of blockchain. Blockchain does not eliminate transaction costs, but it does facilitate their transformation, creating more efficient economic entities within corporate structures.

The concept of transaction costs aims to increase the economic efficiency of the exchange of goods and services in the market. Together with production costs, transaction costs play an important role in finding efficient economic actors and setting the boundaries for decision-making defined in smart contracts.

Thanks to smart contracts, blockchain makes it possible to reduce the time of transactions while increasing their volume. In a fully decentralized market, participants can freely interact with each other, transacting through a consensus mechanism. Blockchain programmability saves time on transactions and increases their frequency. Scalable consensus allows participants to perform an increasing number of transactions in a decentralized manner.

The process of optimizing the level of transaction costs at the present stage of development of corporate management structures requires the use of tools that allow reducing the size of transaction costs in the total volume of transactions associated with the globalization of the economy and changes in the technological paradigm.

First, it is necessary to study the level of informatization of production and management processes, as well as to identify current problems of informatization of the domestic economy in general and the enterprise specifically.

The process of digitalization of enterprises in the Russian Federation lags behind the world level, although there is a trend of positive dynamics. The use of software for doing business in domestic enterprises is shown in Fig. 2 [5].

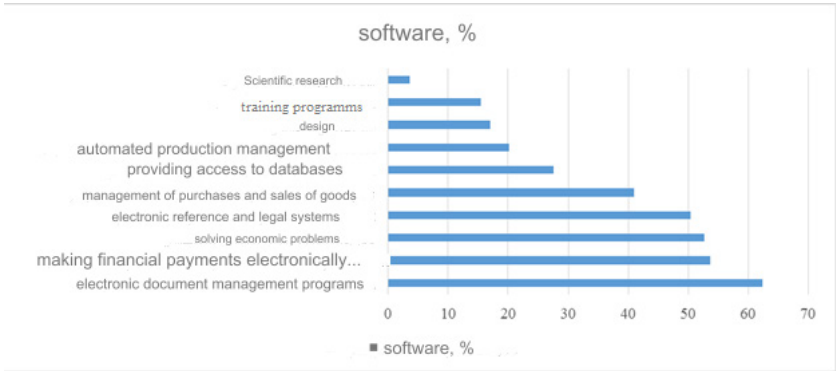


Figure 2. Use of software at enterprises of the Russian Federation (as a percentage of their total number)

Considering the data in the figure, we can conclude that the use of software for production at enterprises of the Russian Federation remains insufficient, even within the document flow, where informatization is clearly capable of improving the quality of decisions made and speeding up the exchange of information [5].

It is known that any corporate management structure that wants to apply modern information technologies must analyze its financial, human and material resources.

Blockchain is another modern technology in the context of growing digitalization of the economy of enterprises and society.

Its dominant advantages should be the creation of a trusting environment in the company and between participants in business processes, the implementation of revolutionary digital innovations, as well as ensuring security and openness when conducting digital transactions [5].

This technology can lead to significant discoveries and advances in processes ranging from finance to pharmaceuticals, from government services to humanitarian work and promoting sustainable development. Blockchain makes it possible to conduct open, secure and fast transactions, which creates the basis for cryptocurrency transactions.

Blockchain technology was created for the development of Bitcoin and is an integral core part for other cryptocurrencies. It provides security and the ability to conduct trusted peer-to-peer transactions, which are recorded in a distribution ledger known as a distributed transaction ledger. In addition, the blockchain ensures the protection of this distributed ledger by combining data blocks, using cryptographic methods and applying a certain algorithm that can help reach agreement on transactions (Fig. 3).

To explore in more detail the potential impact of blockchain technology on achieving sustainable development goals, more reliable information is required, which is currently insufficient.

To analyze the impact of blockchain on sustainable development, various forward-looking scenarios, or a forward-looking approach, are used that can take into account possible unintended consequences.

Blockchain intervention technology brings several benefits, trust and transparency, to existing Internet-based business services and helps improve corporate governance. In turn, smart contracts significantly reduce transaction execution time, but quickly increase their volume. The development of blockchain applications will provide a framework for building trust between peers through a consensus mechanism that will allow businesses to build trust and operate in a more decentralized manner.

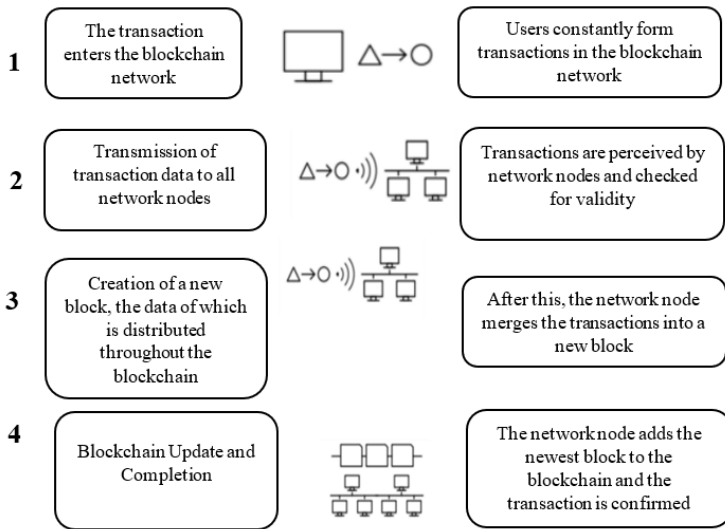


Figure 3. Algorithm for the operation of blockchain technology

In general, the use of information technologies in the activities of corporate management structures helps to improve communication processes, reduce business costs and optimize the procedure for making complex management decisions in conditions of uncertainty and risk. The introduction of information and communication technologies, as experience in their use has shown, increases the operating efficiency of enterprises, improves corporate governance, and establishes beneficial connections between the company and its environment. The successful

implementation of digitalization and information technology in the work of corporate management structures creates the prerequisites for increasing their sustainable development.

Blockchain technology provides the opportunity to increase transparency, traceability and reliability across all important value chains, which will have a positive impact on the stability and sustainability of enterprises.

Blockchain technology represents a powerful tool for the pursuit of sustainable corporate development. Its use in the decision-making process reduces transaction costs of the industrial sector. The unlimited application of blockchain technology makes it possible to develop technological solutions that promote sustainable development. A high-quality blockchain application will ensure reliable storage of information.

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基于“绿色经济”的电子商务物流发展
COMMERCE LOGISTICS DEVELOPMENT BASED ON “GREEN
ECONOMY”

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摘要:随着中国新兴企业的发展,各种网络平台开始涌现,人们对电子商务物流有了新的理解,但也对物流配送提出了新的要求。然而,环境问题也是一个重大挑战,各行各业的低碳转型已成为一个不可避免的趋势。越来越多的公司也开始设计和发布自己的目标和实施路线。发展“绿色”电子商务产业已成为我国可持续发展的重要组成部分。

关键词:电子商务、电子物流、绿色经济、可持续发展

Abstract. *With the development of China's emerging enterprises, various network platforms have begun to sprout, people have a new understanding of e-commerce logistics, but also put forward new requirements for logistics distribution. However, environmental issues are also a major challenge, and the low-carbon transformation of all walks of life has become an inevitable trend. More and more companies are also starting to design and publish their own goals and implementation routes. The development of “green” e-commerce industry has become an important part of sustainable economic development in our country.*

Keyword: *E-commerce, e-logistics, green economy, sustainable development*

Introduction. With the development of the new era, the convenience of e-commerce “staying at home” has become the most common way of shopping for the public, and has also become an important engine for the comprehensive digital transformation of the economy and society. According to the data survey, in 2023, China's annual online retail sales of 15.42 trillion yuan, an increase of 11%, more than 500,000 per second, becoming the world's largest online retail market for 11 consecutive years. The value added of physical goods accounted for 27.6% of the total value added, a record high. Green, healthy and smart products are favored. Although the rapid development of e-commerce, but its opposite is indeed the problem of environmental protection, can not be ignored. Product design, product packaging, transportation, returns and packaging recycling all pose great challenges to the development of e-commerce.

Product packaging. In plastic pollution, many polystyrene, polypropylene, polyvinyl chloride and other products produce pollutants. Many companies have embarked on a series of “green activities” for the sake of corporate sustainability, such as plastic reduction initiatives, where they can switch to environmentally friendly packaging, such as recycled cardboard or biodegradable plastics, to enhance the user experience. Reusing 10 percent of the world’s plastic products would help reduce annual Marine waste emissions by nearly half. Therefore, the introduction of reusable packaging models has become one of the important strategies to reduce plastic pollution sources.

A company in order to recycle the delivery box launched a new green product - degradable biological material carton, which has a strong environmental protection function for ordinary cartons, will not produce any environmental pollution. It further promotes the cultivation of green consumption concept and the formation of green consumption habits. Environmental awareness has gradually become a part of our life.

Paper versions of order information and flyers are printed out before the product is shipped. In the Last Mile Problem, the “paperless concept” was proposed, which saved a lot of time and limited resources. This is also a good choice for e-commerce logistics.

Green logistics. Green logistics is highly linked to environmental protection, reducing environmental pollution, reducing resource consumption, and improving efficiency for the purpose of using advanced logistics technology to plan and implement transportation, storage, loading and unloading, circulation and processing activities.

In the traditional logistics and transportation, there is a lot of energy consumption, and a lot of waste emissions cause huge pollution to the environment. During the storage process, some chemical products may also pollute the surrounding area, and may even leak and explode, seriously polluting the environment. In addition, the product transportation packaging also has large packaging, excessive packaging, packaging waste problems, resulting in waste. So green logistics is essential. The key to green logistics is transportation and warehousing, because these two links produce a lot of greenhouse gases, which can be optimized in a large space. Ikea’s logistics system is excellent. In order to reduce costs, IKEA’s distribution centers and central warehouses around the world are basically set up in traffic arteries and distribution centers to facilitate logistics. One of Ikea’s most famous features is its flat-pack strategy. Whether it is storage or transportation, the use of flat packaging can reduce the damage rate of furniture in the storage and transportation process and occupy warehouse space. More importantly, flat packaging greatly reduces the transportation cost of products, making IKEA’s world-wide production layout a reality.

Green pickup point. To avoid the accumulation of a large number of goods, waste of resources, various places are also placed a variety of large and small pick-up points, such as the supermarket at the door, large shopping mall express service points, but these have the time limit to pick up goods, when people do not have time to pick up express, a large number of express piled up. It is precisely for this reason that express cabinets have also begun to rise, and each community has set up a express service cabinet to facilitate the time of residents. You can not only pick up the express, but also return the after-sales service. In addition, in order to encourage users to improve environmental awareness, express cabinets can also set up garbage recycling services, and put those packaging cartons into the express cabinets for degradation after use, so as to obtain additional income, such as 0.5 yuan per catty carton.

Merchandise return. In order to meet the customer experience, setting a seven-day no-reason return is essential. However, the waste of resources generated by customers' returns is also inevitable. The fuel problem caused by the return journey has also become a focus of environmental protection. In order to reduce zero waste of resources, businesses can launch "AI and other scale amplification", such as the size of the furniture purchased by customers, you can choose the size, color and other needs through AI, which can both increase the user experience and reduce the return rate of technology.

Green recycling. Green recycling includes a complete recycling system, which emphasizes the recycling of products at the end of their life cycle to enter reverse processes such as reuse and remanufacturing, and sends products to the source of the supply chain, which is the hands of suppliers, to achieve a closed-loop supply chain.

Ikea has always made circular supply chain and reverse logistics part of the company's sustainability strategy, so green recycling is also an essential part. In 2016, Ikea's chief sustainability officer Steve Howard announced measures for Ikea's recycling service: recycling used furniture, you can exchange for cash points; Consumers are encouraged to bring back broken or discarded plastic, batteries, furniture, fluorescent lights, mattresses and textiles to IKEA stores. Ikea will pay a certain fee to the consumer based on the use of these products and the properties of the materials. And these recycled products will be processed through remanufacturing and harmless treatment and recycling. The project has proved successful. Just a few months after the service began, the IKEA store in Moscow recycled more than six tons of batteries. Ikea stores in Norway recycle about 25 tons of textiles over the course of a year.

Suggestions and measures. 1. Strengthen the promotion and utilization of new energy. At present, the most effective way to solve the environmental problems caused by the logistics industry is to promote the use of new energy. Among

them, new energy vehicles have significant significance in reducing carbon emissions, reducing air pollution and saving energy in logistics transportation. This can not only promote the development of green logistics, but also promote the rapid development of the new energy vehicle industry, while providing positive policy support for the promotion and development of the green economy.

2. Foster green development. Focus on the whole logistics industry chain, and promote green logistics to related logistics companies, logistics suppliers and e-commerce platforms cooperating with them. The government increases the investment in green logistics infrastructure, establishes the concept of green logistics in supply chain management and operation, and enables logistics enterprises to actively promote green transportation in logistics centers, and uniformly plan green logistics centers in accordance with relevant green requirements.

3. Promote technological innovation of logistics enterprises. Promote and develop the research and application of green transport technology through compliance with relevant environmental standards and green requirements, as well as through independent research and development and introduction of advanced green logistics technology. In the era of rapid development of the Internet, green logistics should also make full use of electronic science and technology, such as big data, Internet of things and blockchain.

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负责人在确保组织可持续发展的框架内实施ESG战略的责任
**THE RESPONSIBILITY OF THE HEAD FOR THE
IMPLEMENTATION OF ESG STRATEGIES WITHIN
THE FRAMEWORK OF ENSURING THE SUSTAINABLE
DEVELOPMENT OF THE ORGANIZATION**

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注解。企业在可持续发展框架内实施ESG战略的需求日益增加。将ESG原则融入其战略的公司有更大的成功机会。然而，为了获得预期的效益，有必要有效地制定战略、实施战略以及对既定目标的实施进行高质量的控制。这些问题的责任在于公司管理层。作者分析了企业家的主要责任类型，以及管理者在实施ESG战略中的角色。研究的结果是，对企业家责任的经济、法律、社会、道德和环境方面进行了审查，并揭示了它们之间的关系。

关键词：企业家责任、ESG战略、ESG风险、组织可持续发展、企业社会责任。

Annotation. *The implementation of ESG strategies by companies within the framework of sustainable development is becoming more in demand every day. Companies that integrate ESG principles into their strategy have a greater chance of success. However, to obtain the desired benefits, it is necessary to competently develop a strategy, its implementation and high-quality control over the implementation of set goals. Responsibility for these issues lies with the company's management. The authors analyzed the main types of responsibilities of an entrepreneur, as well as the role of the manager in implementing ESG strategies. As a result of the study, the economic, legal, social, ethical and environmental aspects of the entrepreneur's responsibility were examined and their relationship was revealed.*

Keywords: *entrepreneurial responsibility, ESG strategy, ESG risks, sustainable development of the organization, corporate social responsibility.*

The concept of responsibility is quite broad and multi-valued; it is applicable to many areas of human life. To one degree or another, this definition is revealed by every science. For example, in philosophy, the issue of responsibility is often associated with the concept of “freedom”, since freedom is the main condition for responsibility, and responsibility is a manifestation of freedom. That is, a person is free to take any actions in accordance with his desires, but he also bears full personal responsibility for the negative consequences of his actions and cannot shift the blame to others. For the first time, the ancient Greek philosopher Aristotle quite succinctly revealed the concept of responsibility. Hans Jonas gave a special place to the modern understanding of responsibility in his work “The Principle of Responsibility. Experience of ethics for a technological situation” [7]. He notes that technological developments in society have a significant impact and a new concept of an ethics of responsibility is needed. Man must take responsibility for the future of all humankind.

An entrepreneur is an innovative, risk-taking person engaged in the transformation and the best combination of the main factors of production for organizing business activities, bearing material, social, ethical and environmental responsibility, in order to make a profit and meet the needs of society. Often the entrepreneur (business organizer) is himself the head of the company.

It is worth noting that today the responsibility of entrepreneurs has a particularly great influence, since the results of their activities directly affect the environmental situation in the country, social security, the level of economic crime, rational consumption of resources, providing the population with quality products and services, the standard of living of the population, unemployment and many other socially significant categories. That is why the issues of responsible behavior of companies and ensuring sustainable development are especially relevant today in the rapidly developing technological world.

Many companies strive to ensure the sustainable development of the organization through the implementation of ESG strategies, namely activities aimed at solving environmental, social and governance issues. The concept of sustainable development implies responsible and harmonious development of the world, taking into account the impact of the production sector on the environment, the use of natural resources, the development of new technologies, the realization of the potential of qualified employees, and the rational distribution of investments to strengthen existing potential.

Implementing an ESG strategy and ensuring its suitability is primarily the responsibility of company leaders. They provide direct oversight of ESG risk management through risk identification, assessment and mitigation. Responsibility to all stakeholders is an integral part of running a successful business. It is therefore important that entrepreneurs are aware of their responsibilities and act ethically

and legally in all aspects of their activities. Thus, we can identify several main interrelated aspects of the responsibility of an entrepreneur: economic, legal, social, environmental, ethical, corporate.

Next, we will consider each aspect of responsibility individually and in combination as part of the implementation of the ESG strategy using the example of the largest Russian energy company Gazprom Group [9].

The economic aspect of the entrepreneur's responsibility. An entrepreneur, as the main subject of the economic system, bears, first, economic responsibility. Thanks to conscientious entrepreneurial activity, the country's economic growth occurs, new technological products are created, investments are attracted, fair competition develops in the market, new jobs are created, the standard of living of the population increases, due to tax payments, the spheres of healthcare, education, social assistance are developed, and the pension fund grows.

The energy company Gazprom Group makes a large contribution to the Russian economy. Its activities can serve as an example of the implementation of economic responsibility of management. The Gazprom Group is the largest taxpayer; in 2022, 5.3 billion rubles were paid to the country's budget. Gazprom also makes large investments in the development of the country's regions, increasing their economic development and creating jobs for local residents [9].

Law establishes economic responsibility, like legal responsibility, and non-compliance with written laws involves punishment in the form of fines, forced labor or arrest in case of violation of financial legislation. Illegal business activities include economic crimes such as conducting illegal operations, operating without licenses, and tax evasion.

Legal aspect of entrepreneur's responsibility. An entrepreneur is also a subject of legal relations. Based on the organizational and legal form of the company, he bears the corresponding legal responsibility - a measure of state regulation in the event of an offense committed through personal, property or organizational liability. Depending on the nature of the offenses, administrative liability is distinguished - the Code of Administrative Offenses [2], tax liability - the Tax Code of the Russian Federation [3], criminal liability - the Criminal Code of the Russian Federation [4] and civil liability - the Civil Code of the Russian Federation [1]. Every business leader, before starting their business, needs to familiarize themselves with the basic regulatory laws and regulations, comply with them in good faith, and regularly update his knowledge in the legal field.

Social aspect of entrepreneur's responsibility. Social responsibility today is perhaps the most important aspect of an entrepreneur's responsibility, since it includes not only responsibility to society, but also to all stakeholders. The international standard ISO 26000 "Guidelines for Social Responsibility" [5] most precisely and succinctly defines the concept of social responsibility: "it is the

responsibility of an organization for the impact of its decisions and activities on society and the environment through transparent and ethical behavior that:

- promotes sustainable development, including the health and well-being of society;
- takes into account the expectations of stakeholders;
- complies with applicable law and is consistent with international standards of conduct;
- integrated into the activities of the entire organization and applied in its relationships” [5].

The concept of corporate social responsibility (CSR) is more applicable to social responsibility in the modern business community. It means that all organizations are responsible to their stakeholders (employees, partners, investors, consumers, creditors, the state, society as a whole) and must ensure an improvement in their quality of life. The fundamental principle of CSR is compliance with legal norms, that is, first, a socially responsible business needs to familiarize itself with the current legislation and regularly monitor its implementation. Companies also need to focus their efforts on solving socio-economic problems, corporate governance issues, ethical issues of the company, improving the environmental situation, improving the quality of products and services provided, and developing innovative activities.

Corporate social responsibility, depending on the size and strategic priorities of the company, is multi-level. The first level (economic responsibility) implies the fulfillment of obvious social responsibilities: payment of wages, payment of taxes, and provision of jobs. The second level (legal responsibility) involves providing employees with better living and working conditions: social benefits, improved living conditions, additional training, and medical services. The third level (ethical responsibility) involves the implementation of charitable activities.

Corporate social responsibility can also be implemented at the external and internal levels. The internal includes all of the listed activities at the first and second levels, such as advanced training, labor safety, a comfortable workplace, fair wages, etc. The external level includes environmental protection, interaction with local government agencies, corporate responsibility and liability to the consumer to improve the quality of goods and services [6].

The result of the implementation of the corporate social responsibility policy is the non-financial reporting of companies. As an example, consider the report on the social activities of the Gazprom Group for 2022 [9]. The social report speaks of a high level of social responsibility: the energy company is implementing the “Gazprom for Children” project, aimed at promoting a healthy lifestyle of the younger generation, an innovative project for orphans “Passport to Life”, a multi-functional social project “Friends of St. Petersburg” (historical cultural heritage),

patriotic and humanitarian programs, donor programs and much more. In addition to projects useful for society as a whole, the company provides support to its employees: ensuring equal rights for employees, material and non-material incentives, social security, personnel training, ensuring production safety and labor protection [9]. Thus, we can say that the implementation of the social responsibility of an entrepreneur has a beneficial effect not only on the company itself, but also on all its stakeholders.

Ethical (corporate) aspect of entrepreneur's responsibility. Compliance with the business ethics of an entrepreneur is also an integral part of successful business. Managers and employees must bear complex ethical responsibility and act for the benefit of the general interests of the company: economic development, support for stakeholders, and global interests of society.

The Gazprom Group is also an example of ethical business conduct. The company's corporate principles are presented in the Social Report for 2022. Gazprom has implemented a Code of Corporate Ethics, which sets out the core corporate values, procedures for action in the event of a conflict of interest, and guidelines for action in the event of corruption disputes. The company also provides training on corporate ethics for employees and suppliers, has a separate committee on corporate ethics, and pursues an active anti-corruption policy. The organization provides for penalties for violations of the Code of Ethics: public reproach or public condemnation, deprivation of bonuses or disciplinary action [9].

Thus, we can say that the ethical responsibility of an entrepreneur is to comply with the laws and regulations of doing business, and should act to comprehensively satisfy the interests of the company: sustainable economic development, the interests of stakeholders and solving global problems of society. Today, the moral and ethical responsibility of business places emphasis on conducting fair competition, reducing corruption, socially responsible investments, the moral climate in the organization, business etiquette, and the organizational culture of the company.

Environmental aspect of entrepreneur's responsibility. An equally important aspect of entrepreneurial responsibility is the environmental aspect. Many companies, from the smallest organizations to large industries, have an impact on the country's environment. Environmental risks are increasing every year and in the near future, no investor will invest their assets in companies that do not implement environmental conservation policies. So, for example, in 2020, a major global investor refused to invest his funds in the amount of 25 million rubles. to the large Russian company JSC Russian Railways due to the large number of transportations of carbon cargo [8].

As with other aspects of liability, there are environmental laws that provide for certain sanctions against companies that violate them. Depending on the severity of the violation in the field of environmental protection, various types of liability

are provided: fines, suspension of activities, correctional work, arrest (in case of violations that entailed serious consequences in the form of mass death of animals, poisoning of water and air resources, human death). The main requirement for any entrepreneur in the area of environmental responsibility is compliance with environmental laws and regulations, as well as constant monitoring of the environmental situation in the company.

The Gazprom Group can also serve as an example of the implementation of environmental policy. The company is very interested in preserving the environment for future and current generations, since it is a key link in the oil and gas sector and is engaged in a large number of works directly related to the colossal impact on the country's ecology. The activities that the organization implements in this area are as follows:

- ensuring environmental safety of production;
- increasing energy efficiency, introducing energy-saving technologies;
- management of greenhouse and atmospheric emissions;
- protection of water resources (increasing the efficiency of wastewater treatment, construction and modernization of water treatment systems, recycling and reuse of water);
- waste management (use of low-toxic drilling fluids, recycling of waste with further use for construction);
- conservation of biodiversity (suspension of work during the nesting period of birds, participation in the program to restore the population of the Far Eastern leopard, protection of polar bears, reclamation of disturbed lands, sponsorship of many environmental projects) [9].

Thus, we can say that the entrepreneur (manager) bears a comprehensive responsibility for ensuring the safety of his employees, for complying with environmental standards, for participating in the socio-economic development of society and for maintaining the reputation of his brand.

As recommendations for managers on development and implementation ESG strategies can be distinguished as follows:

When developing an ESG strategy, you must follow the following algorithm: assessing the existing strategy, conducting an analysis of the internal (SNW analysis) and external (PEST analysis, SWOT analysis) environment; benchmark analysis of the industry, identifying the main trends and advantages of ESG strategies implemented in the market; defining/adjusting the company's mission and vision; analysis of interests within the framework of sustainable development of stakeholders (investors, employees, partners, society and the state); determining the main directions and goals of the ESG strategy; developing a plan to achieve your goals (road map, Gantt chart); appointment of a responsible department for the development and implementation of the strategy.

It is worth noting that the main goals of the ESG strategy must be linked to the UN Sustainable Development Goals (SDGs) [10], formulated in the 2030 Agenda for Sustainable Development (Figure 1). Each company, in accordance with its activities, can choose several SDGs, within the framework of which it will set priority goals for itself. Thus, the company will improve its image in the market, ensure the loyalty of investors, consumers, employees, the state and become more competitive.



Figure 1. UN Sustainable Development Goals [10]

The implementation of an ESG strategy should include the incorporation of set goals into the company's existing organizational and business processes, and regular reporting on completed plans and tasks.

Control over the implementation of the ESG strategy rests with the company's management and includes regular monitoring of achieved goals and objectives, possibly involving independent environmental assessments and conducting an audit according to social standards. As a result of implementing an ESG strategy, managers need to oversee the production and publication of annual non-financial reporting.

In addition to publishing non-financial reporting and monitoring compliance with the ESG strategy, managers need to pay special attention to the internal Russian rating, which evaluates companies on their adherence to ESG principles. The most famous is the RAEX rating, compiled by an independent credit rating agency [11]. Obtaining an ESG rating will increase the attractiveness for foreign investors and credit institutions.

It is also important to note that when choosing an investment object, a socially responsible investor pays attention to the non-financial reporting of companies.

ESG factors have a particular impact: environmental, social and governance. Investors' assessment of the implementation of an ESG strategy allows not only to minimize risks and make a profitable investment, but also to take into account ethical considerations. This means that every leader must take great care in developing, implementing and monitoring compliance with the company's ESG strategy.

Thus, we can say that thanks to the implementation of an ESG strategy, a business acquires a wide range of advantages, such as sustainable economic growth, loyalty from stakeholders, a high image, increased competitiveness, reduced ESG risks, attracting socially responsible investors, and in the absence of ESG -strategies and conducting dishonest business activities, the company acquires a large number of problems in the form of fines, arrests, negative reactions from stakeholders, and a decrease in image.

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企业对外经济活动可持续性的本质与评估
**THE ESSENCE AND ASSESSMENT OF THE SUSTAINABILITY OF
FOREIGN ECONOMIC ACTIVITY OF THE ENTERPRISE**

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注解。研究了可持续发展概念的定义方法。可持续性范畴的本质在对外经济活动领域得到体现。挑选出企业对外经济活动可持续发展的指标。从企业在国外市场发展的定位出发，得出了稳定性评估的特殊性的结论。

关键词：可持续性、对外经济活动的可持续性、可持续性诊断指标。

Annotation. *Approaches to the definition of the concept of sustainable development are studied. The essence of the category of sustainability in the sphere of foreign economic activity is reflected. The indicators of sustainable development of foreign economic activity of the enterprise are singled out. The conclusion about specificity of stability assessment from the position of enterprise development in the foreign market is made.*

Keywords: *sustainability, sustainability of foreign economic activity, indicators of diagnostics of sustainability.*

Fundamental world transformation causes serious social and economic amendments. Thus, the issue of sustainable development is becoming increasingly relevant. Particularly, it refers to the foreign economic activities of the enterprise since they take on enormous importance in trading, investment, technological progress, cooperation between countries. In conditions of high turbulence, it is essential to identify a number of factor estimators that approve appropriate decisions to carry out foreign economic activity of each company and country overall.

First of all, it should be noted that the phenomenon of sustainability is considered in correlation with the socio-cultural development of society. The understanding of sustainability dates back to antiquity and is associated with the ontological aspect of interpreting the essence of things. Considering «stability» as a property of the system to immutability, constancy, preservation of internal

structure. At the same time, the influence of environmental factors on the mechanism of internal stability is reflected in the change of the object to a certain extent, not exposing the destruction of some constancy of the system, but on the contrary, providing its adaptation and development. This confirms the idea of the existence of sustainability as an aspect of universal change.

From the category of «sustainability» the paradigm of «sustainability of development» was singled out, the emergence of which is caused by the escalation of environmental problems as a result of the intensification of production and increased consumption at the global level. In order to identify the conditions and prerequisites for ensuring the viability of mankind for a long period of time, the conference «Environment and Development» under the auspices of the United Nations was held in 1992. As a result of the conference, the essence of the concept of sustainable development was outlined, which was to ensure an interaction between socio-environmental and economic development that would meet the needs of both current and future generations. For this reason, the concept of sustainable development was initially interpreted from the perspective of the socio-ecological development of society [1, p.112].

According to A. Lebedev and O. Lavrik, the essence of sustainable development consists of a set of measures aimed at changing the structure of consumption in order to reduce the number of environmental problems [2, p.66].

V. Kontyug identifies the concept of «sustainable development» as a transition of society to a higher standard of living, in which the concept of conscious consumption is realized, which leads to a change in human attitude toward nature and an improvement in the ecological space of society [3, p.158].

From the position of the economic approach, the representatives of which are such domestic scientists as A.G. Koryakov, E.A. Dudnikova, D. Kondaurova, L. Zhurova, sustainable development is associated with the achievement of such a state of functioning of the system, which will minimize the negative impact of risks of external and internal environment while rationalizing the use of own resources. Achievement of sustainability in this approach is interconnected with the acquisition of competitive advantages by the business in conditions of market environment variability [4].

In the research the definition of the sustainable development is demonstrated from the point of view of the complex approach, the essence of which is presented in figure 1.

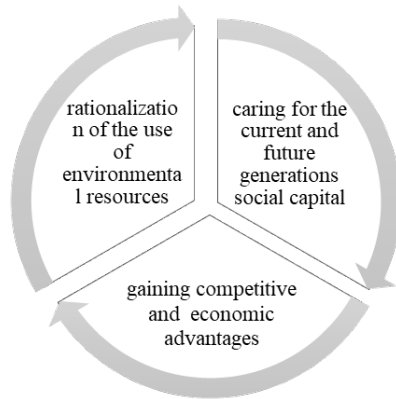


Figure 1. The essence of the concept «sustainable development»

Thus, sustainable development is achievable if the principle of good governance is respected, according to which environmental, economic and social priorities are realized through the rational and equitable allocation of resources and the satisfaction of the interests, including those of the most vulnerable members of society.

However, the problem is that there is lack of researches to outline the category sustainable development of foreign economic activities. In this research we use the following definition of the concept: ability of the enterprise to successfully cope with external economic challenges and changes in the external environment, while maintaining a certain stability of the system.

Based on the essence of the concept of sustainability of enterprise activity, we can conclude that it is necessary to assess the indicators responsible for its competitiveness in the external market.

Measuring sustainability at both macro- and microlevels can not be based on the consideration of individual criteria; it is necessary to assess them in a complex. Unfortunately, there is no single integral indicator to assess the degree of efficiency of transition of an individual enterprise to sustainable development. In this regard, the main emphasis is placed on the construction of a system of indicators.

There are different groups of indicators regarding to the analyze of the external market, including various market and finance tools but these indicators, as a result, provide only a proxy for sustainability [5, 6]. For this reason, they can be harmonized in a way, presented in the table 1.

Table 1

No	Name of the indicators of sustainable development foreign economic activity	Content of the indicators of sustainable development foreign economic activity
1	The measurement of the rates of export and import activities	It is done through horizontal analysis, which includes the measurement of absolute parameters and accompanying relative parameters. One of the indicators reflecting the ratio of export growth to import growth is the integral index of foreign trade. If the value of this index is greater than one, then there is an excess of exports over imports for a given period of time.
2	The share of profit from foreign economic activity in the gross profit of the enterprise	reflects the ratio of profit from the sale of exported products to net profit for the specified period. Thanks to this indicator, it is possible to trace the orientation of the enterprise to the domestic or foreign market.
3	The establishment of cooperation with foreign partners (number of the contracts)	The forms of manifestation of this cooperation can be cooperation strategies represented by the conclusion of a license agreement for franchising, contract management, or by concluding contacts for the sale of products. The ability to maintain foreign trade relations allows to create additional production capacities in a foreign country and achieve the sustainability of the development of the activity of the enterprise subject to foreign economic activity.
4	Integral coefficient of competitiveness of a foreign economic activity enterprise	The calculation of the indicator is carried out through the ratio of the technical indicator to the economic indicator of competitiveness. While the technical indicator is determined by assessing non-price factors of competitiveness presented in the form of the sum of the weights of single parameters. In turn, the economic indicator is determined by the ratio between the consumer's final expenditures for the purchase of goods (services) from the assessed organization and the basic one. Thus, the integral coefficient of competitiveness reflects the technical, marketing and financial capabilities of the enterprise subject to foreign economic activity.
5	Indicators of enterprise solvency	Indicators reflect the liquidity of funds, the ability to cover the obligations of the enterprise at the expense of its own funds. This allows to identify financial sustainability in the context of the development of foreign economic activity in the enterprise.

To summarize, modern conditions of economic activity of enterprises – subjects of foreign economic activity are characterized by high volatility and a large

number of destabilizing economic factors. The necessary condition for sustainable development of foreign economic activity is attention to the issues of competitiveness in foreign markets, which implies the use of modern methods of assessment that are adequate to the external and internal environment and allow companies to take into account the variety of challenges faced by companies.

The sustainability of foreign economic activity subject development directly affects the development of foreign trade relations within the state. The assessment of the sustainability of the development of foreign economic activity by an enterprise is carried out by analyzing local, integral, generalizing and average indicators of foreign economic activity sustainability.

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区域经济体战略稳定性影响因素

**FACTORS INFLUENCING THE STRATEGIC STABILITY OF THE
REGIONAL ECONOMIC SYSTEM**

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注解。 文章对影响区域经济系统战略可持续性的因素进行分类, 为完善区域经济系统和区域可持续发展范式提供理论和方法基础。 研究了经济高质量增长的内生和外生因素及其对提高分配区战略可持续性水平的作用。

关键词: 战略可持续性、区域经济体、社会经济体系、分布区域影响因素。

Annotation. *The article examines the classification of factors influencing the strategic sustainability of regional economic systems (RES) as a theoretical and methodological basis for improving the paradigm of sustainable development of regional economic systems and regions. Groups of endogenous and exogenous factors of high-quality economic growth and their role in increasing the level of strategic sustainability of the Distribution Zone have been studied.*

Keywords: *strategic sustainability, regional economic system, socio-economic system, factors influencing the distribution zone.*

Maintaining and improving the positions of socio-economic systems (SES) in the hierarchy of the regional economic system (RES) are the most important tasks of restoration and ensuring its further sustainable development. SES of the region, on the one hand, are open dissipative systems capable of acting on the basis of self-organization and self-regulation, and on the other hand, they act as subsystems of the RES as an administrative-territorial entity. Regional economic systems of the national economy operate on a mesoeconomic basis level, and socio-economic systems within the RES are self-sufficient, “meso-” or “average” economic entities that occupy a special position between the macro- and microeconomic levels of the economy [1].

Modern scientists pay considerable attention to the theory of mesoeconomics and its place in the mainstream of economic theory. IN AND. Mayevsky raises the question of a serious shift in the creation of a fundamental mesoeconomic theory. G.B. Kleiner believes that “the center of economic space lies precisely in me-

soeconomics” [2]. The meso-level SES in the Donetsk People’s Republic includes the coal industry, metallurgy, energy supply, mechanical engineering, agriculture, culture and education, healthcare, etc., as well as economic regions and regions. The system-forming elements of the lower level of the distribution network hierarchy and specific socio-economic systems are enterprises focused on meeting the needs of society for the products of industries, on the strategic sustainability of which the effectiveness of the entire regional economic system depends.

The strategic sustainability of the SES as part of the region speaks about one of the cardinal directions of their functioning and fulfills the mission of the leading imperative in the paradigm of sustainable development of systems. Strategic sustainability as the most important organic component of the sustainable development of a system reflects its ability to restore and maintain the level of achieved reproductive potential after the cessation of the impact of external and internal factors of a destructive nature on it, as well as to return to a state of balanced, balanced and continuous qualitative evolution, ensuring further capacity building within paradigms for sustainable development of SES.

A generalization of the scientific provisions of a number of works devoted to the problems of the formation and effective implementation of SES strategies as part of a regional economic system made it possible to classify factors that influence the strategic sustainability of the RES and the region as a whole (Fig. 1).

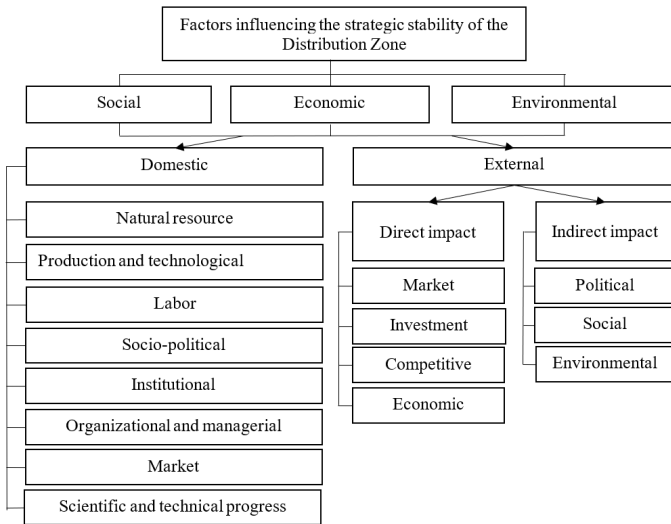


Figure 1. Key factors influencing the strategic sustainability of the distribution network [3]

Based on the fact that in the paradigm of sustainable development, which has currently received a significant impetus for development at the SES level, including the regional level, the triad “society economy - ecology” plays a key role, it is reasonable to agree with the opinion of scientists who identify three main groups of factors influence on the strategic sustainability of the Distribution Zone, namely: social, economic and environmental factors.

However, at the same time, the factors of the three groups from the standpoint of the regional strategizing process are divided into two categories - internal (endogenous) and external (exogenous), while the latter group represents extremely important factors of direct and indirect impact on the regional economic system. Endogenous factors are fundamental, since they include natural resource, labor, socio-political, institutional, organizational, managerial, market factors, or production resources that play a primary role in achieving the goals of strategic sustainability of business entities in the short, medium, and long-term time horizons of their activities.

The natural resource factor covers all elements of the natural environment that are located within the territory of the region, namely: climate, water resources, forests, lands, mineral resources, minerals and other components directly involved in the reproductive process of sustainable regional development.

Among the internal factors, the production and technological factor plays a key role, reflecting the general state of industry, agriculture and the service sector in the region. Achieving the goal of the necessary increase in production and raising the material standard of living of the population directly depends on the current state of production potential and strategic qualitative and quantitative changes in it due to the introduction of advanced technologies. Continuous improvement of production potential is a prerequisite for its permanent qualitative growth and one of the main factors in solving current socio-economic problems of regional economic systems.

Ensuring strategic sustainability as an imperative for the sustainable development of the Distribution Zone is unrealistic without taking into account the labor factor, which represents the state of human resources and human capital of the region, which has the ability to increase when applying a set of measures aimed at their training, development and effective use of human resources. By definition, labor (human) resources on a regional scale are a part of the working-age population that has the necessary physical health and knowledge to work in its economic systems, which includes men aged 16-59 years, women aged 16-54 years, as well as working citizens younger and older than this age. The importance of human capital for economic growth both at the stage of restoration of production, recovery from the crisis, and long-term growth cannot be overestimated. The role of qualitative characteristics of human capital, such as education, upbringing, culture,

morality, spirituality, the desire for continuous improvement, and the development of creative potential, is increasing. At the same time, quantitative indicators of the use of labor resources, for example, their number, indicators of recruitment and departure of personnel, etc., in models of economic growth for both developed and developing regions recede into the background.

External factors are drivers of influence on internal factors and, consequently, on the strategic stability of RESES, and this impact have varying degrees and different natures of influence (positive and negative). In this regard, factors of direct, or immediate influence of the economic environment surrounding the RES, and indirect factors, or factors of indirect influence on the system (“far field”) are distinguished. Both groups of factors must be taken into account when forming a strategy for the sustainable development of regional distribution zones, a necessary condition for ensuring which is strategic sustainability. The peculiarity of indirect factors is that they either contribute to or limit the realization of the potential integrated in direct factors. It should be noted that the differentiation of exogenous factors into direct and indirect is to some extent conditional, since the same factor in one case can be considered as a factor of direct influence, and in another case and under other conditions - as an indirect influence on the parameters of strategic stability of the Distribution Zone .

Exogenous factors of direct impact on the strategic sustainability of the regional distribution system include market, investment, competitive and economic factors that operate in its external environment. Among these factors influencing the strategic sustainability of the Distribution Zone in modern conditions of the economy entering the era of post-industrialism, the knowledge economy, active processes of informatization and digitalization of production, the innovation and investment factor plays a key role. The investment of capital, as well as its rational use in the highest priority sectors of knowledge and economics with the aim of not only making a profit, but also increasing public welfare, without violating the needs of future generations of people, is the foundation for the sustainable development of economic entities of various forms of ownership, distribution zones and the territory of the region in in general.

The competitive factor also has a significant impact on the strategic sustainability of the distribution zone, since the high competitiveness of the region is a consequence of the high level of its economic development and, first of all, production, in the process of which the latest technologies are successfully and consistently introduced. However, being a consequence of the development of the economy and, above all, production, competitiveness itself becomes the cause, driving force, or active driver of regional development.

Economic processes taking place both within the state and in the global economy cannot but influence the distribution network and its strategic stability, there-

fore, among the external factors of direct impact on the strategic stability of the distribution zone, it is necessary to highlight the economic factor as the dominant one. At the same time, a number of researchers consider the economic resource as an indirect impact factor, since it may include such components as: the state of the economy in foreign countries, the level of interest rates on deposits and credit products, the exchange rate, inflation rates and others related to macroeconomic factors or global economic factors. The state of the economy of foreign countries in a globalized world has a direct impact on the strategic stability of the state and its regions, and this impact can be positive and negative. In this case, the economic factor acts as an exogenous factor of direct impact. If, in particular, we evaluate the impact of the economic factor from the point of view of the level of interest rates on deposits, then it acts as an indirect impact factor. This is understandable, since the level of interest rates on deposits influences internal factors not directly, but through consumer demand [4].

Thus, despite the fact that indirect factors act indirectly, often through direct factors they have a great influence on the strategic stability of the RES. For example, the environmental factor indirectly affects the sustainability of the region's development through such direct impact factors as innovation, investment and competition. Investors, as a rule, give preference to the region in which the state of the environment is at a level favorable for life and business. In this case, environmentally friendly products produced in the region are more competitive compared to products that do not meet the requirements for greening production.

In conclusion, it should be noted that increasing the strategic sustainability of the Distribution Zone as a favorable prerequisite for the implementation of the principles and postulates of the sustainable development paradigm at the regional level is possible only if the strategic factors influencing the Distribution Zone and the region as a whole are diagnosed, analyzed, assessed and identified. The development of a scientific and methodological approach to studying the degree of their influence and developing ways to prevent the negative impact of exo- and endogenous factors on the level of socio-economic-ecological sustainable development requires the implementation and creation of tools for their adequate assessment for the effective use of methods and models of complex system analysis of factors in practice.

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俄罗斯联邦的缓刑作为预防累犯的基础
**PROBATION IN THE RUSSIAN FEDERATION AS A BASIS FOR
THE PREVENTION OF RECIDIVISM**

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抽象的。 文章探讨了刑满释放人员的适应问题,探讨了他们重新融入社会和重新社会化的问题。

关键词: 刑满释放人员、适应、适应不良、重新适应、重新社会化、重返社会、监狱后制度、缓刑。

Abstract. *The article examines the problems of adaptation of persons released from prison, examines the issues of their reintegration into society and re-socialization.*

Keywords: *persons released from prison, adaptation, maladaptation, readaptation, re-socialization, reintegration, post-penitentiary system, probation.*

The relevance of the topic under consideration is justified by the needs of society in the transformation of the post-penitentiary system, in particular, the need to develop new approaches in the work of all subjects of the prevention of recidivism.

Today, there is no doubt about the fact of the urgent need to consider a wide range of issues encountered in the practical activities of internal affairs bodies, and aimed at the prevention of recidivism and the adaptation of persons released from prison. This category of citizens is in special need of socio-psychological support, interacting with a set of measures of a legal, psychological and organizational nature. These individuals, perhaps more than anyone else, demonstrate all sorts of violations of social qualities and need their restoration for a full life in society.

The essence of the scientific approach to the problem under consideration is based on the close relationship of various areas of work with a pronounced interdisciplinary nature, allowing for the integrated application of theory and practice, smoothing out all sorts of contradictions between sciences. The currently existing mechanisms of socialization and adaptation, including psychological, of persons

released from prison, do not bring sufficient results, which is confirmed by the statistical information provided.

In 2022, out of the total number of crimes committed on the territory of the Russian Federation, every third was committed by a previously convicted person. Moreover, every second crime falls into the category of grave and especially grave.

In a number of constituent entities of the Russian Federation, there are regional legal acts on the resocialization of persons who have served a criminal sentence in the form of imprisonment, on job quotas or measures of economic incentives for employers employing citizens released from prison. Such indicators are insufficient for the existing number of persons in need of adaptation after release.

In order to solve these problems, at the direction of the President of the Russian Federation on the creation of a probation service, the Federal Law “On Probation in the Russian Federation” [1] was adopted in 2023, which came into force on January 1, 2024.

In accordance with the Federal Law, a probation institution is being created in the Russian Federation, providing for the implementation of executive, penitentiary or post-penitentiary probation in relation to convicts who find themselves in difficult life situations, persons who have been assigned other measures of a criminal legal nature, as well as persons released from serving sentences in the form of imprisonment or forced labor.

In order to correct social behavior, socialization, social adaptation and social rehabilitation of these persons, and prevent them from committing new crimes, it is envisaged to create conditions for providing assistance to these persons in matters of restoring social connections, obtaining education, employment, providing housing, exercising the rights to receive medical, psychological and legal assistance, social services, ensuring guarantees for the protection of human and civil rights and freedoms.

The Federal Law systematizes certain provisions of the legislation of the Russian Federation aimed at socialization, social adaptation and social rehabilitation of convicts and persons who have served their sentences, establishes uniform principles for the application of these provisions and the organization of work for their implementation. The subjects of probation, the legal and organizational basis of their activities in implementing probation, the procedure for their interaction with other government bodies and civil society institutions are determined.

An urgent issue is the creation of a new structure in the Russian Federation - a probation service, the main goal of which will be to help former prisoners adapt to normal life.

The range of listed problems in the field of reintegration of previously convicted persons into society demonstrates the urgent need to develop a psychological model of adaptation of these persons.

The issue of adaptation is of global importance, since human life without knowledge of the theoretical and practical foundations of the adaptation construct (an integral, separate entity of the world) is unthinkable. In the process of special development, a person faces constantly changing circumstances. This requires the development of more and more new ways of behavior, we have to abandon established concepts, break old attitudes and acquire new ones.

Certain issues related to the adaptation and re-adaptation of the individual to life in freedom were covered in the works of educational, legal, and penitentiary psychologists in the light of problems of socialization of the individual, the psychological essence of crime and punishment, the psychology of the criminal's personality and criminal behavior (I.S. Kon, M. V. Demin, N.P. Dubinina, B.S. Utevsky, Y.A. Alferov, A.V. Pishchelko, S.V. Baburin, A.F. Zelinsky, S.V. Poznyshv, L.A. Vysotina, S.A. Belicheva, A.I. Ushatkov, V.G. Deev, V.E. Eminov, M.I. Enikeev, Y.M. Antonyan and others). I agree with the opinion of researchers in the field of correctional psychology, in particular with M.I. Enikeev [2] that in the issues under consideration one cannot rely only on tightening the conditions of detention of prisoners and subsequent post-penitentiary control over those released from prison. The complex tasks facing both penal institutions and the territorial bodies of the Ministry of Internal Affairs of Russia, acting as subjects of crime prevention, lead to the need to search for ways related to the creation of conditions for the formation of adaptive behavior of an individual after serving a sentence. These tasks can be successfully solved only in a complex of programs: social, psychological-pedagogical, legal and organizational.

B.G. is recognized as the founder of an integrated approach in psychology. Ananyev [3], who developed a classification scheme for sciences in the direction of theoretical and practical human knowledge, outlined a number of problems in the comprehensive study of man. This approach to solving a number of pressing problems facing society significantly expands the possibilities of knowledge. In turn, we note that psychological science, not without reason, is forced to turn to the legal framework in the aspect outlined above. The reason is that socio-psychological measures for socialization, social adaptation and social rehabilitation of the category of persons under consideration must be combined with the tasks of respecting their rights and legitimate interests.

There is also an inverse relationship: the activities of law enforcement officers have special specifics and require possession of a set of psychological and pedagogical knowledge that helps to solve effectively assigned professional tasks.

In this regard, the adopted Law is aimed at addressing a certain range of problems in combating crime that accompany practical activities. The result of such a study, in our opinion, will be a more qualified provision of the necessary assistance to persons released from prison, which will help to prevent the problem of relapse of crimes much more effectively.

It should be noted that practice dictates the need for a scientific rethinking of the concept of adaptation and the closely related concepts of “socialization”, “readaptation”, “resocialization”, “maladjustment”.

Without understanding the essence of these categories, it is impossible to develop effective methodological and practical recommendations aimed at solving the tasks set for the probation system being created in the Russian Federation.

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供热合同制度
HEAT SUPPLY AND CONTRACT SYSTEM

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注解。 本文讨论了与俄罗斯现代供热系统相关的问题以及供热系统化问题。供热的系统化、集中化，从维护成本的角度考虑。

关键词：供热、债务、关税、消费者。

Annotation. *The article discusses issues related to the modern system of Russian heat supply, as well as issues of systematization of heat supply. Systematization and centralization of heat supplies, considered from the point of view of maintenance costs.*

Keywords: *heat supply, debt, tariff, consumer.*

The modern Russian heat supply system was created in the late 1930s. Considering the peculiarities of that time, we can say that most of the buildings were heated by heat from individual boiler houses. In turn, they functioned at the expense of oil or fuel oil.

The key point is the systematization of heat supply. Thus, the transition to urban thermal power plants (CHP) implied the presence of intra-block heating points that heated each apartment directly. This innovation was the next level in the development of the infrastructure of Soviet Russia.

The systematization and centralization of heat supplies gave the residents of the country the availability of hot water at any time of the year. However, it is worth noting the disadvantages of this practice: heat loss up to 90%. In parallel, questions arose about the provision of heating networks. Repair, quality control, regulation of fuel prices are the main issues.

In the Russian Federation, there are also problems in the district heating system – the “accumulated” debt” for the renovation of morally and physically outdated heating network infrastructure: companies cannot invest in the renewal of heating networks for at least 15 years, since the tariff includes only the current costs of maintaining the network.”

The latest legislative changes adopted in 2021 provide for an independent and voluntary transition of the subjects of the thermal energy market to its new model with the consent of the head of the municipality. “So far, no region has switched to a new method of tariff formation, work continues on by-laws. Nevertheless, in a number of regions we have started implementing our projects to modernize heat supply, the company has accumulated experience, has the opportunity and desire to invest in the development of the industry, if the return on investment is guaranteed,” says Ekaterina Kosogova, Director of Tariff Formation at SGK.

I would like to note that the tariff changes

According to the energy supply contract, the energy supplying organization undertakes to supply energy to the subscriber (consumer) through the connected network, and the subscriber undertakes to pay for the received energy, as well as to comply with the regime of its consumption provided for in the contract, to ensure the safety of operation of the energy networks under its jurisdiction and the serviceability of the devices and equipment used by it related to energy consumption.¹

When concluding a heat supply agreement, not only the special provisions of the law are applied, but also the general norms of the Civil Code of the Russian Federation on contractual work. These include provisions on essential conditions.

The unified heat supply organization and heat supply organizations that own heat energy sources and (or) heat networks in the heat supply system on the right of ownership or other legal basis are obliged to conclude contracts for the supply of heat energy (capacity) and (or) heat carrier in relation to the volume of heat load distributed in accordance with the heat supply scheme. A contract for the supply of thermal energy (capacity) and (or) a heat carrier is concluded in accordance with the procedure and on the conditions provided for by this Federal Law for heat supply contracts, taking into account the specifics established by the rules for the organization of heat supply approved by the Government of the Russian Federation.²

I would like to note that the place of fulfillment of the obligations of the contract is the delivery point, which is located on the border of the balance sheet of the heat-consuming installation.

¹ “ The Civil Code of the Russian Federation (Part Two)” dated 26.01.1996 N 14-FZ (ed. from 01.07.2021, with amendments. from 08.07.2021) (with amendments and additions, intro. effective from 01.01.2022)

² Federal Law No. 190-FZ of 27.07.2010 (as amended on 01.05.2022) “On Heat supply”

Federal Law No. 190 of 27.07.2010 “On Heat Supply” contains the concept of an ownerless heat supply facility. Thus, according to paragraph 6 of article 15 of this federal law, if an ownerless object is detected within 60 days, the municipal authority is obliged to ensure that the compliance of the ownerless heat supply object with safety requirements is checked. In the future, the municipality puts the object on the register. A year later, the body authorized to manage municipal property may apply to the court with a demand for recognition of the right of municipal ownership of this object.

In relation to ownerless heating networks, an exclusive procedure for determining the organization that carries out the maintenance and maintenance of such networks before the recognition of ownership of them has already been established. The rules are specified in Part 6 of the cta

- minutes of the general meeting of the owners of premises in the MCD, at which it was decided to choose a management organization as a management method;
- minutes of the general meeting at which a decision was made on the selection of a management organization represented by the management organization that applies to the RSO;
- the contract of management of the MCD, if it is concluded.

If the resource supply contract specifies the qualitative and quantitative indicators of the supplied heat, it should be noted that the UO should be able to ensure the proper maintenance of the common property in the MCD and provide a utility service that will meet all requirements (paragraph 20 of RF PP No. 124 of 02/14/2012). It is worth noting that the cost of the resource itself, in our case – heat, will be calculated according to the tariffs that are established by the legislation of the Russian Federation (paragraph 22 of the RF PP No. 124 of 02/14/2012).

If any surcharges are set to the tariffs, then they should also be taken into account when calculating the cost of the Kyrgyz Republic.

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国际仲裁裁决对非当事人的约束力
**BINDING NATURE OF INTERNATIONAL ARBITRAL AWARDS
FOR NON-PARTIES TO THE CASE**

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The peculiarity of the principle of binding international judicial decisions is the relative nature of its effect, limited by its influence only on the parties to the judicial process. In other words, the court decision binds only the immediate parties to the case without extending to third parties. At the same time, this principle does not cancel the *res judicata* rule regarding a binding judicial decision against a State or States participating in a judicial process, since the system of the Permanent Court of Arbitration allows interference if the subject of the dispute is the interpretation of a multilateral treaty.

Article 84 of the 1907 Hague Convention for the Pacific Settlement of International Disputes states: “When it comes to the interpretation of the convention, in which other Powers participated, except for the disputing Parties, these latter promptly warn all the signatory Powers. Each of these Powers has the right to join the cause. If one or more of them exercise this right, the interpretation of the Convention contained in the arbitral award will be equally binding on them¹.”

Thus, if the issue before the arbitral court concerns the interpretation of a decision to which the States parties to the case are not direct, they must interfere in the proceedings, and if they do not interfere on their own initiative, the court should immediately notify them of the need to interfere.

Any subject of international law, either State or international organization, in accordance with the terms and conditions defined by the general rules of international arbitration, may apply to the court to allow it to interfere in the dispute if it considers that it has a legal interest that may impact the decision on the case.

¹ 1907 Convention for the Pacific Settlement of International Disputes (Adopted in the Hague, the Netherlands on 18 October 1907) // URL: <https://cil.nus.edu.sg/wp-content/uploads/2017/07/1907-The-Hague-Convention-for-the-Pacific-Settlement-of-International-Disputes-1.pdf> (date of access: 13.02.2024).

In accordance with the interference regime, the purpose of the interfering State should be to protect its rights and interests during the proceedings in court. The goals that it pursues should be clear, legitimate and relate to the subject of the dispute considered by the court. In addition, there should be a form of consent between the interfering State and the direct parties to the dispute to interfere that would be also considered by the court.

The report of the 1930 Hague Conference on the Codification of International Law have stated that one may wish to assert its own rights or express its opinion that one of the disputing States does not have the right to what it claims and that therefore, the application filed by the interfering State should be forthcoming arbitral award, the purpose of the interference and any objective basis that, in its opinion, exists between the interfering State and the direct parties to the case².

However, the fulfillment of these conditions alone is not enough for the right to interfere since this right is initiated only by a court decision, and therefore the court has the right to reject an application for interference if it affects illegal purposes.

It can be said that the burden of proving the existence of an interest in the case of interference lies with the mediator country but in the case of an application for admission, the interest is summarized. When a State is willing to interfere in a case, there should be a convincing presumption in its favor or proof that it has a legitimate interest.

Interference should be also related to a claim already pending in court, and if the initial decision on the claim had been made earlier, interference is not allowed, since interference is considered an interim procedure in the case, and therefore the request for interference should be directed to an existing claim.

If the State exercises its right to interfere in the case and the court satisfies it, then the interfering State becomes bound by the judicial decision rendered on the merits of the trial, equally with the original parties to the proceedings.

This is due to the fact that the State, after the interference procedures are completed, loses its status of a “non-party to the dispute”, thus becoming the party to the judicial process and using its following rights provided for the original parties to the dispute and observing the obligations imposed on them. Thus, it becomes obvious that the acquisition of rights and the assumption of obligations by the interfering State is not considered as the extension of a court decision to non-parties to the dispute, but the operation of the principle of consent, which underlies the arbitration process.

² Acts of the Conference for the Codification of International Law. Vol. I. Plenary Meetings (held at the Hague from March 13th to April 14th, 1930) // URL: https://icsid.worldbank.org/sites/default/files/parties_publications/C8394/Claimants%27%20documents/CL%20-%20Exhibits/CL-0236.pdf (date of access: 13.02.2024).

Accordingly, a decision binding on the States participating in the arbitration process is not a derogation or exception to the principle of *res judicata*.

In case of interpretation of ambiguous legal texts, given that the jurisdiction of the arbitration court is based on the principle of consent, the court makes a decision on this case, which applies exclusively to the States parties to the dispute.

There is an opinion that the decision of the International Court of Justice may bind other parties that are not direct participants in the judicial proceedings, even if they do not interfere in it, for example, when it comes to territory or any tangible object, which, in other words, concerns a material situation.

However, it is difficult to judge the correctness of this position, since in the case of the obligation of third parties to respect the content of a legal agreement that establishes the permanent legal positions of subjects, it becomes obvious that the basis of this obligation is not the provision itself, but a general legal custom obliging all members of the international community to respect the actual territorial sovereignty and international stability. The international community consists of sovereign legally equal States, and, accordingly, it would be unacceptable if this provision were extended to non-parties against their own will.

Recognizing the existence of the rule of relative validity of treaties, its consolidation in international relations and its clear codification in article 34 of the 1969 Vienna Convention on the Law of Treaties³, there are exceptional (albeit rare) cases when treaties establish rights for other parties and impose obligations on them (in some cases without their consent). For example, paragraph 6 of Article 2 of the UN Charter, which ensures that non-member States comply with its principles in order to maintain international peace and security⁴. This paragraph coordinates with paragraph 4 of Article 2, which obliges Member States to refrain from the threat or use of force, which is quite logical, because otherwise it will be enough if at least one State (regardless of whether it is a Member of the United Nations or not) decides not to obey the principles of the Organization on refraining from the use of force to destroy the entire legal structure of the Charter and jeopardize the goals and objectives of the Organization for the preservation of international peace and security.

Accordingly, the principle of obligation for third parties to the clauses of an international arbitration award has a legal basis in the interests of the international community, which means that the obligation of States that are not parties to the

³ Vienna Convention on the Law of Treaties between States and International Organizations or between International Organizations (Done at Vienna on 21 March 1986) // URL: https://legal.un.org/ilc/texts/instruments/english/conventions/1_2_1986.pdf (date of access: 13.02.2024).

⁴ Charter of the United Nations and Statute of the International Court of Justice (Adopted in San Francisco in 1945) // URL: <https://treaties.un.org/doc/publication/ctc/uncharter.pdf> (date of access: 13.02.2024).

treaty to respect the ideas contained in the treaty is in the international public interest.

Thus, summarizing all of the above, it can be concluded that, strictly speaking, the binding nature of an international arbitral award applies exclusively to the direct parties to the arbitration process and, as it was shown in this article, in the case of a party that is not initially a party to the case, the obligation to comply with the decision occurs only if the court approves its interference in the case based on a proven legal interest. It should be emphasized that in this kind of situation, the third party loses its initial status and becomes a direct participant in the process on an equal basis with other parties. As it was found out in this article, a special case is the UN Charter, which obliges all states, regardless of their membership in the Organization, to respect the principles of the Charter and not to use force in order to preserve international peace, stability and security.

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欺凌行为是影响少年犯人格形成的因素之一
**BULLYING AS ONE OF THE FACTORS INFLUENCING THE
FORMATION OF THE PERSONALITY OF A JUVENILE
OFFENDER**

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概括。欺凌是一种在世界各地普遍存在的现象。它可以在儿童群体和成人中表现出来。然而，校园欺凌对人格形成造成严重后果，包括对青少年犯罪者的人格形成。从心理学的角度来看，它对受害者和攻击者以及观察者或“沉默的人”产生负面影响。在极端情况下，欺凌的“受害者”本身就变成了“侵略者”。

欺凌问题必须在法律框架内考虑。意识到欺凌和网络欺凌后果可能受到的惩罚可以阻止所有欺凌参与者。

关键词：欺凌、网络欺凌、未成年人、青少年、犯罪。

Summary. *Bullying is a phenomenon widespread all over the world. It can manifest itself both in children's groups and in adults. However, it is school bullying that has serious consequences in the formation of a personality, including that of a juvenile delinquent. From the point of view of psychology, it negatively affects the victim and the aggressor, as well as observers or "silent people". In extreme cases, the "victim" of bullying itself becomes the "aggressor".*

The issue of bullying must be considered within the framework of the law. Awareness of the possible punishment for the consequences of bullying and cyberbullying can stop all participants in bullying.

Keywords: *bullying, cyberbullying, minor, teenager, criminal.*

Bullying (from English bullying - intimidation, mockery) is not a new phenomenon. For centuries, a person or group of people has, in one way or another, shown violence, bullying and aggression to those whom they considered weaker and unable to defend themselves. However, only in the middle of the 20th century did bullying acquire clearer formulations and began to manifest itself among teenagers in more aggressive forms, and therefore it was recognized as a serious problem in the development of children in society.

The founders of the theory of bullying were Scandinavian scientists D. Olweus, A. Pikas and P. Heinemann, who first studied the phenomenon of bullying among boys in the 70sXX century. Dan Olweus first spoke about bullying in his book “Bullying at School,” where he outlined the concept of bullying and the reasons for its occurrence. The author understands bullying “as a special type of violence when one person (or group) physically attacks or threatens another person (group), the latter of whom is weaker and cannot defend himself either physically or morally” [8].

I.N. Kohn interprets bullying as “intimidation, physical or emotional terror, with the goal of showing fear in the victim and thereby subjugating him to oneself” [5].

D. Lane understands the phenomenon of bullying as “school bullying” and believes that “bullying is long-term physical or mental violence by an individual or group against an individual who does not have the opportunity to defend himself in a certain situation” [6].

In Russia, A. Makarenko, I. Berdyshev, S.V. studied bullying. Krivtsova, psychologists and teachers of Russian world culture.

I. Berdyshev understands bullying as “conscious, prolonged violence that has no signs of self-defense and comes from a certain number of people” [1].

All authors agree on one thing: bullying is violence. However, this is not just violence, but one of its types. The most optimal definition in our case is given by S.V. Krivtsova, who says that “bullying is the aggression of some children against others when there is an inequality of power between the aggressor and the victim; aggression tends to be repeated, with the victim’s response showing how much he is affected by what is happening” [6].

The risk of bullying manifests itself in adolescents. A restructuring of not only the entire body, but also the psychological thinking of the minor this period of a child’s growing up that is characterizes it. Teenagers often experience anxiety, irritability and aggression. Being unsure of them, but at the same time constantly striving for leadership, perceiving the world as black and white, teenagers disenate themselves. The beliefs of childhood, the norms and rules of youth differ from the behavior of adults. A minor “adult” has a desire to prove his superiority over the world, which invariably leads to aggression, since in most cases the teenager still does not have enough moral and volitional qualities and psychological attitudes to overcome himself, flexibility in communication, and knowledge. The “law of the pack” is triggered - “the strongest survive: either you, or you.”

D. Olweus remains one of the most authoritative and significant scientists in the study of bullying today. Analyzing that “bullying is a type of violence and can be expressed in various ways,” he defines in more detail the following types of bullying:

- verbal bullying;
- bullying aimed at social exclusion or isolation;
- physical bullying;
- bullying through lies or false rumors about the victim;
- aggression: taking away money or other things, damaging them by bullying;
- threats or coercion to perform any actions;
- racist bullying, etc. [3].

D. Lane divides bullying into physical and mental violence [7]. I. Berdyshev distinguishes verbal, behavioral and actually aggressive types of bullying, with physical violence [1].

Bullying is a social process that involves three behavioral patterns: the victim, the aggressor(s), and the bystanders. They also correspond to such forms of deviant behavior as victimized, aggressive and conformist [4]. Let us look at these models in more detail.

Victim.

The victims of bullying are usually those who cannot stand up for themselves and at the same time have various prerequisites for bullying, such as:

1. Developmental features, appearance defects
2. Physical weakness (short height, excess weight)
3. High or low grades (such teenagers can become victims of bullying not only from peers, but also from teachers).
4. Family poverty, low social status of parents, presence of bad habits (alcoholism, drug addiction), one of the parents being in prison.
5. Closedness, shyness, self-doubt, naivety.
6. Lack of mutual understanding with parents.

Teenagers who are systematically bullied by their peers feel insecure, are constantly in tension, expecting an attack, both physical and moral, feel like outcasts, and withdraw into themselves. In such children, their academic performance decreases, the child begins to miss classes without a good reason, and becomes lacking in initiative.

It is this uncertainty that can lead to retaliatory aggression. Sometimes this aggression takes a global form. The teenager is thinking through his revenge, preparing to strike not only his offender, but also those around him, accusing them of failing to protect him from bullying and bullying.

However, today we can conclude that a normal person can become a “victim” of bullying. The victim is chosen among those “unlike” other people. In a closed community, which any educational organization belongs to, there is practically no way out of bullying. To resolve the issue, the help of adults, primarily legal representatives, is required, but even here the teenager often faces misunderstanding and indifference on the part of elders. And even more understands that responding to bullying with aggression is the only way out of this situation.

This is how the future minor “victim-criminal” appears.

Aggressor.

“For a long time, there was an opinion among researchers on the topic of bullying that only people with low self-esteem, children from disadvantaged families who cannot control their emotions, can become aggressors. However, then it became clear that among bullies there are very often individuals with high self-esteem and high emotional intelligence, who know how to behave adequately when circumstances require it, but in the absence of the threat of punishment, they are prone to aggression.

Bullies not only have excellent control over their emotions, but also skillfully manipulate the feelings of others. Often the motives of persecutors are the thirst for power and status, moral and material satisfaction. Sometimes even the slightest reaction of approval from bystanders (a smile, laughter, verbal encouragement) can become a reward for bullies.” [2]

Rarely, aggressors or bullies are aware of their behavior, evaluate it from the point of view of legality and norms of behavior in society, moral values, and therefore stop bullying the victim. But in most cases, the bully only stops the bullying temporarily. This happens mainly when a new victim appears, or when the “old” victim fights back, or simply leaves the environment of the aggressor.

A teenager who is constantly in a state of aggression does not try to change himself, considering this behavior to be the norm. In the future, such behavior may lead the minor to prison or to special closed institutions, where the minor “bully-criminal” himself will turn into a victim of bullying.

“The most negative impact of constant bullying is realized in the formation of an asocial (not corresponding to generally accepted rules of behavior and actions in society) personality of a teenager. Constant violence, humiliation, and mockery creates a hidden feeling of hatred, hostility and aggression, and causes a desire to take revenge. The offender (the so-called buller), with the systematic conscious humiliation of the victim, develops a persistent feeling of permissiveness and impunity. He quickly loses his understanding of the legality and illegality of his actions, since the punishment either does not come at all or is completely insignificant” [9].

Observer.

In an educational organization, most children are observers or “silent ones.” It is with their quiet consent, and sometimes even silence, that the worst abuses occur. Witnesses of bullying often feel fear and helplessness in the face of violence, even if it is not directly directed at them. They may feel guilty for not standing up or, in some cases, for joining in the bullying. However, few observers are able to stand up for the victim or stop the aggressor.

But the “silent” observer himself is exposed to daily stress, is psychologically dependent on the aggressor or group of aggressors, thus, observing injustice and

not having the moral qualities to help the victim, he himself turns into a “silent” aggressor. When such a teenager grows up, a heightened sense of justice or injustice may push the observer to commit crimes or offenses “for the good.” A minor “criminal-silent” carries even more aggression than a “aggressor-criminal”, because the aggression of a “silent” has a cumulative effect and can manifest itself after a large amount of time.

Bullying is a problem that should be discussed in society and prevented. The family environment, attitudes instilled in childhood, parental behavior patterns, and the microclimate in an educational institution, facilitates the development of bullying.

No matter how strange it may sound, the main role in bullying is assigned to the observer (“the silent one”). Therefore, when working with a team in an educational organization, it is necessary, first, to establish contact with a group of “silent people”, to help them understand that the process of stopping bullying and bullying depends on them, when the aggressor sees and hears that the team does not support him, that “victims”, defenders appear, then he retreats.

In modern conditions, such a type of bullying as cyberbullying is developing. This form of bullying has become relevant in connection with the development of information and telecommunication technologies. The concept of cyberbullying in our country has no clear boundaries at all. It is very difficult to combat this phenomenon, primarily because the cyber aggressor is hidden on the Internet or his identity is unknown.

To solve such a complex problem, it is necessary to introduce the concept of bullying and cyberbullying at the legislative level, as well as establish the degree of responsibility.

An interesting question is about measures to combat cyberbullying at the legislative level in Western countries, since this problem also occurs in the world community. For example,

In the People’s Republic of China (PRC), in October 2023, Chinese Prime Minister Li Qiang signed an order of the State Council on a set of rules for the protection of minors in cyberspace; the regulatory document came into force on January 1, 2024. These rules are aimed at regulating a healthy Internet environment and are addressed primarily to developers of online platforms where the majority of the audience is minors.

Developing mechanisms to regulate operations in cyberspace is complex. However, taking into account the experience of colleagues from the PRC, efforts should be directed towards creating a healthy Internet environment for minors; developers of platforms with a target audience of minors should promptly develop ways to protect teenagers from unwanted content and create ways to filter incoming information and when working in the Internet space, “create and improve mechanisms for early warning, detection and response to cyberbullying.”[10]

The issue of bullying must be addressed within the framework of the law. There is no such concept as “bullying” in Russian legislation. There are no measures to attract an aggressor or an observer – a “silent one” – specifically for bullying. Possible consequences occur for the bully only if the victim suffers physically (beatings, causing varying degrees of harm to health, death or suicide of the victim) or morally (insults, dissemination of deliberately false information). Awareness of the possible punishment for the consequences of bullying and cyberbullying can stop all participants in bullying.

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老年妇女综合康复

COMPREHENSIVE REHABILITATION OF ELDERLY WOMEN

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注解。 本文介绍了为患有认知障碍的老年妇女组织和开展适应性体育课程的积极经验。 作者评估了患有一级痴呆的老年女性的心率和呼吸运动、血压、腕部测力等指标，计算了希尔德布兰特指数。 研究表明，定期进行专门组织的体育锻炼对老年妇女的生活质量产生积极影响，对其健康产生有益影响。 经过两个月的定期训练，女性手部屈肌的力量有所增加，系统间（心肺）比率保持正常。

因此，利用适应性体育锻炼的复杂康复是最容易实现和最有前途的领域之一，因为定期体育锻炼可以提高患有一级痴呆症的老年妇女的独立生活和适应能力。 获得的结果可用于制定旨在维持老年人健康和身体活动的康复计划。

关键词：适应性体育文化，老年，痴呆，复杂康复。

Annotation. *The article presents the positive experience of organizing and conducting adaptive physical education classes with elderly women with cognitive impairments. The authors evaluated the indicators of heart rate and respiratory movements, blood pressure, wrist dynamometry, calculated the Hildebrandt index of senile women with first grade dementia. The study showed that regular physical exercises in specially organized groups have a positive impact on the quality of life of women of senile age, have a beneficial effect on their health. After regular training for two months, the strength of the flexor muscles of the hand in women increased, intersystem (cardiorespiratory) ratios remained normal.*

Thus, complex rehabilitation, using adaptive physical culture, is one of the most accessible and promising areas, since regular physical exercises improve the ability to independent living and adaptation of senile women with dementia of the first degree. The results obtained can be useful in the development of rehabilitation programs aimed at maintaining the health and physical activity of senile people.

Keywords: *adaptive physical culture, senile age, dementia, complex rehabilitation.*

Relevance. According to Rosstat, in 2018, out of 146.7 million people in the Russian Federation, one in four (37.9 million people) was older than able-bodied. According to the forecasts of the World Health Organization (WHO), it is expected that by 2050 the world population over 60 years will exceed two billion. Thus, the elderly will make up 22% of the world's population. Experts note that along with an increase in life expectancy, the elderly have an increase in non-communicable diseases [2, 8], including dementia [4].

According to experts of various levels, dementia is one of the most serious social problems of the XXI century, which needs to be addressed at the international, national and local levels, as well as at the level of families and individuals [1].

According to WHO estimates, more than 55 million people suffer from dementia (8.1% of women and 5.4% of men over the age of 65). It is expected that by 2030 this figure will grow to 78 million, and by 2050 to 139 million [4].

In their work, A.G. Solovyov, I.A. Novikova, V.V. Mestechko define dementia as a persistent decrease in human cognitive activity, as well as the loss of previously acquired knowledge and acquired skills. Based on data from the World Health Organization, the authors indicate that up to 35.6 million people suffer from dementia, and this number is projected to double by 2030. In Russia, almost two million elderly people suffer from dementia [5].

Dementia is a syndrome, usually chronic or progressive, in which cognitive function (i.e. the ability to think) degrades to a greater extent than is expected with normal aging. There is a degradation of memory, thinking, understanding, speech and the ability to navigate, count, learn and reason. Dementia has no effect on consciousness. Cognitive impairment is often accompanied, and sometimes preceded, by deterioration of control over the emotional state, as well as degradation of social behavior or motivation [6].

In this regard, research aimed at finding optimal solutions to this problem should be comprehensive and especially they become relevant for women of senile age with dementia of the first degree.

The aim of the study was to improve the functional state of senile women with grade I dementia through a complex of adaptive physical culture.

Materials and methods. The work was carried out on the basis of the Regional state budgetary institution of social services "Integrated Center for social services of the population "Leninsky" of the city of Krasnoyarsk. Where, after a comprehensive assessment of cognitive functions by a psychologist from the recipients of services, groups are formed (the number in such groups is 4-6 engaged), taking into account the degree of cognitive impairment. Rehabilitation activities are car-

ried out in courses lasting 42 working days with the involvement of a specialist in complex rehabilitation, an instructor of adaptive physical culture (APC), an occupational therapist, a cultural organizer, a psychologist. In this article we will present a fragment of complex rehabilitation. The study involved women ($n = 4$) with grade 1 dementia, whose average age was 79.5 years. It should be noted that 75% of the subjects in the morning took medications that stabilize the functional state as prescribed by a doctor.

The main research methods were the analysis of scientific and methodological literature, testing of the functional state (heart rate and respiratory movements, blood pressure, the Hildebrant index was calculated) [3, 7], methods of mathematical statistics. To measure the strength of the flexor muscles of the hand, we used a manual dynamometer (DRP-30) corresponding to the capabilities of the subjects. Measurements were carried out three times on the right and left hand with a rest of 40-60 seconds in a standing position freely. The subject squeezed the dynamometer, moving his arm slightly forward and to the side, without bending it at the elbow joint. The best result was recorded.

The results of the study. Analysis of the physical and functional state of senile women with grade I dementia revealed that the average body weight was 63 ± 3.1 kg, body length was 166.75 ± 3.4 cm, the average systolic blood pressure in the subjects was 128.75 ± 8.5 mmHg, diastolic pressure was 88.25 ± 6.6 mmHg. The average respiratory rate was recorded 23.75 ± 1.4 cols per minute. The average heart rate was 74.75 ± 6 beats per minute. The average strength of the flexor muscles of the right hand was set at 19.7 ± 3.4 kg, the left - 17 ± 2.8 kg, which is very low. We also calculated the coefficients of variation of each studied trait, indicating a strong variability ($V=24.6 - 27.9\%$) of indicators in the examined group.

Based on the data of scientific and methodological literature, regulatory documents and the results of the analysis of the physical and functional state of senile women with dementia of the first degree, a complex of adaptive physical culture was developed.

Adaptive physical education classes for senile women with first grade dementia were built in compliance with the principles of accessibility and individualization, with the predominance of the complex application of various physical exercises. A distinctive feature of such classes was that the loads lose their general tendency to increase, they periodically change in shape, but retain a stabilizing orientation and do not cause visible fatigue. The specific weight of the new material to be assimilated is decreasing. The main task was to improve the functional state of senile women with first grade dementia.

Classes were conducted in a group method, in the morning twice a week with a strictly individual approach to each student. The duration of classes in the initial period did not exceed 30 minutes, over time the duration of classes increased to 40 minutes, a total of 16 classes were held during the rehabilitation period.

In the preparatory part of the lesson, exercises of articular gymnastics aimed at increasing the mobility of the elbow, shoulder and knee joints were used. The exercises were performed in a sitting position on a chair. At the end of the warm-up, one of the exercises of finger gymnastics with various variations was used. For example, the thumb with the pad up. The task is to touch it as quickly as possible with all the other fingers, starting with the “thumb – index” combination, etc. To complicate this option, we perform a movement with the “thumb – index” with the right hand, and the “thumb – little finger” with the left.

The main part of the lesson was aimed at strengthening the muscular corset, developing coordination and strength abilities. At the beginning of the course, exercises were performed only sitting down, exercises with objects for different muscle groups were simulated, the number of exercises per lesson was no more than three. As transitional moments between more intensive exercises, elements of respiratory, finger gymnastics were used, stimulating cerebral circulation through the development of fine motor skills. From the second week of classes, they began to use exercises from a standing position with support on the back of a chair: lifting on socks, half-squats at a slow pace, leaning forward, exercises of vestibular coordination training. Next, exercises with a gymnastic stick and a ball were added. It should be borne in mind that for senile women with grade I dementia, ball exercises are difficult, require more time to learn and master. Exercises were used: throwing the ball up and catching with one hand alternately left, right; throwing the ball up, performing a clap and catching the ball. It should be noted that at the initial stage of rehabilitation, it is difficult for women to switch their attention, they do not catch the ball well and hardly work in pairs, all this causes excitement and rapid fatigue.

In the final part of the lesson, very carefully and slowly performed stretching exercises for those muscles that worked. Articulation exercises, self-massage of the head and shoulder girdle using a massage ball, as well as a set of exercises of gymnastics for the eyes were necessarily performed.

The effectiveness of the adaptive physical culture complex used was evaluated by repeated measurements of wrist dynamometry, evaluation of the Hildebrandt index at the end of the rehabilitation course. The average Q index was 3.09 and indicates normal intersystem (cardiorespiratory) ratios. There was an actual improvement in the average indicators of the strength of the right hand by 1.8 kg (the average was recorded as 21.5 ± 3.1 kg), the left hand by 0.75 kg (the average was 17.75 ± 3.4 kg) during the rehabilitation of elderly women with first grade dementia.

Conclusion. The study showed that regular physical exercises in specially organized groups have a positive impact on the quality of life of women of senile age, have a beneficial effect on the health of those involved. After regular training

for two months, the strength of the flexor muscles of the hand in women increased, intersystem (cardiorespiratory) ratios remained normal.

Thus, complex rehabilitation, using adaptive physical culture, is one of the most accessible and promising areas, since regular physical exercises improve the ability to independent living and adaptation of senile women with dementia of the first degree. The results obtained can be useful in the development of rehabilitation programs aimed at maintaining the health and physical activity of senile people.

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未来学前和小学教师对教育知识的价值观态度的形成
**FORMATION OF A VALUE-BASED ATTITUDE TO
PEDAGOGICAL KNOWLEDGE AMONG FUTURE TEACHERS OF
PRESCHOOL AND PRIMARY EDUCATION**

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抽象的。未来学前教育和小学教育学中对教育学知识的价值态度形成问题已成为现实。人们的注意力集中在以更有效的形式组织学生的课内和课外活动,以形成对教学知识的价值态度。

关键词: 未来教育家、价值态度、教育知识。

Abstract. *The problem of formation of value attitude to pedagogical knowledge in future pedagogies of preschool and primary education has been actualized. The attention has been concentrated on more effective forms of organizing curricular and extracurricular activities with students on the formation of value attitude to pedagogical knowledge.*

Keywords: *future pedagogues, value attitude, pedagogical knowledge.*

At all times, pedagogical activity has been essential in preserving, enhancing and transmitting culture to subsequent generations. The most important part of culture is knowledge, carefully transmitted by teachers to students, which serves as the basis for the formation of their methods of activity, life experience, creative solutions to various problems, moral behavior, etc. However, the development of humanity is accompanied by a continuous increase in the volume of knowledge, which today includes 25 million conventional books (one conventional book is equal in volume of knowledge to a book, which, when digitized, will contain a volume of information of 1 MB), and the growth rate of knowledge is 2,2% per year. As V.D. emphasizes Orekhov, this knowledge carries great value and determines human productivity; on average, each conventional book should generate GDP of more than \$3 million per year. The scientist notes that the increase in knowledge is so rapid that specialists do not always have time to master it and make it a productive force [1]. Of course, this also applies to the sphere of pedagogical activity, for

which it is extremely important to “feed” on the knowledge of various sciences, which will allow the teacher to increase the efficiency of the process of education, training and personal development of the student, who is the most complex and invaluable creature on earth (V.A. Sukhomlinsky).

The problem of developing a value-based attitude towards knowledge among future specialists is reflected in the studies of such scientists as O.N. Akinshina, E.S. Arishina, N.M. Burtseva, M.A. Cave, T.M. Pilipishko, V.I. Terentyeva, O.P. Filatova and others. However, the aspect of the formation of a value attitude towards pedagogical knowledge among future teachers of preschool and primary education is insufficiently studied, which was the purpose of our article.

Let us clarify the essence of the concept of “value relationship”, which includes such components as “value” and “attitude”. In the pedagogical dictionary, “value” is defined as the positive or negative significance of objects in the surrounding world for a person, a social group, or society as a whole, determined by their involvement in the sphere of human life, interests and needs [2]. The world of values is quite extensive, covering all aspects of human existence, which, of course, affected their classification. In our study we will rely on the classification proposed by V.A. Karakovsky, who identified eight high-level values, which, from the researcher’s perspective, are fundamental in organizing the process of personal education: the earth is the common home of humanity; Fatherland; family; labor is the basis of human existence; knowledge; culture as the great wealth of humanity; peace on earth; man as an absolute value, goal and result of education [3].

From the point of view of N.E. Shchurkova, the most important task of a teacher as a representative of the culture of humanity, despite the diversity of material and spiritual values, is to create conditions specifically for the formation of higher values, i.e. a value attitude towards them, manifested in a stable selective preferential connection between the subject and an object in the surrounding world, when the selected object acquires a personal meaning for the subject and is regarded by him as something significant [4].

M.A. Cave defines students’ value attitude towards subject knowledge as a positive conscious attitude towards it, manifested in deep cognitive interest and the ability to assess its importance in professional training. If cognitive interest acts for a future specialist as an individual value of academic disciplines and is associated with his personal meaning, then the professional significance of disciplines is a socially determined value for a student, necessary for obtaining an education and carrying out professional activities [5].

A condition for the effective organization of the process of forming students’ value attitude towards educational and cognitive activities, as shown by the study by O.N. Akinshina, is to fill the content of disciplines with knowledge that can affect the value-semantic core of the future specialist’s personality, as well as the

use of appropriate teaching methods that make it possible to rely on the subjective experience of students in solving various problems, to consider and analyze certain phenomena of the surrounding reality and to find personal meanings, values, interests for professional growth. According to O.N. Akinshina, the process of forming the value attitude of students to educational and cognitive activities is the most important mechanism of their professional and personal development, in which each student has the opportunity to realize himself through productive activities, satisfy the need for knowledge in accordance with his potential capabilities, interests and value orientations [6].

An important task of preschool education is the development of cognitive interests, curiosity and cognitive motivation of the child. The development in a preschooler of the need to understand the world in all its diversity is the basis of his meaningful learning in primary school, a condition for high-quality assimilation of the knowledge system at subsequent levels of education and successful social integration in the rapidly changing conditions of modern society. Only a teacher who himself feels the need to continuously replenish his personal pedagogical treasury with knowledge that will contribute to both his professional and personal growth and the education of the younger generation can ignite a student's thirst for knowledge. Such a teacher, as a rule, conducts unconventional classes and lessons, he is interesting to children and their parents, and they see him as an example to follow and try to responsibly carry out the tasks of a teacher they respect.

To develop such teachers, appropriate professional training in a university setting is also necessary. From our point of view, the core of the knowledge system of future teachers is precisely pedagogical knowledge as one of the high-level values (according to V.A. Karakovsky). It is the value attitude towards this knowledge that determines the effectiveness of the education process of the future specialist and the emergence of his need to increase knowledge from other fields of science, the integration of which will allow him to fulfill adequately the pedagogical mission.

By a value-based attitude to pedagogical knowledge, we mean the manifestation in future specialists of a persistent conscious interest in the results of knowledge of phenomena, events, facts, processes, objects, subjects associated with the formation of a comprehensive and harmoniously developed personality; the ability to react emotionally to the content of pedagogical disciplines; find values and meanings in pedagogical knowledge that motivate the future teacher for continuous improvement and expansion of pedagogical knowledge.

At the Taras Shevchenko Lugansk National University in the direction of "Pedagogical Education" (profiles "Pre-school education", "Primary education"), significant attention is paid both in the process of classroom and extracurricular work with students to the formation of a value attitude to pedagogical knowledge.

First, teachers try to conduct lectures on pedagogical disciplines using the latest achievements of pedagogical science, as well as the results of their scientific research, thereby being an example of professional restlessness in mastering pedagogical knowledge. In classes in the disciplines “Pedagogy”, “Fundamentals of Preschool Education”, “History of Pedagogy”, “Family Pedagogy”, “Pedagogical Skills”, etc., the significance of the content of each topic discussed is revealed, leading students to an independent search for values and meanings in pedagogical knowledge. The most effective forms of organizing practical classes with future teachers have been identified: round-table seminars, seminar-meetings, scientific and practical seminars, press conferences. Extracurricular activities make it possible to expand the possibilities of classroom activities, to involve future teachers of preschool and primary education in a variety of non-standard forms of organizing the educational process in higher education.

We focus on the possibilities of round table seminars that we successfully implement in pedagogical disciplines. As a rule, we offer seminar topics in accordance with the content of the programs of pedagogical disciplines, where students have the opportunity to discuss various topical issues of preschool and primary education, express their position, ideas for solving the problem, enter into dialogue with an opponent and identify the rational grain in pedagogical knowledge. Of course, the interactive form of work with students significantly increases the efficiency of mastering pedagogical disciplines, and, accordingly, contributes to the formation of a value-based attitude towards pedagogical knowledge. We have successfully held such round tables as “Child and Computer”, “Ecology of Childhood”, “Pedagogy of Love and Cooperation”, “Family - the Island of Spiritual Life (I.A. Ilyin)”, “Service and Feat of J. Korczak”, “Teacher of teachers (Ya.A. Komensky)”, “Laws of a spiritually healthy children’s group”, “Teacher is an engineer of the human soul”, etc.

We continue to develop a value-based attitude towards pedagogical knowledge in the process of organizing extracurricular activities with students. At the Department of Preschool Education of LNU named after. T. Shevchenko Center “Keys to the World of Childhood” is working productively, on the basis of which club activities are organized (Club “Spiritual Unity”, “Sparkling Facets of Pedagogical Science”), theatrical and volunteer activities. It has become a tradition to hold theatrical performances based on the results of studying a pedagogical discipline or its section, in the preparation of which a creative group of students and teachers participates. Previously, students independently immerse themselves in the material, based on which scripts for theatrical productions are created, and in seminars and club classes under the guidance of teachers, they search for value meaning in pedagogical knowledge. The most significant for the creative group were such theatrical productions as “The Little Prince” (on pedagogy), “Journey to Antiquity: Spartan and Athenian systems of education” (on the history of pedagogy).

Thus, the professionalism of a modern teacher of preschool and primary education is determined largely by his ability respond flexibly to the emergence of innovations in various fields of knowledge, especially in pedagogy, with the ability to use them both in professional and personal development, and in increasing the effectiveness of preschool and primary education.

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教育学理论中未来言语治疗教师交际文化的形成问题
**THE PROBLEM OF FORMING THE COMMUNICATIVE CULTURE
OF FUTURE SPEECH THERAPY TEACHERS IN PEDAGOGICAL
THEORY**

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抽象的。 本文讨论了交际文化的概念及其组成部分。 突出了言语治疗师对交际文化的熟练程度, 分析了未来大学言语治疗师成功形成交际文化的条件和方
法。

关键词: 交际文化的形成、未来言语治疗教师、学生、交际。

Abstract. *The article discusses the concepts of communicative culture and its components. The levels of proficiency in communicative culture by a speech therapist are highlighted, the conditions and methods of successful formation of the communicative culture of future speech therapists at the university are analyzed.*

Keywords: *formation of a communicative culture, future speech therapy teachers, student, communication.*

Every year the number of children of preschool and primary school age with speech disorders increases in the world. The causes of these violations can be quite diverse. The lack of effectiveness in correcting speech disorders in speech therapy classes may be due to the inability of a speech therapist to find the right approach to a child and interest him, the lack of emotional contact and trusting relationships between a specialist and a child with a speech disorder. This suggests that the results of correctional work with children with speech disorders directly depend on the level of formation of the speech therapist's communicative culture.

The formation of a communicative culture occurs to a greater extent during the students' studies at the university, that is, in the process of professional training. The works of I. I. Zaretskaya, S. V. Znamenskaya, L. A. Aukhadeeva, S. A. Ignatieva and others are devoted to the study of communicative culture and its formation in future speech therapy teachers.

In order to understand what the formation of the communicative culture of future speech therapy teachers consists in, it is necessary to consider the concept of the communicative culture itself, as well as what components it consists of.

S. V. Znamenskaya points out that communicative culture presupposes a set of norms, methods and forms of interaction and carries the best patterns and values of behavior [4].

L. A. Aukhadeeva notes that communicative culture is «a fundamental component of the general and professional pedagogical culture of a teacher, the property of a person to integrate his individual consciousness into the global space of public consciousness and achieve high results in spiritual development and professional activity on this basis» [2]. Based on the results of experimental research, the author identifies the components of communicative culture: the culture of thinking, perception, understanding, interaction, self-regulation, speech, appearance; empathy, reflection, the communicative core of personality, etc. [1]. Many scientists also attribute the following components to communicative culture:

- culture of speech etiquette,
- culture of speech and language,
- culture of bodily communication.

S. A. Ignatieva defines that the main component of communicative culture is communicative competence. By communicative competence, the researcher understands the ability to establish contacts with other people in communication. Pedagogical sociability is a special personal quality of a speech therapist teacher in the structure of communicative competence, the signs of which include: 1) the need to communicate with children; 2) a positive emotional attitude in communication; 3) pleasure from communication; 4) interpersonal attraction; 5) understanding of children; 6) resolution of interpersonal conflicts; 7) care and respect in communication; 8) aesthetics of communication [5].

In accordance with these criteria, the following three levels of teachers' mastery of communicative culture are distinguished:

1) the second category is the reproductive level, which assumes that the speech therapist teacher strives for communication, defends his opinion, but the potential of his drives is unstable;

2) the first category is the master level, which is characterized by a continuous desire to increase the circle of acquaintances, the predominance of initiative communication, the desire to help friends and take part in the organization of social events.

3) the highest category – the research level refers to a speech therapist teacher who feels free in a new environment, who needs communicative and organizational activities, navigates difficult situations with great speed.

A speech therapist with the first (reproductive) level knows the techniques of persuasive influence, but applies them without analyzing the whole situation.

A speech therapist with a masterful level of communicative culture analyzes situations together with students and gives them the opportunity to make a decision on their own.

A teacher with the third, research, level is constantly looking for new methods of persuasive influence, can predict the possibilities of their use in communication. He is able to intelligently use a variety of teaching and upbringing methods to achieve the highest results in the shortest possible time with optimal use of mental, volitional and emotional efforts on the part of both teachers and students [5].

Communicative culture turns into a defining aspect of the professionalism of a speech therapist teacher when its foundations are laid in the process of professional training of a student.

I. I. Zaretskaya identifies three conditions for the successful formation of a communicative culture in the process of professional training of a future teacher:

- mastering the secrets of pedagogical communication in the learning process;
- realization of the potential of pedagogical practice for the formation of the experience of productive communication;
- the influence of the style of relationships in the educational space of the university on the establishment of humane relations in interpersonal interaction [3].

It should be noted that in this process, a special place is occupied by the understanding of the future speech therapist teacher that he, as a person, acts at the center of the system of communicative culture. The development of such an understanding in a student is necessary in order for him to fully realize the importance of communication for himself, overcome isolation, form a creative position and strive to expand the content and forms of communicative activity. If the future speech therapist is open and ready for dialogue, knows how to attract the attention of others, has erudition, can find an individual approach to each child, then this indicates the right path to the formation of a high level of communicative culture.

Considering that the formation of a communicative culture is possible only in the process of communication, the peculiarity of this work should be the interaction between the communicative cultures of the teacher and the student. The teacher should strive for constant communication with students, helping them to realize the importance of competent communication in the educational, professional and public spheres, as well as in developing teamwork skills and the ability to resolve conflicts constructively. The teacher also acts as an example of interaction, helps students understand the value of open and respectful communication, and also influences the formation of positive skills for successful interaction with the outside world.

To master a high level of communicative culture, a teacher can help conduct communication trainings, role-playing games that simulate relationships between subjects of the educational process, as well as conducting an analysis of pedagogical situations in the classroom together with students. A special role is played by

the pedagogical practice of speech therapy students in preschool educational and general education institutions. It is during the internship that the future speech therapist develops communication skills with children with speech disorders, as well as the ability to listen and understand children.

The successful formation of a communicative culture among future speech therapy teachers is possible with a favorable moral and psychological climate at the university, which has the following evaluation criteria: the moral values of the student and the teacher, the unity of the team according to moral values. This means that in order to form a student's communicative culture, it is necessary to prevail such qualities in the team as social security, compassion, honesty, benevolence, friendliness, decency, self-control, nobility and others.

Consequently, the development of communicative culture among future speech therapists depends on the established style of relationships at the university. Thanks to the support of the moral and psychological environment, students gain experience of interaction in the field of pedagogy based on the principles of respect and trust.

So, the future speech therapy teachers should be focused on the area of promising personal development, and teachers, in turn, should constantly improve their level of communicative culture and provide comprehensive support and assistance to students in a timely manner. This means that the formation of a communicative culture involves the work of a future speech therapist on self-education and the creation of the necessary pedagogical environment by a teacher.

Thus, the formation of a communicative culture among future speech therapy teachers is an important task in pedagogical theory. The training of future speech therapists should be comprehensive, including theoretical training, practical exercises, role-playing games, trainings and seminars. This is the only way to achieve effective results in the formation of a communicative culture. All this is necessary so that future speech therapists can successfully communicate with their students, help them overcome speech difficulties and create a favorable atmosphere in the educational process. This is the only way to effectively cope with professional tasks and achieve high results in work.

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领导素质形成背景下学生自治的心理潜力

THE PSYCHOLOGICAL POTENTIAL OF STUDENT SELF-GOVERNMENT IN THE CONTEXT OF THE FORMATION OF LEADERSHIP QUALITIES

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The organization of student self-government is one of the most important tasks of professional training of highly qualified specialists. This is because a university graduate must be an independent, self-organizing, socially active person and have not only knowledge in the field of his professional activity, but also organizational skills as an integral result of university training. In addition, the process of vocational training is one of the components of the complete social integration of the individual, and the educational organization offers students conditions and opportunities for the development of their significant professional and personal qualities, incl. leadership.

Bukar Gamidullaev in his book “Self-government: the potential of the individual” says, “Self-government forms good personal qualities in a person; the person becomes an collected and intelligently acting being. The person’s behavior is consistent with public morality and personal moral convictions. Persistence, the ability to defend one’s beliefs and resist foreign influences is characteristic of a person with developed self-government. Self-government is carried out by the self-awareness of the individual. It is formed starting from an early age and continues to improve until old age” [1].

“Self-government is a state in which the subject and object of management coincide. At the same time, it is associated with freedom and independence, self-programming, which is associated with consciousness and purposefulness.” Wikipedia gives this interpretation of the concept [2].

In Ozhegov’s explanatory dictionary, we already see an example about student self-government “1. Same as autonomy. 2. Internal, with one’s own efforts, management of the affairs of some organization, team (for example, Student).”

In addition, Gamidullaev, listing the forms of self-government, names: individual, group, public, industrial, economic, economic, political, local, etc. We are interested in group - public self-government, which includes student self-government.

The most widespread and authoritative organization that has long been engaged in the study of self-government and its implementation is the All-Russian public organization “Russian Youth Union”. She gives the following definition of student self-government: student self-government is considered as a special form of proactive, independent, responsible social activity of students, aimed at solving the most important issues in the life of students, developing their social activity, and supporting social initiative.

Tumakova E.A. identifies three definitions of student self-government, which show the versatile advantages of the same process [3]:

1. Student self-government as a purposeful activity of students - as a special form of proactive, independent, responsible social activity of students, aimed at solving important issues in the life of students and developing their social activity.

2. Student self-government as a form of educational work at a university - the formation of a comprehensively developed, creative personality, with an active life position, the training of modern specialists who are competitive in the labor market.

3. *Student self-government - as one of the forms of youth policy* -the fullest use of the potential of students in the socio-economic transformations of society, solving student problems.

At one time, the federal target program “Youth of Russia” determined that student self-government should solve three pressing problems: become a condition for the realization of creative activity and independence of students; become a real form of student democracy; become a means of social and legal self-defense.

So, let us consider the psychological specifics of student activity within the framework of the work of student government.

For a specific person, student self-government is necessarily associated with activity and non-activity and can include group and individual activities, incl. with individual forms of activity.

These features are important for us because... determine the activity and joint specifics of development potential characteristic of student self-government.

The next aspect of the specifics of student self-government is related to the age of its participants, characteristic of a given social group. The fact is that students as a whole allow for a very wide age range.

On the other hand, the actual situation of the student population also confirms its wide age range, especially considering the different levels of education - bachelor's, master's and postgraduate degrees. As a rule, according to statistics at the

beginning of the academic year, more than 1/5 of all students at Russian universities are already adults, incl. aged 26 years and older. At our university - Lugansk State Pedagogical University, the average age of a student is slightly lower

Based on this, we can conclude that it is, at least, not entirely correct to talk about the exclusively youthful specificity of modern students, as is often done in research. Full-time students in a young age range represent empirical samples in such studies, as a rule. In this regard, such studies are quite correct. Accordingly, when considering the development of student activists, we must remember that they may be at different stages of ontogenesis (from adolescence to early adulthood, and, as an exception, later stages), which makes the overall picture of such development very heterogeneous.

The next feature of the sought-after specificity is that student self-government is carried out in conditions of professional training. In this regard, it is natural to organize professionally oriented activity of students, but this approach has so far been presented only for some areas of training: for example, for future teachers, social workers, psychologists - for example, when performing volunteer activities within the framework of the work of the social sector of self-government.

Finally, another aspect of the sought-after specificity is that student self-government is associated not only with the positive, which is usually limited to researchers, but is associated with many risks, difficulties, and with obstacles, some of which will be discussed below.

Let us consider the psychological potential of student government and its types.

To express the "source" aspect of students' activities in self-government, different terminology is used, using the concepts of opportunities, means, pedagogical technologies, educational and professional capital, etc.

However, the Psychological Potential of Student Self-Government is most often used - various specifications of the concepts of resource and potential.

Thus, the activities of students in self-government are considered as a resource: informational, developmental; moral development; psychological and pedagogical, socialization, self-realization, professional development, etc.

On the other hand, it is shown that this activity of students has potential: pedagogical, educational, educational, moral, etc.

Let us note that the psychological potential of student self-government is ambivalent, and its alternative (positive and negative) manifestations could be considered as basic types. At the same time, when studying student self-government, we, like many other researchers, are most interested in its potential for the development of students: their personality, subjectivity, professionalism, etc [4].

Two basic types of psychological potential of student self-government can be distinguished: developmental and regressive.

Obviously, the developing type of psychological potential of student self-government is normative and socially desirable. However, in practice it coexists with its negative (shadow) antipode: regressive potential.

Involving in the activities of self-government, initiating or even relatively passively experiencing various non-active manifestations of the corresponding activity (contemplation, experiencing, understanding), the activist, voluntarily or involuntarily (with the help of both voluntary and involuntary; both conscious and unconscious mental regulation), changes, on the one hand, himself: his state and functional capabilities of the psyche, his inner world, his personality. At the same time, on the other hand, it, in principle, changes the subjects external to it and involved in interaction with it. Moreover, the effectiveness of all these changes (both internal and external) depends not only on the organization and on content of the activity, but also on the degree of readiness for changes (or, conversely, resistance to them) on the part of the activist himself and the other mentioned subjects.

A.A. Bogdanov noted similar patterns, when he pointed out that individual activities in organized activity are added up, but at the same time, the encountered resistances are subtracted from them, including “internal resistances of the body,” which, at the same time, can decrease under the “mental” influence of cooperation [5].

On the other hand, internal resistance to the world-creating changes that this kind of activity leads to can be strong both on the part of an individual (for example, due to the underdevelopment or deformation of his personality) and on the part of various social structures for which such changes are undesirable. Internal sources of such resistance to realizing the positive potential of self-government can be, in particular, inadequate needs, motives, values, and meanings.

However, such problems did not appear today. Even Konstantin Dmitrievich Ushinsky wrote about the serious problem of man’s duality in the moral sphere, soul, beliefs, and personality: “piety and trickery, dishonesty and conscientiousness, merciless selfishness and sometimes heroic self-sacrifice for the benefit of one’s family are combined in one and the same person.”[6, T2, p.440].

If we talk about student self-government, such an existential duality of a person, leading to intrapersonal conflicts and crises, manifests itself, in particular, in the fact that the motive of altruism does not fit well with the motives of power, possession, with attitudes of egocentrism, narcissism, Machiavellianism, etc. In this perspective the self-governing activity of students, realizing the world-building function in its positive mode, simultaneously performs two functions that are more specific: psychocorrectional and psychoprophylactic.

Accordingly, ignoring these functions under certain other negative conditions can lead, on the contrary, to the realization of regressive potential, the development of personality deformations, character accentuations, neuroses, etc.

Participation in self-government activities allows one student to gain self-confidence, another to significantly transform the hierarchy of their life values, etc. At the same time, all types of negative potential are structured as part of the regressive transformative potential, complemented by the direct creation of negative new formations (such as cynicism, pessimism and etc.).

For student self-government, the external-subject, informational and subjective plans of both its world-creating function and all the types of its psychological potential discussed above are not realized in isolation, but in an inextricable systemic unity. In this regard, a change in the activist's inner world is closely related to a change in the subjectively perceived, felt and understood properties of material "things" and information signals. Thus, the outside world as a "habitat" becomes different for the activist, opening up something new for him.

Many of the essential characteristics of the developmental potential of student self-government discussed above can be associated with the results of theoretical and empirical research, offering a generalized interpretation, according to which the self-governing activity of students has psychological potential (and under certain conditions can become a psychological resource).

The result of the work of student government bodies is the identification and replenishment of a group of leaders who know how to work in a team of students, who, along with professional development, receive all the necessary socialization skills. Participation in student government is the first experience of independent work.

Thus, student self-government at a university is a means of professional development of the personality of a future specialist with an active life position. Therefore, the organization of student self-government should be considered as one of the important forms of training future professionals [8].

Summing up, we can conclude that student self-government currently, in the context of the formation of leadership qualities, has a powerful developing psychological potential.

At the same time, for its effective implementation when organizing the activities of student government bodies, it is necessary:

- take into account certain, objectively present risks and dangers (corresponding to the alternative – regressive potential);
- to create certain psychological and pedagogical conditions, on the one hand, favorable for the realization of developmental potential, and on the other, preventive and corrective to prevent the realization of regressive potential.

Thus, in general, the psychological potential of student self-government in the conditions of the formation of leadership qualities of a competent and socially active person is ambivalent, and the fundamental, generalized direction in which it will accumulate and be realized (developmental or, on the contrary, regressive) is

determined, first of all, by the value and semantic position of the student activists themselves, as well as other subjects involved in self-government activities and the educational process in general.

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索罗金小说《兄弟之路》中的语境象征

CONTEXTUAL SYMBOLIZATION IN V. SOROKIN'S NOVEL "THE WAY OF BRO"

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抽象的。 本文探讨了弗拉基米尔·索罗金小说《兄弟之路》中的语境象征手段、创世神话、世界末日、冰的象征和神话、光之兄弟会的后现代对立以及脱离 卡洛斯·卡斯塔内达的《魔术师》。 文章描述了小说的体裁多样性。

关键词：冰神话、语境象征、哲学惊悚片、弗拉基米尔·索罗金、卡洛斯·卡斯塔内达、后现代对立、“兄弟之路”。

Abstract. *The article examines the means of contextual symbolization in Vladimir Sorokin's novel "The Way of the Brother", the mythologems of creation, the end of the world, the symbol and mythologeme of ice, the postmodern antithesis of the Brotherhood of Light and the detachment of magicians by Carlos Castaneda. The article describes the genre diversity of the novel.*

Keywords: *ice mythologeme, contextual symbolization, philosophical thriller, Vladimir Sorokin, Carlos Castaneda, postmodern antithesis, "The Way of Bro".*

Vladimir Sorokin's trilogy consists of three novels: "Ice" (2002), "The Way of Bro" (2004), "23000" (2005). The events begin in the novel "The Way of Bro". This is a prequel to the novel "Ice", and its action takes place before the events described in the novel "Ice". The action takes place against the background of the history of the world, in Germany and Russia, called the Land of Ice by the brothers of Light.

V. Sorokin's novel "Let Bro" is dedicated to the esoteric search for the Brotherhood of Light. The Brotherhood of Light was founded by Bro (the official name of the hero is Alexander Snegirev). The action begins on June 30, 1908 – the time of the hero's birth. He found space Ice at the site of the Tunguska meteorite fall. At this point, Alexander woke up, realized his real name and wanted to find and awaken other members of the Brotherhood. The main character's heart was awakened by touching the Ice. The first person Bro awakened was Sister Fer. When Bro is with Fer, he feels an extraordinary clarity of consciousness. Together they are

able to see other siblings. Vegetarianism is accepted in their sect. Blue-eyed and blond people are potential members of the Brotherhood. First, Bro and Fer wander in the land of ice (in Russia), and then travel around the world. In the 20th century, the Brothers were Chekists and Nazis (this is described in the novel “The Way of Bro” and the second part of the novel “Ice”), and in modern times they have become a powerful LED corporation. They are indifferent to ordinary people. They don’t feel blood kinship. Ordinary people are people with dead hearts, and they are meat machines because they consume meat. Fer and Bro need to find thousands of people to become rays of the Primordial Light. All 23 thousand people should form a large circle and speak with their hearts together. As soon as this happens, the Earth will disappear, and they will become rays of light again.

Myths about the ancestral homeland of the Indo-Europeans, the myth of the creation of the world, the myth of the end of the world, the myth of the stone as the source of all the forces of the universe, the myth of Ice as the ancestral homeland of the Hyperboreans actively enter into a cultural dialogue with the reader.

The artistic time and the artistic space of the novel are formed by the conjugation of the sacred initial (the time before the meteorite falls) and the final time (the light from the Ice will engulf the Earth), as well as historical time.

“At first there was only the Primordial Light. And the Light shone in Absolute Emptiness. And the Light shone for Itself. <...> Time did not exist. There was only Eternity.”

The artistic space of the novel has become the space of myth, it is formed by the juxtaposition of textual geographical, social and cosmic spaces.

The narrative in the novel “The Way of Bro” is conducted on behalf of the character-narrator Bro. Bro goes through the path after initiation. Finding yourself after finding the Ice is a successful initiation. Bro completely renounces human food and drink. He and all his brothers eat vegetarian food. All their efforts are aimed at solving the ultimate task - to find other sisters and brothers.

Bro breaks the bonds of civilization, renounces all values. He goes through a long spiritual path and becomes a being from another world. To some extent, the hero can be called enlightened. Bro wants to bring the end of the world closer. He wants to bring Harmony back to the Cosmos. To do this, he does everything to make the earth disappear into the light.

The narrative follows the pattern of a ritual scenario. First, a magic circle of initiates is formed, then a ritual tool (ice hammer) is made. Then other brothers and sisters awaken, there are 23 thousand of them in total. And finally, the whole story must end with the transition of the newfound into the Light.

“And one day we (23 thousand rays of the Primordial Light) created a new world. <...> It was planet Earth. <...> It was a great mistake of Light. And the primordial Light will awaken in you <...> And flare up. And the Earth <.. > it will dissolve into the Primordial Light.”

The archetypes of mythopoetic thinking are represented in the language of the novel by symbols. For example, the symbol of Ice. This is the mystery of the Tunguska meteorite, and the concentrate of wisdom and power, and the ancestral home of Hyperborea, and ice as a symbol of evil, lifelessness, death, transparent rock crystal. Its cosmic origin and exorbitant influence on the fate of the Earth are emphasized.

The symbol of Ice is inseparable from the figurative and semantic structure of the work.

Ice is the opposite of Fire. He has the following attributes: Divine, Heavenly, mighty, pure, solid, transparent, great, precious, native.

“Divine silence stood all around. My hands touched the Ice. And I understood why I came here. I found a huge and native one!”

The earth’s ice is miserable, like everything earthly (human): language, music, literature, love, fire. And Ice is a piece of the world of Harmony. Ice is a language teacher.

Ice teaches the heart of Bro the innermost words of the sacred language, which is as opposed to the poor language of people as the true is to the false. Having not yet turned to Bro, but anticipating the coming huge and native, the hero stops talking to people, refuses their dead food. These were his first steps in gaining his identity.

In the novel “The Way of Bro”, people awakened by Ice, full of Light, resort to the magical power of the circle. They ritually form a circle, holding hands. To communicate with the cosmos, to gain intimate knowledge, the brothers stand in a circle. The circle is a symbol of spirituality and eternity.

In the finale of the novel, “Ice” becomes the word LED. This is a modern word, the Latin alphabet imitates the Cyrillic alphabet.

The most powerful mythologeme is Ice as the antithesis of Fire. In Carlos Castaneda’s books (“Fire from Within”, “The Gift of the Eagle” and others), a group of magicians goes into the second attention, burning in the Fire. Sorokin decided to make a parody of the esoteric works of K. Castaneda and instead of Fire gave a conceptual symbol of Ice. Ice has binding and materialization properties. If its opposite, Fire— causes it to rise up, then cold, on the contrary, lowers it down.

Ice is thoughts, while fire is feelings and sensations. Ice preserves, fire transforms. Ice looks to the past, fire looks to the future. Together they form two powerful streams moving from top to bottom and from bottom to top.

Brothers and sisters of the Light give up all their relatives, children, when they are woken up by an ice hammer. Complete indifference engulfs them when they recall past social connections. Exactly the same indifference is experienced by magicians from Castaneda’s seer squad. The edge of the spirit takes back La Gorda from his two daughters, social and biological ties are broken.

The closest thing to Bro is his spiritual sister Fer, the first girl he woke up and extracted from the ordinary world of people. Here is an allusion to the pairs of seers described in Castaneda's writings. For Fer and Bro, the main purpose of life is to find other brothers.

“Of all the Brotherhood, only Fer and I could see our hearts. We could only do it together. Separately, neither Fer nor I possessed this Gift of Light. Only together could we search. And find it right away. Every search shook our hearts.”

An ordinary boy is invisibly connected with the Tunguska meteorite before our eyes. The meteorite turns out to be a piece of ice. The boy becomes a single-minded monster. At first, the hero causes sympathy and pity (he lost almost all his relatives), then fear and disgust.

“We looked at the lives of meat machines working with money and guarding it. After four days, we knew everyone's life. On the fifth day, the brothers entered the cave to the main keeper of the money. And they took his wife and three children away from him. Then he was offered to exchange money and gold for children and a wife. He really didn't want to do that. Because money and gold were very important to him. But he loved his wife and children a little more than money. Therefore, he took out a bag of money and half a bag of gold from the cave with the money. We returned the children to him, but his wife had to be killed. She remembered the faces of the brothers.”

Bro and his sect's group constantly commit theft and murder for higher purposes. They do it mechanically, like automatons. For the sect, the main thing is the goal.

“There were only five of us who woke up with our hearts. There were 22,995 brothers and sisters scattered throughout the complex world of this planet. They lived in different countries, spoke different languages, unaware of the Great Kinship, knowing nothing about their true nature. Their hearts were asleep, pumping blood with wordless pumps in the bodily darkness. Then they wore out, aged, and stopped. And they were buried in the ground. But the Light that left the dead heart was immediately embodied in the heart of the newborn person, making him our brother. And his little heart began pumping blood again in the darkness of his infant body.”

In the second half of the novel, the style of the language changes. It becomes simplified, schematic. The main character himself is changing. The world is also changing. The world has become a battleground with meat machines. People who do not know how to listen with their hearts and eat meat become annoying enemies of the Ice sect.

The phrase “meat machines” began to be repeated too often in the second half of the novel. Bro sees and describes people as meat machines. Their classes are completely meaningless, especially boring Bro describes art, books, singing, music and cinema.

The genre of the work can be defined as a travel novel, as an adventure novel, as a philosophical thriller. This is partly a dystopia. The novel can be called an allegory. The novel “The Way of Bro” replays in literary form the principle of changing reality from the new age movement, the mystery of religion as a form of group consciousness, the endless search for ideology among mankind.

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数字通信：当前问题和未来的新挑战
**DIGITAL COMMUNICATION: CURRENT ISSUES AND NEW
CHALLENGES OF THE FUTURE**

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注解。数字通信的快速发展在现代人的生活中占据主导地位，并成为社会文化空间转型的城市形成机制。本文提出了在分析数字通信本质时发现的问题的相关性问题。

关键词：传播、数字传播、数字化、网络空间、热门传播、可扩展的社会性、网络犯罪。

Annotation. *The rapid development of digital communications has taken a leading position in the life of a modern person and has become a city-forming mechanism in the transformation of the sociocultural space of society. This article raises the question of the relevance of the problems identified when analyzing the essence of digital communication.*

Keywords: *communication, digital communication, digitalization, network space, hot communication, scalable sociality, cybercrime.*

Modern society, characterized as post-industrial, is rapidly developing, constantly increasing the flow of information. Scientists have put forward the theory that at present, life in 10 years covers such a volume of events that hardly previously occurred over a period of 100 years. One version of the explanation for this phenomenon is that this was facilitated by technological progress, which caused an “information boom” in the sociocultural space of society. The technological breakthrough, which led to the massive introduction of digital communications, was reflected in all spheres of life. This has become a significant factor in reducing the period for resolving issues at the global, state, industry and interpersonal levels. Moreover, this naturally entailed a change in the cultural paradigm of society. According to J. Baudrillard: “Communication is no longer carried out based on the symbolic, it occurs based on technology: this is communication” [1, p. 171].

The modern dynamics of culture do not imply any other development than as a culture of technical achievements. It should be noted that the level of re-

search into digital communication is very ambiguous. If we take into account the works of such foreign scientific researchers as D. Bell, P. Bourdieu, J. Gelbride, M. Castells, M. McLuen, who were devoted to the study of the culture of digital communication, it becomes obvious that these studies preceded the identification of digital communication itself as a phenomenon. In addition, the problems of communication processes in the network space were covered by both foreign researchers (J. Cordon, R. Porter, O. Toffler, K. Shannon) and modern domestic researchers (V. I. Gladyshev, V. D. Isaev, A. O. Kalmykov, T.V. Lugutsenko) and others. According to V.D. Isaev: “The culture of digital communication is a condition for the use of rapid human adaptation to the pace of development of society, which determines its dynamics” [2, p. 118]. Thanks to the emergence of digital technologies, the boundaries and possibilities of communication have expanded. Interpersonal communication through digital technologies has taken over the virtual space, changed it, and brought the virtual service closer to the needs of the individual, who thereby acquired the opportunity to be both an active participant and a direct creator of virtual reality resources and services.

An analysis of scientific sources makes it possible to verify that the study of the phenomenon of digital communication does not yet have a sufficient level of research, since digital communication is in a stage of constant development, thereby displacing other forms of communication, such as oral and documentary. G. M. McLuhan divided the medium of communication into “hot” and “cold”. The principle of separation of communication means lies in the number of senses involved in the process of perceiving information coming from the outside. The essence of a “hot” means of communication is that now of information perception there is an expansion of feelings to the utmost degree - “high certainty” [5]. In this case, high certainty is nothing more than a state of being full of data. At the time of the research (the second half of the twentieth century), G. M. McLuhan considered the telephone (wired landline) a “cold” means of communication, since the impact of information was perceived and experienced only by ear. Since then, in the digital development of society, the speed of data transmission has increased to immense proportions. The scientist predetermined the inevitability of an increase in the speed of information transmission, instantly transforming from a mechanical form into an electrical one, and as a consequence, the inexhaustibility of the functions of media technologies, the essence of which is not only in providing communication links, but also in some way beyond the visible and audible, i.e. “outward expansion of humanity” in the future.

Modern digital communication technologies have begun to have the maximum impact on a person in the process of perceiving information, stimulating several senses at the same time, thereby providing a person with the opportunity to consume a huge amount of data and metadata in the shortest possible time and with

minimal effort. In addition, in this regard, a clear understanding comes that the modern culture of communication is so filled with digitalization that it is advisable to talk about its oversaturation, i.e. “overheating” [5].

Along with this, an insufficiently studied field for discussion is the boundaries of the real and virtual in the digital environment of interpersonal communications. While exploring the problem of polymedia, D. Miller noted that there is no difference between real life and virtual life as such, and their categorical difference from each other is its behavior model. The researcher, in considering the aspects of media influence, applied the concept of “scalable sociality”, which laid down the meaning of multifunctionality and a wide range of influence of digital communication media on society, in which there is a one-to-one shift of the poles of private and mass communications. Thus, thanks to the inherent flexibility of digital communication technology, not only does the rapid change from one communication to another occur, but also the unlimited consumption of information content and the blurring of boundaries between private and public becomes acceptable, which entails a certain range of new tasks and problems for the inexperienced consumer and the fragile mind of the younger generation (our italics – I.K.) [6].

At the same time, one more important aspect of the influence of digital communication on the formation of social and political mentality in society should be noted. M. Castells focuses on the problem of managing digital communications. In his opinion, the impetus for the emergence of modern social movements is given directly through network platforms of digital communications, due to their inherent multimodality. Of course, the means of digital communications for this purpose support the autonomy of communicative tasks and are an appropriate environment for the formation and implementation of any social movement or community. The emergence, mobilization and transmission of social movements through digital communication in all their diversity is an unpredictable and difficult to control process, which in practice cannot be prevented and is not so easy to stop. However, due to the lack of a mechanism for control of a regulatory nature on the part of government agencies, the control of such social processes transmitted to society through digital communications is currently devoid of a common understanding and is only at the primary stage of formation [3].

Thus, it should be noted that digital communication undoubtedly enriches our lives with events, makes it richer and more meaningful, but thereby, like a “dis-service”, deprives us, consumers of information, of space for imagination, comprehension and creativity and, as consequence, self-development. Nevertheless, the lack of regulatory mechanisms and legal support for the security of individuals and society in the digital environment has become an impetus for the generation and development of cybercrime, destructive movements, lobbying for marginal attitudes and non-traditional values in society.

Thus, the problem of personal security in the process of digital communication is an important priority for research and scientific research, both now and in the future.

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青少年环境中异常行为的心理教育学方面
**PSYCHO-PEDAGOGICAL ASPECTS OF DEVIANT BEHAVIOR IN
YOUTH ENVIRONMENT**

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抽象的。 本文专门讨论青年和青少年中异常行为的紧迫问题，这是俄罗斯联邦在国家社会心理和心理健康领域国家安全的一个重要方面。 作者分析了预防、克服和纠正异常行为的心理学和教育学方法，强调了研究方向的系统化和预防措施的实际实施问题。 特别关注教育机构在塑造文化完整性和俄罗斯传统精神和道德价值观以及青年爱国主义教育方面的作用。 文章对越轨行为的分类进行了分析，并从心理学和教育学的角度探讨了其形成和发展的机制。 作者提出的方法和建议有助于制定有效的战略来预防青少年环境中的异常行为。

关键词：心理学、教育学、越轨行为、青少年环境、预防。

Abstract. *The article is devoted to the pressing issue of deviant behavior among youth and adolescents, which is an important aspect of the national security of the Russian Federation in the field of socio-psychological and mental health of the nation. The authors analyze psychological and pedagogical approaches to the prevention, overcoming, and correction of deviant behavior, highlighting issues of systematization of research directions and practical implementation of preventive measures. Special attention is paid to the role of educational institutions in shaping the integrity of culture and traditional Russian spiritual and moral values, as well as in patriotic education of youth. The article contains an analysis of classifications of deviant behavior and examines the mechanisms of its formation and development from the perspective of psychology and pedagogy. The approaches and recommendations proposed by the authors can contribute to the development of effective strategies for the prevention of deviant behavior in the youth environment.*

Keywords: *psychology, pedagogy, deviant behavior, youth environment, prevention.*

One of the tasks of national security of the Russian Federation in the field of socio-psychological and mental health of the nation is the comprehensive preven-

tion of deviant behavior among teenagers and youth. Maintaining the integrity of Russian identity, culture, traditional Russian spiritual and moral values, and patriotic education of citizens will contribute to the further development of the democratic structure of the Russian Federation and its openness to the world [3]. According to data presented in the article by E.A. Zadorozhnaya and co-authors (2023), in Norwegian schools 9% are subjected to bullying, in Finland - 11–13%, in England - 12%, in Germany - 11.1%, in Switzerland - 13.8%, in the USA - 30.9%, with bullying being organized and systematic in nature [8].

The degree of development of the problem. The mechanisms of formation, development, and prevention of deviant behavior in adolescents were studied by L.S. Vygotsky, A.N. Leontiev, I.S. Kon, L.I. Bozhovich, V.V. Davydov, D.B. Elkonin, V.D. Mendeleevich, Y.A. Kleiberg. The study of deviations is dedicated to the anthropocentric theories of scientists: P. Kelly, E. Kretschmer, C. Lombroso, W. Sheldon; theories of anomie by E. Durkheim, R. Merton.

Despite the presence of a large number of scientific studies on deviant behavior among adolescents, practical approaches to the implementation of prevention, overcoming, and correction of deviations in adolescents are not systematized, and interdisciplinary research (in pedagogy, psychology, sociology, medicine) is disjointed and uncoordinated. Due to the relevance of the scientific development of the stated problem and the practical implementation of a systematic approach to the prevention, overcoming, and correction of deviant behavior in adolescents, the goal of the present study was formulated.

The goal of the study: systematization of directions in psycho-pedagogical prevention of deviant behavior in the youth environment.

Psychological classification. In psychology, there are classifications that assess deviant behavior from the perspective of psychological factors, personal characteristics, and the presence of psychopathology [1, 4, 9]. The criterion for the psychological classification of deviant behavior is the distinction between the socio-psychological actions of young people. Taking into account the psychological criterion, the norm and the type of its violation by a person are evaluated, the psychological goals and motives of each specific action are studied, considering the individual behavioral style of the personality.

The first criterion of psychological classification of deviant behavior is the type of violated norm [4]. Deviant behavior can violate various socially accepted norms, such as behavior at work, in school, in the family, or in public places. For example, this can be theft, violation of driving rules, violence, violation of ethical norms in business, etc. The classification of deviant behavior according to this criterion allows distinguishing different types of violations and identifying their characteristics [6].

The second criterion of classification of deviant behavior is the psychological goals and motivation of the behavior. In analyzing deviant behavior, it is impor-

tant to understand what psychological motives and goals prompt a person to commit it [7]. For example, this can be the desire to achieve power and control over others, satisfaction of personal needs, the desire to relieve emotional tension, or the aspiration for recognition. The classification of deviant behavior according to this criterion allows understanding what motives underlie such behavior and what psychological factors can be significant in its manifestation [1].

The third criterion of classification of deviant behavior is the results of this behavior and the damage caused by them [4]. Deviant behavior can have various consequences for the person, for those around, and for society as a whole. Uncontrolled aggression, for example, can cause injuries to other people, and theft can lead to direct financial damage [1]. Distinguishing deviant behavior based on its results helps determine what damage can be caused and what measures of prevention and assistance are needed.

The fourth criterion of deviant behavior classification is individual-style behavior characteristics. Deviant behavior manifests itself in each person's unique style. Some may be inclined towards aggression, others towards manipulation, and still others towards masking their actions. Studying individual-style behavior characteristics allows a better understanding of which factors, such as personality traits, upbringing, lifestyle, etc., may contribute to the emergence of deviant behavior.

According to the classification of deviations by Yu.L. Kleiderga, three major groups can be distinguished, including negative, positive, and socially-neutral types of behavior. According to Yu.L. Kleiderga, a deviant personality is so engrossed in their pursuits that they develop only in that direction, rather than harmoniously. Positive deviations include excessive social creativity, fanatical participation in youth movements. Negative deviations of behavior include the use of psychoactive substances, antisocial and self-destructive actions. The author considers begging and other forms of stereotypical reactions that do not have a pronounced destructive influence on society and are not widely spread phenomena as socially-neutral deviations.

The typology of deviant behavior by Ts.P. Korolenko and T.A. Donskikh consists of two types of behavioral deviations: non-standard behavior and destructive behavior. Destructive behavior includes external-destructive and internal-destructive. External-destructive behavior includes addictions and antisocial behavior. Internal-destructive behavior includes suicidal acts, conformism, narcissism, autism, and fanaticism. This classification fairly fully reflects the psychological phenomena of deviations, but raises questions about autistic destructive behavior, as according to medical norms and classification of diseases, this type cannot be considered normal due to its typicality for endogenous mental disorders.

Considering similar classifications by foreign authors, let's describe the above-mentioned forms of deviant behavior. Deviations can cause harm to individuals,

society, and to the individuals leading this lifestyle. Non-standard behavior is considered positive and makes a constructive contribution to the development of society, whereas deviations are associated with negative consequences and violation of social norms. Additionally, another group of behavioral deviations is distinguished - destructive behavior, which is difficult to classify entirely as deviant behavior.

Destructive behavior includes two subtypes: external-destructive and internal-destructive. External-destructive behavior refers to the violation of social norms. It can be addictive, meaning associated with dependency, for example, on drugs or alcohol, and antisocial, meaning aimed at harming others and violating rules and laws.

Internal-destructive behavior refers to behavior that manifests within the individual. These forms of behavior include suicidal behavior, conformist behavior, narcissistic behavior, fanatic behavior, and autistic behavior. Suicidal behavior is associated with self-destructive tendencies and attempts at suicide. Conformist behavior implies complete adherence to accepted norms and standards. Narcissistic behavior is characterized by excessive self-esteem and inflated self-esteem. Fanatic behavior is associated with extremist or ideological beliefs and manifests in a tendency towards violence. Autistic behavior is associated with social isolation and a lack of emotional and social connection with the surrounding world.

It is important to note that destructive behavior has negative consequences for both individuals and society as a whole. It can harm the health and well-being of individuals and can have a negative impact on social relationships and societal stability.

Non-standard behavior and destructive behavior are two different groups of behavioral deviations. While non-standard behavior can be positive and contribute to the development of society, destructive behavior is characterized by a violation of social norms and can have negative consequences for individuals and society. T. Turunen systematized deviant behavior and identified three groups of behavioral deviations: asocial (amoral), antisocial (delinquent), and autodestructive (self-destructive).

Asocial behavior, or amoral behavior, describes a deviation from social norms and values. This behavior may include breaking laws, moral crimes, and a lack of ethical constraints. People exhibiting asocial behavior disregard the interests and needs of society and other people.

Antisocial behavior, or delinquent behavior, is associated with breaking the law and society's rules. This behavior may include crimes, unlawful actions, and the denial of accepted social norms. People exhibiting antisocial behavior often have adaptation problems in society and conflict with the legal system.

Autodestructive behavior, or self-destructive behavior, refers to actions and decisions that harm the individual themselves. This may be associated with self-

harm, drugs and alcohol, psychological problems, or other negative influences on health and well-being. People exhibiting autodestructive behavior may need help and support to overcome their problems and change their behavior. It is important to note that this classification is relative and conditional, and its purpose is a scientific analysis of deviant behavior. Each group of behavior has its own characteristics and consequences, and they require an individual approach and understanding to address issues related to deviant behavior.

One of the well-known researchers who dealt with the problem of deviant psychology is E.V. Zmanovskaya, who presented her classification based on the criterion of the type of norm violated and the social consequences when implementing corresponding behavior. The main criterion of deviant behavior the author calls the type of norm of behavior violated by the person, accordingly dividing all deviations into three major groups: delinquent, autodestructive, and asocial behavior.

According to the works of E.V. Zmanovskaya, the classification of deviations includes the following types of deviant behavior:

Primary deviations:

- a) Impulsive deviations: aggression, violence, vandalism.
- b) Passive-aggressive deviations: suicide, drug use, alcoholism.
- c) Consumer deviations: excessive consumption of material goods, compulsive shopping.
- d) Asocial-deviant deviations: criminality, violation of legislation.

Secondary deviations:

- a) Communication deviations: reduced social skills, avoidance of communication.
- b) Educational deviations: lack of interest in studies, truancy, disobedience.
- c) Labor deviations: laziness, unemployment, illegal actions at work.
- d) Family deviations: violence, conflicts, divorces.

Tertiary deviations:

- a) Psychosomatic deviations: neuroses, phobias, asthenic states.
- b) Spiritual-ideological deviations: fanaticism, sectarianism, radicalism.

Conclusion. Thus, there is no single unified classification of deviant behavior from the perspective of psychology at present. Authors consider deviant behavior, establishing various forms and criteria that differ from each other, which dictates the need for systematic detailed consideration of issues of systematization and development of unified criteria of deviant behavior.

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论心理洞察力作为心理学家专业重要素质的问题
**ON THE PROBLEM OF PSYCHOLOGICAL INSIGHT AS
A PROFESSIONALLY SIGNIFICANT QUALITY OF A
PSYCHOLOGIST**

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注解。文章在心理科学的背景下分析了心理洞察现象。研究表明，现代科学中对心理洞察力的研究以对这一心理现象的一般概念和个体方面的各种研究为代表，这种具有专业意义的人格品质具有复杂的结构。然而，对该领域的科学研究分析表明，对心理洞察力的结构及其个体特征的研究和阐述水平还不够。

关键词：教育心理学，心理洞察力，心理洞察力的动态。

Annotation. *The article analyzes the phenomenon of psychological insight in the context of psychological science. It is shown that the study of psychological insight in modern science is represented by a variety of studies concerning both the general concept and individual aspects of this psychological phenomenon, that this professionally significant personality quality has a complex structure. However, an analysis of scientific research in this area has demonstrated an insufficient level of study and elaboration of the structure of psychological insight and its individual characteristics.*

Keywords: *educational psychology, psychological insight, dynamics of psychological insight.*

Psychological insight is a critical quality in various professions where interaction with people plays a key role. Without this quality, managers, teachers, doctors, lawyers and other professionals would be unable to effectively perform their professional responsibilities. However, it is especially significant in the work of a practical psychologist, since it is thanks to psychological insight that a specialist can better understand the inner world of clients, create a long-term impact and successfully solve various problems. Psychological insight is the ability to analyze people’s behavior and emotions at a deeper level than just observing external manifestations. This allows the practical psychologist to establish trusting relationships with clients, subtly sense their needs and help them achieve psychologi-

cal well-being. It is important to note that psychological insight also promotes the development of empathy and understanding, which is the basis for effectively resolving conflicts and helping people solve their problems. As a result, this quality allows practical psychologists to have a significant impact on the lives of their clients and contributes to the successful implementation of their professional tasks.

The concept of psychological insight is a key element in modern psychology. It is important to note that researchers are increasingly emphasizing not only its academic significance, but also its practical application in the work of a psychologist. Dictionaries and encyclopedias devoted to psychological terms actively include definitions of psychological insight. For example, such well-known scientific publications as “Psychological Dictionary” by Yu. L. Neimer and “Psychological Encyclopedia” devote special attention to this term [7].

Research into psychological insight began long before the term “psychological insight” was coined. An important contribution to this topic was the research of N.P. Erastov, who in 1975 first introduced the concept of psychological insight. His works emphasize that this is not just the ability to understand a person and his character, but also the ability to predict possible changes in behavior [4].

Researcher A.A. Bodalev, although he did not use the term “psychological insight,” made significant contributions to the study of human perception and understanding of humans. His research, published in 1983, emphasizes the importance of analyzing interpersonal relationships and the influence of psychological factors on interaction [1].

Psychological insight is a key aspect in understanding human nature and behavior. Research in this area stimulates the development of psychology and helps expand our knowledge of the human psyche and relationships. Thus, the study of psychological insight in modern science is represented by a variety of studies concerning both the general concept and individual aspects of this psychological phenomenon, which contain valuable research results and conclusions about the importance of each of these aspects.

In general, in many psychological studies devoted to the analysis of interpersonal perception of a person, the problem of psychological insight is considered taking into account two main aspects. The first aspect examines the mechanisms of social perception. This includes an analysis of the process of interpersonal interaction and the study of various phenomena that accompany this process, such as stereotyping, halo, primacy, condescension, novelty and others (V.S. Ageev, G.M. Andreeva, O. Bodalev). Within the second aspect, attention is paid to the psychological characteristics of the perceived individual. Particular emphasis is placed on describing his emotional state, character traits, behavioral reactions and other aspects. Approaches to studying this problem may vary, but almost all of the studies reviewed highlight the psychological characteristics of the subject of perception as one of the most important components of the process of human-human interaction.

A detailed study of the essence and structure of psychological insight was carried out by such scientists as A.A. Borisova, V.G. Zazykin, E.A. Korsunsky, O.P. Sannikova, N.E. Esmanskaya. Their work allowed us to more deeply understand the mechanisms of formation and manifestation of this quality in humans. In particular, research by V.G. Zazykin showed the influence of observation and predictive abilities on psychological insight, which demonstrated the importance of these aspects in the formation of a full-fledged psychological portrait of a person [6].

Psychological insight, according to research by O.P. Sannikova, is a complex personality trait that allows one to adequately perceive the inner world of another person. This is the ability to quickly and accurately assess the experiences, states, character traits and even intentions of another person. People with psychological insight tend to better understand and interpret the behavior of others. In turn, the views of A.A. Borisova's ideas about psychological insight pay attention to the ability to quickly understand individuals and the relationships between them in a specific situation. This also includes the ability to predict their future behavior [2, 8].

The concept of "psychological insight" was also carefully studied by N.E. Esmanskaya in her study, which carried out an extensive content analysis. The results of this analysis made it possible to identify as many as 33 qualities that describe a person's insight. Among them is the ability to quickly, deeply, objectively and correctly unravel, cognize and understand people and their relationships. The most significant qualities of psychological insight, according to the researcher, are observation, the ability to clearly grasp the thoughts and feelings of other people, as well as active thinking with developed analysis, synthesis and flexibility. It is also important to be able to listen carefully to people, taking into account their age and individual characteristics, which emphasizes the complexity and versatility of this psychological quality [5].

Thus, psychological insight is the ability to understand and analyze complex psychological processes in a person. This term is actively used in the research of modern psychologists to explain the mechanisms of understanding and interpreting human behavior. Psychological insight helps practicing psychologists better understand clients and find optimal approaches to working with them, and is a catalyst for professional growth for specialists in the field of psychology. And in general, the ability to quickly and accurately analyze the behavior and intentions of others can be the key to successful communication and interaction in various areas of a person's life.

Also, an analysis of research in the field of psychological insight allows us to conclude that this professionally significant personality quality has a complex structure, but the structure of this phenomenon and the individual characteristics of

psychological insight, as well as the components of their manifestation in different people, have not been sufficiently studied and developed, because understanding the essence of psychological insight, its structure and component composition are important to take into account for a complete understanding of this phenomenon. Disclosure of these aspects of this quality allows one to open up new prospects for the development of professional and personal qualities of specialists in the field of psychology.

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对人的敏感性是未来心理学家的一项重要专业能力
**SENSITIVITY TO THE PERSON AS A PROFESSIONALLY
SIGNIFICANT COMPETENCE OF FUTURE PSYCHOLOGISTS**

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注解。现代社会对心理学家职业的兴趣日益浓厚，从而产生了心理学家职业重要素质形成的相关性。未来心理学家的这些专业重要能力之一是对另一个人的敏感性(敏感度)。在文章的主体部分，论证了研究这一现象的相关性，并对人类敏感性进行了理论分析。还揭示了对人的敏感性的结构并分析了其组成部分，例如对人的兴趣、同理心、理解和帮助。

关键词：对人的敏感性、对人的兴趣、同理心、理解、帮助。

Annotation. *The relevance of the formation of professionally important qualities of a psychologist is generated by an increased interest in this profession in modern society. One of these professionally significant competencies of future psychologists is sensitivity (sensitiveness) to another person. In the main part of the article, the relevance of studying this phenomenon is substantiated and a theoretical analysis of human sensitivity is carried out. The structure of sensitivity to a person is also disclosed and its components are analyzed, such as interest in man, empathy, understanding and help.*

Keywords: *sensitivity to the person, interest in the person, empathy, understanding, help.*

The problem of training specialists in the psychological and pedagogical profile is currently gaining particular significance. The changes taking place in education, the complication and expansion of the tasks of the professional activities of psychologists and teachers indicate the need for a personal and professional orientation of the educational process in a higher educational institution. The development of personal and professional competencies necessary for future teachers and psychologists is the most important task of training specialists in this area.

One of the key competencies that a specialist in a psychological and pedagogical profile should have is sensitivity to another person. The formation of sensitivity to another (student, pupil, parent, etc.) already at the stage of study at the

university will allow a university graduate at the stage of entering the profession to show a lively, active interest in another participant in the educational process, understand him, build adequate relationships on this basis with others. This, in turn, will help the specialist to be successful in his own professional activities, achieve his goals and contribute to positive changes in the lives of other people.

The term “sensitivity” has quite a few different understandings and interpretations, types and interpretations. V.S. Merlin understands “sensitivity” as a property of temperament [9], V.M. Miniyarov classifies it as a type of character [10]. Researchers distinguish certain types of sensitivity: J. Rest in his works focuses on ethical sensitivity [11], and I.M. Yusupov describes the social. A number of authors distinguish types of sensitivity. O.N. Bakurova describes sensitivity to problems [1], V.G. Maralov - sensitivity to dangers [7].

A significant contribution to the study of this concept was made by T.P. Maralova, who characterizes sensitivity (sensitivity) to a person as a personal characteristic, which manifests itself in the ability to distinguish another person as a significant subject of interaction without experiencing antipathy or indifference to him. T.P. Maralova in his works describes the structure of sensitivity to a person, which includes the following elements: interest in another person, empathy, understanding and help [8].

Consider the structural components of human sensitivity in more detail.

The motivational-target element of sensitivity is interest in another, characterized by the ability of a person to make another the object of his attention. In his dissertation research, E.N. Kuznetsova considers interest in a person as the most important value of psychological and pedagogical interaction [6]. G.F. Tulitbaeva describes the concept of “social interest,” defining it as a personal quality, expressed in the focus of attention on the needs and feelings of another person [14].

The emotional component of sensitivity to a person is empathy, manifested in the ability to empathize and sympathize with another person. She is one of the basic concepts in humanistic psychology. K. Rogers defined empathy as the ability to “be with another person,” to respond sensitively to all changes that occur in him, while remaining himself [12]. The works of many researchers describe the psychological conditions for the formation of empathy in various groups: students of the pedagogical college, educational psychologists, teachers. E.V. Karpova and her colleagues developed and tested a new method of forming empathy among students - future teachers - a method of empathizing the situation, which is based on the perception and analysis of situations from real life, as well as on the interpretation of artistic tests [4].

Comprehension is the cognitive component of human sensitivity. Through understanding, a person can analyze the emotional and behavioral characteristics of another person, as well as interpret the reasons that contributed to certain be-

havioral and personal manifestations. In Russian psychology A.A. Bodalev was one of the first to draw attention to the problem of human understanding. The phenomenon of understanding the other was described and analyzed in more detail by N.I. Shevandrin, who argued that understanding the other is carried out through clarification, interpretation, survival and the ability to be transferred to the inner world of the other [13]. Understanding a person is an intellectual process, it is aimed at forming ideas about the individual characteristics of a perceived person and the motives of his actions. Understanding is a process that is based on the art of interpretation [3].

The behavioral component of human sensitivity is assistance, the purpose of which is to return the person experiencing difficulties to the “original” state, or a state better than the original. Caring for another person is the most famous type of assistance, it refers to activities aimed at promoting someone’s good [2]. The article by N.V. Kukhtova refers to the so-called prosocial behavior reflected in actions that are committed in order to benefit another. She conducted an empirical study, the result of which is the identification of the structural components of a prosocial personality and concluded that the results obtained can be used to build programs to develop the necessary professional qualities of specialists in assisting professions [5].

Theoretical analysis of scientific publications allows us to conclude that sensitivity to a person is a personal characteristic manifested in the ability of an individual to single out another person as a significant subject of interaction without feeling antipathy or indifference to him.

The problem of sensitivity to humans is relevant, especially in human-to-human occupations. Future specialists in psychology and pedagogy should have not only theoretical knowledge in their field, but also a set of professionally important qualities. One of these characteristics is sensitivity to another person as the ability to be imbued with the experiences of another person, to show interest in his personality, as well as provide the necessary psychological support and assistance.

In the structure of human sensitivity, four main structural components stand out: interest in a person, empathy, understanding a person and help. Interest in a person is a motivational-targeted component, basic (thanks to this component, one person becomes the subject of another person’s attention). Empathy is an emotional component, thanks to it a person can react to the emotions of another person, feel his condition. Understanding is a cognitive component, consists in a conscious interpretation and identification of the reasons for the behavior and expression of emotions of another person. Help is a behavioral component, its essence lies in the activity response to a person.

Thus, having considered the sensitivity to a person and its structure, we can say that this ability is a professionally important quality of future specialists in the

field of psychology. The formation of components of sensitivity to another is an important task of educational institutions.

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INVOLVEMENT IN EDUCATIONAL ACTIVITIES: THE ROLE OF PSYCHOLOGICAL CAPITAL AND MOTIVATION OF LEARNING AMONG STUDENTS

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注解。 这项研究的相关性在于研究决定学生参与教育和专业活动程度的因素的重要性。 这样的衡量标准是参与可能以某种方式与学生的心理资本和教育动机相关的活动。

关键词: 参与, 心理资本, 教育动机, 学生。

Annotation. *The relevance of the study is due to the importance of studying the factors that determine the degree of involvement of students in educational and professional activities. Such a measure is involvement in activities that may be associated in a certain way with the psychological capital and educational motivation of students.*

Keywords: *engagement, psychological capital, educational motivation, students.*

Due to changes in the global economy and constantly changing technologies, modern higher education is in a state of permanent transformation and reformation [3], accompanied by a change in educational paradigms [9] and crisis phenomena [14], which cannot but affect the nature of students' mastering educational and professional activities. Studying at a university is associated with certain difficulties, the need to withstand stress [26], the ability to rationally allocate and use time [16]. establish interaction with all participants in the educational process [1]. It is important to properly motivate students, create conditions for positive involvement in activities, and activate personal resources.

For the full development of educational and professional activities, along with the acquisition of knowledge, general and special competencies, three characteristics are of particular importance:

- 1) personal activity, one of the indicators of which is involvement in activities;
- 2) motivation of activity, combining external and internal motives of learning;

3) personal resources necessary to achieve goals, where psychological capital plays an important role.

Involvement in activity acts as a manifestation of human activity, characterized by a measure of his involvement in any activity. In particular, Schaufeli W.B. et al. Engagement is defined “as a positive, satisfying state of mind associated with work, which is characterized by energy, dedication and absorption” [27]. Green P.I. et al. Engagement is understood as: “(a) a positive emotional state, which (b) gives a feeling of energy and (c) leads to positive work-oriented behavior” [19].

In the structure of engagement, according to Schaufeli W.B. et al. [27], there are three components: energy, dedication (enthusiasm), and absorption in work. Energy manifests itself in perseverance and a high level of energy during work, despite difficulties. Dedication, in another way, enthusiasm, is characterized by inspiration, pride, accompanied by a sense of the importance of the work being done. Absorption is a deep immersion in an activity with full concentration and dedication.

Most of the research on engagement in activities is devoted to the study of the manifestations of engagement in organizations. For example, it has been proved that involvement in work acts as an indicator of the level of motivation of employees [6], psychological conditions of involvement in work have been identified [22], the relationship of work passion with personal resources and job satisfaction [12], the influence of leadership styles on work engagement and performance [18], as well as the impact of involvement in activities on the level of psychological well-being of employees and their desire to change or not change their place of work [25]. Nevertheless, in recent years, there has been increasing interest in studying the involvement of students of various ages, parents, students and scientific and pedagogical workers in the educational process.

So N.V. Kiselyova [7] studied the involvement of students in continuing education. As a result, characteristic forms of involvement at different stages of education were identified. M.E. Goshin, D.S. Grigoriev and T.A. Mertsalova [5] studied the types of parental involvement in education in connection with the academic performance of schoolchildren. N.G. Maloshonok [10] identified such types of involvement among students as involvement in the classroom; involvement in group work; involvement in educational activities that go beyond the requirements of the teacher; passive type of involvement. Pavlova [13] identified the temporary features of student engagement (short-term, medium-term and long-term engagement), gave a description of her styles. N.V. Garashkina and A.A. Druzhinina [2] devoted their research to the cognitive involvement of students, described the modes of its functioning (passive, active, constructive, interactive), developed an integral criterion of cognitive involvement, through the organization of experimental work, proved the possibility of increasing its level. V.D. Kolychev

and N.A. Budanov [8] developed a technology for assessing the involvement of students and research and teaching staff in the educational process, taking into account a complex of factors of students' and NPR's vital activity. In connection with the introduction of digital distance learning technologies in recent years, research has intensified aimed at identifying the specifics of student involvement in educational activities in a digital educational environment. For example, K.S. Aljedaya et al. the peculiarities of the influence of digital incentives on the academic involvement of students have been revealed [17], M.A. Tanina et al. Based on a survey of a significant number of Russian and foreign students, it is concluded that in the context of the use of digital distant educational technologies, there is a decrease in student involvement in the educational process [15].

As for the motivation of students' learning activities, two theories have become widespread here: the theory of achievement-oriented target orientations and the hierarchical theory of self-determination [11]. According to the theory of self-determination, there are three types of motivation: external, internal and amotivation. It is believed that internal motivation is most closely related to involvement in the educational process. For example, Jang H., Kim E.J., & Reeve J. [20] revealed in schoolchildren the presence of a connection between the type of motivation, needs, social factors, engagement and achievements. A study of the external and internal motivation of students in a Russian sample conducted by T.O. Gordeeva, O.A. Sychev, E.N. Osin [4] showed that students' academic performance and their psychological well-being largely depend on the internal motivation of teaching, which is based on three needs: the need for autonomy, the need for competence and the need for connectivity with other people. In a study undertaken by Karimi S., Sotoodeh B. [21] in a sample of agricultural students from Iran, it was found that these needs have an impact on academic engagement through intrinsic motivation.

Psychological capital is a resource that a person uses in the course of his life. This concept was introduced into scientific use by Luthans F., Youssef C.M., Avolio B.J. [23], who defined it as a psychological state of human development, including four characteristics: self-efficacy, hope, optimism and resilience.

The allocation as units of analysis of the development of any activity, including educational and professional activities of students, activity (involvement), motivation (external and internal) and resources (psychological capital) invariably poses the problem of identifying the nature of their relationship, taking into account the specifics of educational and professional activities, training profiles, etc. Let's turn directly to the works that analyze the relationship between involvement in educational activities, psychological capital and motivation of learning.

The prerequisites for the study of this relationship were laid down in the work of Xanthopoulou D. et al. [28], which revealed the relationship between labor, per-

sonal resources and involvement in work. Psychological capital acts as the most important personal resource. As for the student age, various aspects of the relationship between psychological capital, involvement and academic performance of students are considered separately. For example, Martínez I.M. et al. [24] revealed a positive relationship between academic engagement, psychological capital and academic performance.

Thus, based on the analysis of the literature, a number of questions can be raised. Firstly, to what extent the patterns identified in world psychology regarding the relationship of psychological capital, motivation for learning and involvement in activities are typical for Russian students. Secondly, in most studies, the emphasis is on studying the relationship between involvement in educational activities, internal motivation and psychological capital in students, while the originality of this connection is often left out of the analysis. It is unclear, for example, which components of psychological capital are more closely related to engagement and specific teaching motives. An even more controversial issue is the issue of identifying predictors of student engagement. Thirdly, it is of particular interest to identify the features of the relationship between all these parameters, depending on the profile of students' training. It can be assumed that the structure of engagement, motivation and psychological capital, as well as the peculiarity of their interrelations, will differ, for example, among students of technical and humanitarian fields of study.

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浆果酵母的分离和表征
ISOLATION AND CHARACTERIZATION OF YEAST FROM BERRIES

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抽象的。目前,分离新的酵母菌株以扩大发酵饮料的范围具有前景。在这项工作中,将1毫升石榴汁和1毫升从浆果中提取的蓝莓汁接种到麦芽汁中,然后在萨氏固体培养基上传代培养以纯化酵母菌落。培养皿在 30°C 下孵育 72 小时。该研究使用简单的微生物技术从浆果中分离出两种酵母菌株。

关键词: 酵母、浆果、沙氏、麦芽汁、菌株、显微镜检查。

Abstract. *Currently, there are prospects for isolating new yeast strains to expand the range of fermented drinks. In this work, 1 ml of pomegranate juice and 1 ml of blueberry juice obtained from the berries were inoculated into the wort, and then subcultured onto Sabouraud's solid medium to purify the yeast colony. Petri dishes were incubated for 72 hours at 30°C. The study isolated two yeast strains from berries using simple microbiological techniques.*

Keywords: *yeast, berries, Sabouraud, wort, strain, microscopy.*

Introduction: currently in Russia there are many small enterprises creating drinks with new, atypical taste profiles. One of the tasks is to attract consumers to their products. It can be solved in different ways, such as packaging design, new flavors, or the use of innovative technologies [1,2] in the production process. In addition, one of the possible ways to solve this problem is to use yeast strains to obtain a drink with a new flavor and aroma profile. Technologies for producing drinks by spontaneous fermentation have long been known [3] (traditional Belgian varieties Gueuze, KRick Lambic and Framboise). However, nowadays manufacturers prefer to use pure cultures of yeast strains, which allow them to achieve stable, repeatable results. Finding new yeast strains allows us to create fermented drinks with new flavor profiles.

New strains of yeast can be isolated from fruits, berries and other parts of plants; for example, researchers have isolated yeast from hop inflorescences *Bretanomyces*^[4,5], the use of which allows you to transform the aroma of hops and obtain drinks with a new sensory profile.

The purpose of the study was to isolate yeast strains from berries and study their microbiological characteristics and the flavor and aroma profile of drinks obtained from them.

Methods.

Blueberries and pomegranates purchased from a retail chain were used as an object for isolating yeast. The berries were crushed, water was added in a 1:1 ratio, and thermostated at a temperature of 28°C for 7 days. The inoculum obtained from the berries was added 1 cm³ into two conical flasks with 100 cm³ of malt wort with a dry matter content of 10% and incubated for 24 hours at a temperature of 30°C on a shaker. Then, multiple dilutions were subcultured using an exhaustive streak onto solid Sabouraud medium and incubated for 48 hours at 30°C in order to obtain single colonies for further morphological identification. The yeast strain *Saccharomyces cerevisiae* isolated from a sample of dry wine yeast was used as a control.

For the morphological description of yeast cells, microscopy was performed at a magnification of 40x. The sample preparation was prepared using the crushed drop method.

For the sensory profile, yeast biomass was grown in YPD broth and added to apple juice with a dry matter content of 10%. Organoleptic analysis was carried out in accordance with GOST ISO 13299-2015 [6].

Materials.

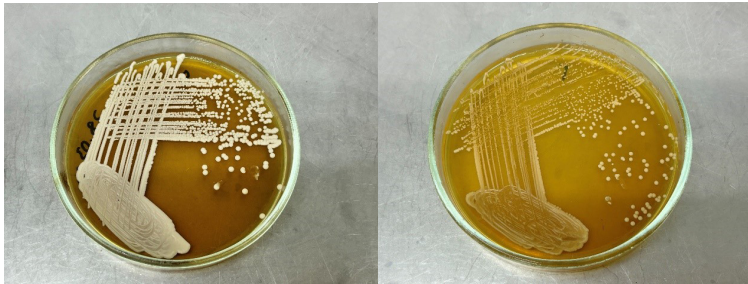
The malt wort used to ferment the yeast was filtered and sterilized in an autoclave for 30 minutes at 0.5 atm.

Sabouraud's medium, consisting per 1 liter of dry enzymatic peptone (7.0 g), enzymatic soy flour hydrolyzate (3.0 g), crystalline hydrated glucose (40.0 g), autolyzed clarified yeast extract (4.0 g), microbiological agar (12.0 g), sterilized in an autoclave for 30 minutes at 0.5 atm. After cooling to a temperature of 46-49°C, the medium was poured into Petri dishes.

YPD broth, consisting in 1 liter of dry enzymatic peptone (10 g), crystalline hydrated glucose (20 g), clarified autolyzed yeast extract (10 g), was sterilized in an autoclave for 30 minutes at 0.5 atm. After cooling the broth to 46-49°C, 100 cm³ was poured into 250 cm³ conical flasks.

Results.

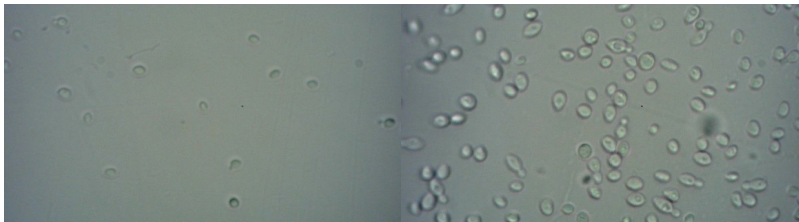
Yeast isolated from blueberries and pomegranates formed convex, round, matte colonies with a smooth cream-colored edge with a diameter of 3-5 mm on Sabouraud's dense medium [Fig. No. 1].



A B

Figure 1. Yeast colonies from blueberries (A) and from pomegranate (B) on Sabouraud's dense medium.

Microscopic examination of the yeast revealed an oval shape of the cells. The size of yeast cells from blueberries was 3 mm, and yeast cells from pomegranate were 4.5 mm [Fig. No. 2].



A B

Figure 2. Yeast cells from blueberries (A) and pomegranate (B) under a microscope at 40x magnification.

The isolated yeast was used as an inoculum to produce a fermented apple juice drink. An organoleptic analysis was carried out using the following descriptors: sweet, berry, yeast, acetone, and a profilogram was constructed [Fig. No. 3].

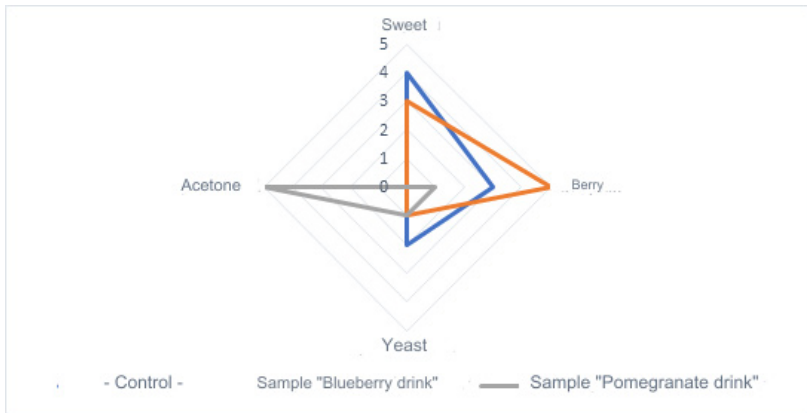


Figure 3. Profigram showing the odor profile of the obtained samples.

Discussion.

From Figure 1 it can be seen that the yeast colonies isolated from blueberries and pomegranates are similar in colony shape, color and size to the genus *Saccharomyces cerevisiae*.

By comparing the morphological features of yeast cells obtained by microscopy, differences in the shape and size of yeast cells from blueberry and pomegranate are observed. Blueberry yeast cells are smaller in diameter than pomegranate yeast cells.

From Figure 3 it can be seen that the sample obtained from blueberries is close to the aroma of the sample obtained from wine yeast. The sample obtained from blueberries has the most pronounced berry tone. In addition, the sample obtained from pomegranate revealed the aromatics of the acetone solvent.

Conclusions.

Thus, a yeast strain was isolated from blueberries, which has a new aroma profile that is promising in the production of fermented drinks.

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正痘病毒属成员之一的抗体保护水平阈值的测定
**DETERMINATION OF THRESHOLD VALUE OF PROTECTIVE
LEVEL OF ANTIBODIES TO ONE OF MEMBERS OF
ORTHOPOXVIRUS GENUS**

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注解。1980年后大规模疫苗接种的停止导致大多数人不仅对天花而且对人畜共患正痘病毒缺乏保护性免疫力。目前，人们对正痘病毒感染的兴趣受到2022年全球猴痘爆发的推动。由于这种感染传播的威胁日益增加，不仅需要在其流行国家，而且还需要在其他非流行国家对人们进行免疫接种。世界各国。尽管如此，在研究疫苗接种对抗病毒感染的有效性时，主要问题是抗体滴度可以提供针对疾病的保护。抗体保护水平的测定是评估受试药物保护性的最可靠标准。在这项工作中，我们确定了痘苗病毒抗体保护水平的阈值。

关键词：痘苗病毒，IgG，VNA，保护滴度。

Annotation. *The cessation of mass vaccination after 1980 has resulted in the majority of people lacking protective immunity not only to smallpox but also to zoonotic orthopoxviruses. Currently, interest in orthopoxvirus infections is driven by the global outbreak of monkeypox in 2022. Due to the increasing threat of the spread of this infection, there is a need to immunize people not only in its endemic countries, but also in other non-endemic countries around the world. Despite this, when studying the effectiveness of vaccination against viral infections, the main question is what antibody titer provides protection against the disease. Determination of the protective level of antibodies serves as the most*

reliable criterion for assessing the protectiveness of the test drug. In this work, we determined the threshold value of the protective level of antibodies to the vaccinia virus.

Keywords: *vaccinia virus, IgG, VNA, protective titer.*

Introduction. The problem of orthopoxvirus diseases, in particular monkey pox, still remains relevant. The most reliable protection against this viral infection is vaccination, in which vaccinated individuals develop specific protective immunity. To date, there are quite a lot of publications on the effectiveness of specific prevention [1-3]. The cessation of mass vaccination against smallpox after 1980 has meant that most people are now immune not only to this virus, but also to other zoonotic orthopoxviruses, including monkey pox virus.

Despite the general nature of the development of immunity after vaccination, the immune response in each person has individual characteristics. The concept of a protective level of antibodies is conditional, since anti-infective immunity can be effective even if the level of antibodies does not reach the protective level, while the presence of an established “protective” amount of antibodies does not always guarantee sterile immunity. However, when studying the effectiveness of vaccination against viral infections, the main question is what antibody titer provides protection against the disease. Determining the level of antibodies when planning and during vaccination (correction of vaccination) can prevent excessive immunization of persons with an existing “protective” level of antibodies and allows one to determine the contingent of persons subject to vaccination: without antibodies or with a low level [4, 5].

The purpose of the study is to demonstrate in an experimental model of infection *in vivo* the antiviral activity of specific antibodies with different titers and to determine the value of the protective level.

Materials and methods. The Western Reserve (WR) strain of vaccinia virus was used in this work. The vaccinia virus was grown on Vero E6 cells. The infectious titer was determined by the plaque formation method. 10-fold dilutions of the virus-containing suspension were applied to a monolayer of Vero E6 cells grown in 6-well plates. Enumeration was carried out on plaques on days 3–4 after infection.

In vivo experiments were carried out on a model of 4-6-week-old mixed-sex mice of the DBA/2 line, weighing 18-26 g. The mice were divided into 6 groups of 6 animals each. Animals were immunized intramuscularly with vaccinia virus (0.1 ml of virus-containing suspension) in the following doses: 3, 30, 300, 3000 and 30,000 plaque-forming units (PFU) per animal. Control mice were injected with pure culture medium. Blood was collected 21 days after immunization and serum was obtained by sedimentation of formed elements using centrifugation. Immu-

nized and control animals 32 days after immunization were infected intranasally with 50 μ l of vaccinia virus at a dose of 8×10^4 PFU (16 LD₅₀); the observation period was 14 days. The animals were kept in vivarium conditions regulated by the Guidelines for the Care and Maintenance of Laboratory Animals. The experiments were carried out in compliance with moral and ethical principles when working with laboratory animals in accordance with the provisions of the European Convention for the Protection of Vertebrate Animals Used for Experimental or Other Scientific Purposes.

Inactivated vaccinia virus was used as an antigen for enzyme-linked immunosorbent assay (ELISA) in an amount of 200 PFU per well. A series of serum dilutions was obtained in twofold steps starting from 1:100 and ending with 1:6400.

Virus neutralizing antibodies (VNA) in sera were determined in a neutralization reaction on Vero E6 cell culture. Blood serum was inactivated for 30 minutes at 56°C; twofold dilutions were prepared starting from 1:5 and mixed with the virus (100 PFU). The mixture was incubated for 1 hour at 37°C, and then added to a monolayer of Vero E6 cells grown in 6-well plates. Enumeration was carried out on plaques on days 3-4 after infection.

All experiments were repeated three times. Statistical processing of the obtained data was carried out using GraphPad and Excel programs. The correlation coefficient between the IgG titer, VNA and the survival of animals in pairs was assessed using the Spearman coefficient at a significance of $p > 0.05$ with the determination of a two-sided probability (p -value).

Results and discussion. At the first stage of the work, we studied the humoral immune response after immunization of animals with different doses of the vaccinia virus. Based on the results of the work, a dose-dependent nature of the formation of humoral immunity was revealed. When mice were immunized with vaccinia virus at a dose of 3 PFU, specific IgG antibodies were detected in three out of six animals; the value of the geometric mean antibody titer (GAT) compared with the control group (non-immunized animals) was not significant ($p = 0.1818$). Specific IgG antibodies were detected in mice 21 days after vaccinia virus immunization for all subsequent doses (Figure 1 A). GMTs were 1:1600, 1:1600, 1:2540, and 1:8063 for doses of 30, 300, 3000, and 30,000 PFU, respectively.

In addition, virus-neutralizing antibodies were determined (Figure 1 B). VNAs were also correlated with the immunizing dose. When mice were immunized with vaccinia virus at a dose of 3 to 30,000 PFU, VNA was detected with a titer of 1:5 to 1:20. GMTs were 1:3.5, 1:5, 1:7.07, 1:10, and 1:10 for doses of 3, 30, 300, 3000, and 30,000 PFU, respectively.

Comparison of the results obtained by ELISA and the neutralization reaction showed a high correlation (correlation coefficient $r = 0.97$, $p = 0.0111$).

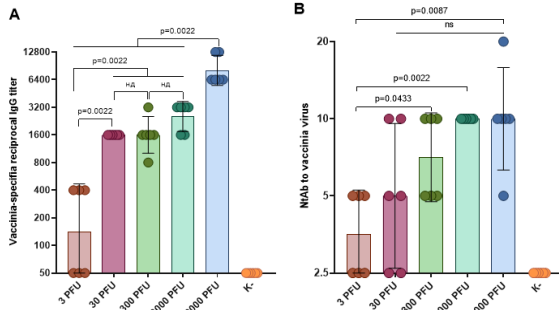


Figure 1. Humoral immune response to vaccinia virus as a function of dose tested. A. Vaccine virus-specific IgG antibody titers measured by ELISA. B. VNA titers in animals immunized to vaccinia virus strain WR.

Values for each study animal are presented as colored circles. The bars represent the geometric mean titer (GMT) of IgG (A) or neutralization titer (B), and the error bars represent the 95% CI.

At the second stage of the work, we determined what level of IgG and VNA is protective during intranasal infection with the vaccinia virus. The survival results are presented in Figure 2. At high doses of 300, 3000 and 30000 PFU, all animals survived (100%). However, at a lower dose of 30 PFU, survival was 50% on day 10 (3 out of 6 animals), and at a dose of 3 PFU, all animals died on day 4. However, no correlation was observed for the survival of animals with IgG (correlation coefficient $r = 0.88$, $p = 0.0667$), but a correlation was present with BNA levels (correlation coefficient $r = 0.94$, $p = 0.0333$).

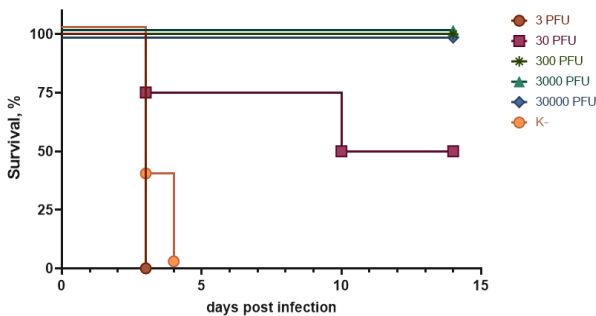


Figure 2. Change in the number of live animals after intranasal challenge for groups immunized with different doses of vaccinia virus.

Thus, this study showed the presence of antiviral activity when using vaccinia virus WR at a dose of 30 PFU to 30,000 PFU, 100% protection was achieved starting from 300 PFU. At the same time, the protective titer of virus-neutralizing antibodies showed a correlation with survival, which allows us to conclude that for 100% survival the titer must be at least 1:5. At the same time, a specific IgG titer of 1:1600 may not guarantee a protective effect against the vaccinia virus, as can be seen from the survival results for doses of 30 and 300 PFU - 50 and 100%, respectively.

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马尔堡病毒糖蛋白粘蛋白样结构域缺失对水泡性口炎病毒载体免疫原性的影响
**EFFECT OF DELETION OF THE MUCIN-LIKE DOMAIN OF THE
MARBURG VIRUS GLYCOPROTEIN ON THE IMMUNOGENICITY
OF A VECTOR BASED ON VESICULAR STOMATITIS VIRUS**

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注解。 人类疾病，特别是传染病和癌症，给公共卫生安全和全球经济带来前所未有的挑战。 新型预防性和治疗性疫苗的开发和销售是人类疾病的首要对策。 目前，重组疫苗正变得越来越普遍。 疫苗有效性的重要指标之一是免疫原性水平。 病毒抗原的不同修饰可以产生不同的免疫反应。 有关病毒抗原各种修饰的免疫原性的数据有助于开发更有效的预防手段。 在这项工作中，我们比较了两种携带不同马尔堡病毒糖蛋白修饰的水泡性口炎病毒的免疫原性。

关键词：马尔堡病毒，免疫原性，糖蛋白，水泡性口炎病毒。

***Annotation.** Human diseases, particularly infectious diseases and cancers, pose unprecedented challenges to public health security and the global economy. The development and distribution of novel prophylactic and therapeutic vaccines are the prioritized countermeasures of human diseases. Currently, recombinant vaccines are becoming increasingly common. One of the important indicators of vaccine effectiveness is the level of immunogenicity. Different modifications of viral antigens can produce different immune responses. Data on the immunogenicity of various modifications of viral antigens can help in the development of more effective means of prevention. In this work, we compared the immunogenicity of*

two vesicular stomatitis viruses carrying different modifications of Marburg virus glycoprotein.

Keywords: *Marburg virus, immunogenicity, glycoprotein, vesicular stomatitis virus.*

Marburg virus disease (MVD) is a serious disease occurring with severe hemorrhagic syndrome. Marburg virus (MARV) causes deadly outbreaks with a high fatality rate. It is responsible for several outbreaks since its concurrent discovery and characterization in 1967 in Marburg, Germany; Frankfurt, Germany; and Belgrade, Yugoslavia (now Serbia). The majority of the MARV outbreaks occurred in Africa [1].

At the moment, there has not been such a large outbreak of Marburg virus as the outbreak of the Ebola virus in 2014-2016. But it is expected that sooner or later such an outbreak will occur, so it is necessary to develop effective means of prevention. Therefore, candidate vaccines against Marburg virus are being developed all over the world. Some of them are currently in various stages of clinical trials. Candidate vaccines include RNA vaccines, DNA vaccines, and recombinant vaccines. One of the promising platforms for recombinant vaccines is the vesicular stomatitis virus (VSV). VSV is enveloped non-segmented negative-stranded RNA viruses belonging to *Rhabdoviridae*. Virion is composed of five structural proteins including nuclear protein (N), phosphoprotein (P), matrix protein (M), glycoprotein (G), and RNA-dependent RNA polymerase (L) [2, 3]. For this vector, there are two major strategies for foreign gene delivery. (1) Deleting the native glycoprotein gene and replace it with a foreign targeted gene [4]. (2) Involving an additional transcriptional unit for foreign antigen while retain the vector glycoprotein gene in the full-length genome [5-7]. Foreign genes could be inserted at different gene junctions of the genome as an additional expression unit. In the first design strategy, the targeted glycoprotein could be displayed on the surface of the recombinant virus. Accordingly, the cell and tissue tropism of the recombinant virus is largely depended on foreign glycoproteins. In cases that the target glycoprotein was similar in the molecular size and function of the vector glycoprotein, first design strategy rendered the recombinant virus ideal for biological growth properties and minimization of anti-vector immunity [8, 9].

In this study, we compared the immune response to vaccination using vectors based on recombinant vesicular stomatitis virus (rVSV) carrying two different forms of the Marburg virus glycoprotein (GP). The first form (VSV-Marb-GP-full) carries a full-length glycoprotein. The second form carries a glycoprotein that lacks the mucin-like domain (VSV-Marb-GP-dMuc). Mucin-like domain (MLD) is rich in proline, serine, and threonine amino acid residues, is heavily glycosylated, and represents one of the most variable regions in the Marburg vi-

rus GP. The MLD is believed to function as a glycosylated shield, protecting the viral GP from inactivation by the adaptive immune system [10]. We assume that removal of the mucin-like domain would enhance the immune response of recombinant VSV-based vaccine.

For this purpose, 7 C57BL/6J mice were immunized with 10^6 plaque forming units (PFU) of either VSV-Marb-GP-full or VSV-Marb-GP-dMuc per mouse. After 21 days, mice were bled and serum was obtained to determine antibody titer (Fig. 1A). The titer of GP-specific IgG was measured using an enzyme-linked immunosorbent assay (ELISA). The virus-neutralizing antibody titer was determined by a plaque reduction neutralization assay. Vero E6 cells (African green monkey kidney epithelial cells) were seeded into 12-well plates. Analysis was carried out 24 hours after achieving a cell monolayer. Serum samples were titrated in two-fold dilutions from a starting dilution of 1:10 up to a final dilution of 1:640. To 100 μ l of diluted sera, 100 μ l of serum-free medium containing 100 pfu of VSV-Marb-GP-full was added. The virus and serum were incubated for 1 hour at 37°C. After, the entire volume was added to the wells of 12-well plates containing Vero E6 cells. As a positive control, 100 pfu of VSV-Marb-GP-full was used. The results were recorded 48 hours after initiation of the assay. Statistical analysis of the data was performed using GraphPad Prism software.

The results of the ELISA assay demonstrated 100% seroconversion in both groups. The reciprocal antibody titer in the VSV-Marb-GP-dMuc group (GMT = 2153) was higher than in group immunized with the VSV-Marb-GP-full (GMT = 362.3) (Fig. 1B). Similarly, the results of the plaque reduction neutralization assay indicated that the titer of neutralizing antibodies was significantly higher in the mice immunized with the VSV-Marb-GP-dMuc (GMT = 289.8) compared to those immunized with the VSV-Marb-GP-full (GMT = 36.23) (Fig. 1C).

We showed that the presence of the mucin-like domain on the glycoprotein structure reduces the humoral immune response to vaccination with VSV-based Marburg virus vaccines in a murine model. Antibodies targeting the MLD domain rarely exhibit viral neutralizing activity, likely due to the fact that this domain is shed prior to receptor binding and because the highly glycosylated nature of the MLD significantly reduces protein expression levels [11]. Apparently, this glycan shield interferes with the production of a large number of antibodies, both general and virus-neutralizing [12].

To sum up, the removal of the mucin-like domain from Marburg virus glycoprotein improves the immunogenicity of this target antigen.

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心血管病患者抑郁与心血管事件关系的热点问题

**TOPICAL ISSUES OF RELATIONSHIP BETWEEN DEPRESSION
AND CARDIOVASCULAR EVENTS IN PATIENTS WITH
CARDIOVASCULAR DISEASE**

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概括。 心血管疾病与多种心理社会因素有着千丝万缕的联系。 抑郁症对心脏病患者的负面影响需要仔细研究。 本综述探讨了心血管病理患者抑郁症的评估方法、抑郁症对心血管疾病及其并发症发展的具体影响，以及体力活动和心理治疗对患者预后的重要性。 积极识别和治疗抑郁症可以降低心血管疾病的发病率。 现有诊断和治疗能力的进一步改进和更新旨在以患者为中心的临床方法。

关键词：心血管风险、抑郁、死亡率、CAD、以患者为中心的方法。

Summary. *Cardiovascular disease is inextricably linked to multiple psychosocial factors. The negative impact of depression on cardiac patients requires careful study. This review examines methods for assessing depression in patients with cardiovascular pathology, the specific effects of depression on the*

development of cardiovascular diseases and their complications, as well as the importance of physical activity and psychotherapy on the prognosis of patients. Actively identifying and treating depression can reduce the rate of cardiovascular disease. Further improvement and updating of existing diagnostic and therapeutic capabilities is aimed at a patient-centered clinical approach.

Keywords: cardiovascular risk, depression, mortality rate, CAD, patient-oriented approach.

Introduction

Cardiovascular disease (CVD) represents a significant clinical and societal burden, and CVD is the leading cause of mortality worldwide. According to 2024 statistics released by the American Heart Association and the National Institutes of Health, approximately 127.9 million Americans (48.6%) aged ≥ 20 years have cardiovascular disease, including coronary artery disease, heart failure, stroke or hypertension [1].

In turn, depressive disorder is one of the most common mental illnesses in the United States and around the world. According to 2021 statistics, 8.4% of all U.S. adults suffer from depression, which is more than 21 million people [2].

Questions about the relationship between anxiety levels, stress factors, social and economic status, as well as cardiovascular diseases are increasingly facing the medical community. In the last decade, the importance of psychosocial factors in the occurrence of cardiovascular diseases has been emphasized. An increasing number of studies recognize the association between psychosocial characteristics and cardiovascular disease morbidity and mortality [3], [4].

Thus, the patient burden associated with cardiovascular disease and depression continues to require careful study as well as targeted interventions.

Purpose of the review: to evaluate the effect of depression on the development of cardiovascular diseases and their complications in patients with atherosclerosis-associated cardiovascular pathology.

Materials and research methods: This work is based on sources of modern literature, the materials of which were published from 2014 to 2024. in English and Russian in online scientific libraries: PubMed (<https://pubmed.ncbi.nlm.nih.gov/>), Cocrane Library (<https://www.cochranelibrary.com/>), Oxford Medicine Online (<https://academic.oup.com/>), Springer (<https://link.springer.com/>), library (<https://www.elibrary.ru/defaultx.asp>)

Results

To identify depression in clinical practice, it is common to use scales and questionnaires. The European Society of Cardiology recommends screening tools that assess depression, anxiety and insomnia, such as the PHQ-9 (Patient Health Questionnaire). In addition, the Hospital Anxiety and Depression scale (HADS)

has become widespread in practical healthcare. This questionnaire was originally developed by the authors to assess anxiety and depression specifically among non-psychiatric patients. The HADS includes 2 subscales (HADS-A for anxiety and HADS-D for depression), each consisting of 7 questions with 4 answer options, scored from 0 to 3 points [5]. It is used as a primary screening tool with high discriminant validity in determining the risk of anxiety and depressive disorders.

In addition, there are tools that allow the assessment of cardiovascular risks taking into account the presence of mental disorders in patients. Thus, the EUROASPIRE risk scale is most widely used and is used to assess the 2-year risk of recurrent events in patients with stable coronary artery disease. Validation of the current version of the scale includes a cohort of patients from the Russian Federation (studies EUROASPIRE IV, EUROASPIRE V), which makes it more predictively reliable for use by domestic specialists [6].

It is important to note that cohorts of patients with depression exhibit elevated levels of C-reactive protein and other immune dysfunctions, which may contribute to endothelial dysfunction and altered platelet aggregation. Emotional tension and stress can lead to dysregulation of the autonomic nervous system. Depression leads to mental stress, and research has shown that mental stress leads to activation of the sympathetic nervous system of the heart. This change leads to a decrease in blood supply to tissues, an increase in heart rate, left ventricular hypertrophy, myocardial infarction and sudden cardiac death [7].

Hughes et al. [8] wrote an interesting article. It describes a model of psychosocial management of cardiac rehabilitation that clinicians can use in their practice. When using this “CREAT” (cardiac rehabilitation and exercise training) model, the level of cardiorespiratory fitness improved, this led to noticeable reductions in depression rates and the prevalence of depressive conditions, and reduced the mortality rate caused by depression [9].

And the MESA (Multi-Ethnic Study of Atherosclerosis) study by the American Society of Science found that increased CVD risk due to depression and excessive life stress contribute to an increased risk of cardiovascular disease by increasing unhealthy behavior and reducing adherence to treatment. Unhealthy behaviors included overeating, smoking, drinking alcohol, and lack of physical activity [10].

Currently, many studies have been devoted to the effect of stress on a number of diseases. According to the data obtained, an association of increased anxiety with pathologies such as hypertension, diabetes and obesity was identified. The following research findings are also interesting: when adjusting for other risk factors for cardiovascular (CV) diseases, stress continued to be associated with an unfavorable CV prognosis, which suggests the significance of its contribution to cardiovascular aging [11].

At the same time, the SUPRIM project, carried out by colleagues from Finland, assessed the role of managing psycho-emotional stress in patients with cardi-

ovascular diseases. Thus, it has been demonstrated that correction of psychosocial factors can reduce the incidence of fatal and non-fatal CV events by 41% [12].

Discussion

Improved forecasting of the risk of morbidity and mortality from cardiovascular diseases is possible thanks to an integrated approach to assessing a number of facts using up-to-date risk scales. In addition, it is important to note that cardiovascular risk validation tools, which allow assessing the psycho-emotional state of the patient, are important in practical healthcare. It is worth emphasizing that these scales and questionnaires make it possible to minimize the costs of screening for mental disorders, and their additional advantage is that special training (additional knowledge and skills) is not required to interpret the results.

Behavioral patterns among patients with depression likely contribute to the development or exacerbation of traditional cardiac risk factors.

Assessment of stress and stress-induced psychosocial factors is necessary to identify a focus group of patients with a higher risk of CVD and implement timely prevention. Additionally, your anxiety level can have a direct impact on your sleep quality. Therefore, an integrated approach with the involvement of related specialists (psychotherapist, somnologist) seems very promising for improving the prognosis of CVD.

Psychotherapy can have a complex impact as part of a preventive strategy. So, it can have a positive effect on a person's psycho-emotional state. At the same time, competent support helps the specialist maintain the patient's compliance with modification and adherence to a healthy lifestyle, as well as to the therapy. According to the studies reviewed, patients in the psychotherapeutic treatment group were 3 times more likely to quit smoking. It should be noted that the mortality rate of patients with high levels of psychosocial stress is significantly reduced with regular physical training. Perhaps an important future direction for research is to evaluate the impact of treated depression on the development of cardiovascular disease.

Thus, psychological health and depressive disorder are increasingly recognized as factors that influence physical health and, in particular, cardiovascular disease. This review examines the significant association between the presence of depression and subsequent development of cardiovascular disease, as well as mortality from cardiovascular disease, compared with individuals without depression. Actively identifying and treating depression can reduce the rate of cardiovascular disease. This may be a cost-effective public health intervention, but further research is needed to prove this.

Conclusions: The review data presented demonstrate the importance of further studying the effect of depression on the development of cardiovascular diseases and their outcome. It is advisable to further improve existing diagnostic

approaches, as well as evaluate their informativeness and the possibility of application in clinical practice.

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现代汽车制造中前景广阔的四轴转向架
**PROMISING FOUR-AXLE BOGIES IN MODERN CARRIAGE
BUILDING**

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注解。四轴车厢转向架的开发需要深入分析并仔细选择结构材料和连接图，这将使得从经济角度来看最有前途的八轴车厢成为可能。使用连接梁将双轴转向架连接成一个四轴模块，可以实现结构所需的强度和刚度。这反过来又保证了轨床上荷载的分布更加均匀，从而减少轨道磨损并提高交通安全。

将连梁连接到转向架的选项可能会根据设计要求和操作条件而有所不同。最常见的方法是螺栓连接，以便轻松更换磨损的部件和焊接，以实现最大的连接强度和刚度。具体方法的选择是根据预期的运行载荷和整个结构的耐久性要求来确定的。

运行动态测试在铁路车辆测试领域占有特殊的地位。它们是在沿着具有各种人造颠簸的各种类型的轨道行驶时进行的。此类测试对于评估汽车的动态特性和确保铁路运输的安全是必要的。

通过分析研究结果，可以追溯缓冲器特性与影响货运列车运行的载荷水平之间的关系。值得注意的是，选择最佳类型的装置可以显著影响磨损的减少并提高铁路运输的运行安全性。

关键词: 货车转向架、四轴转向架、连接梁、八轴车、分析、强度。

Annotation. *The development of four-axle carriage bogies requires in-depth analysis and a careful approach to the selection of structural materials and connection diagrams, which will make it possible to create the most promising eight-axle carriages from an economic point of view. Connecting biaxial bogies into one four-axle module using a connecting beam allows you to achieve the required strength and rigidity of the structure. This, in turn, guarantees a more*

even distribution of loads on the rail bed, thus reducing track wear and increasing traffic safety.

Options for attaching coupling beams to bogies may vary depending on design requirements and operating conditions. The most common methods are bolting to allow easy replacement of worn components and welding to achieve maximum strength and rigidity of the connections. The choice of a specific method is determined taking into account the expected operating loads and the durability requirements of the entire structure.

Running-dynamic tests occupy a special place in the field of testing railway cars. They are carried out when driving along various types of tracks with various artificial bumps. Such tests are necessary to assess the dynamic characteristics of cars and ensure safety in railway transport.

By analyzing the research results, the relationship between the characteristics of draft gears and the level of load, which affects the operation of freight trains, can be traced. It is important to note that choosing the optimal type of device can significantly affect the reduction of wear and increase the operational safety of railway transport.

Keywords: *freight car bogie, four-axle bogie, connecting beam, eight-axle car, analysis, strength.*

Introduction

Given the limited ability of the railway track to absorb increased axial loads, the main direction for increasing the weight of the train was considered the creation of multi-axle cars. Starting from the first stage of production of six-axle gondola cars at the Ural Carriage Works and the Kryukov Carriage Plant, difficulties arose in the development of three-axle bogies, preventing the creation of such cars. Solving these problems required many design and manufacturing improvements.

As a result of many scientific research and technical developments, eight-axle car designs were created based on two-axle bogies of the TsNII-Kh3-O type, which were later called the “18-100” model. The production of such cars required not only the development of production facilities, but also the creation of the necessary infrastructure, including car dumpers and the modernization of engineering systems for servicing eight-axle cars.[1]

The technical and economic parameters of freight cars are determined depending on the structure of freight turnover, the conditions for loading and unloading operations and the safety of the transported cargo, the characteristics of the superstructure of the track and artificial structures, the overall capabilities of operating areas, types of traction and the maximum permissible weight of the train and speed, costs production of a new type of car and costs for technical maintenance of cars during operation.

There are options for eight-axle gondola cars model 12-5991 (gondola car “URAL” with a load capacity of 150 tons and a body volume of 176 m) and model 12-5992 (gondola car “BAM” with a load capacity of 151 tons and a body volume of 166 m³), which are a rigid bunch of two four-axle cars.[2]

To ensure efficient operation of railway transport, it is necessary to take into account the axial normative and actual loads of cars. Based on statistical data reflected in a number of research works, the design of eight-axle cars provides a linear load of 43% more than four-axle cars. Similar studies on the production and operation of tanks are given in the work[3]

The use of modern eight-axle cars leads to significant savings in both operating costs and capital investments in transportation. The main factor causing this is the increase in train weight due to increasing linear loads. The greatest effect is achieved when the train consists entirely of eight-axle cars.

Car configurations are a design of standardized units, which are subject to a number of requirements for the choice of linear dimensions [4].

When calculating the length of rolling stock for station receiving and departure tracks of 1050 meters, it is necessary to take into account not only the size of the cars, but their carrying capacity and useful length. Taking into account the full use of these parameters, the gross weight of the train will be different for different types of cars. For example, for four-axle gondola cars and tanks it will be 6070 and 6910 tons, respectively, and for eight-axle ones - 8290 and 7950 tons.

It should be noted that as the length of receiving and departure tracks increases, the capacity of the train also increases. This allows you to increase the efficiency of transportation and reduce the cost of transporting goods. However, it is necessary to take into account not only the length of the tracks, but also the state of the infrastructure and the ability to maneuver trains at the station.

When developing an eight-axle car, the choice of design for four-axle bogies is of particular importance, since they provide support and movement of the car along the rails. The four-axle bogie is a complex engineering system designed to take into account high loads and operating features in various operating conditions.

One of the design features of a four-axle bogie for an eight-axle car is its ability to distribute the load evenly between the axles, which ensures motion stability and increases the car's carrying capacity.

When assembling a four-axle carriage bogie from two-axle bogies, the two-axle bogies are connected using a connecting beam. This allows you to create a structure with the necessary rigidity and strength to transfer significant loads from the car to the rails.

Design features of such an assembly include the use of special elements, such as bearings and sliders, which provide support and stable position of the connect-

ing beam and biaxial bogies. In addition, the long kingpin center bearing plays an important role in the assembly and operation of the four-axle bogie.

When assembling a four-axle bogie, the car's center of gravity does not necessarily rise, since the structure of the bogie and its connection to two-axle bogies are designed to optimally distribute loads and maintain stability of the car's center of gravity. However, the design and assembly of bogies takes into account the influence and distribution of the weight of the car to ensure safe and efficient movement on the railway tracks.

The design of the connecting beam, which acts as a connecting element between two biaxial bogies, plays an important role. The beam must be designed to withstand high loads and prevent excessive bending or deformation during service.

The bogies are reinforced with high-strength materials and advanced welding techniques, which together contribute to the overall safety and durability of the car bogie. However, the total weight of the beam should be minimized.

An important stage in the development of cars is multiple tests, which include a cycle of strength, dynamic and operational tests. In this case, special attention is paid to certain operating modes:

- 1) Tests on the patency of humps of sorting slides;;
- 2) Tests on various sections of railways: bridges, crossings, etc.;
- 3) Operational tests in closed routes with unloading on car dumpers.

For a deeper understanding of the testing process and its significance, one can refer to literature studies such as the work[5]. These studies allow us to better understand the specifics of the tests and their impact on the further operational use of cars.

Among the possible options, we can consider prototypes of cars with biaxial bogies supported on sliders, connected to each other by a special beam. The main working part of the slide is the cap, which is installed on the corresponding support. The cap participates in the power circuit of loads transmitted from the body to the trolley[6]. Any modification must be evaluated in comparison with the standard layout with central support on the connecting beam, as well as comparisons in terms of dynamic parameters with four-axle cars on two-axle bogies. When conducting research, special attention must be paid to assessing the impact of the train on the track.

A design option using a wedge balancing system is already known, when roller bearings and a self-aligning split wedge are used. With this design, horizontal forces from the car body to the bogie are transmitted through the connecting beam.

A frameless design of carriage bogies is also known, containing two wheel sets with axle boxes, spring suspension springs mounted on the axle boxes. The connection of the wheel set with each other and between the thrust brackets with which the axle boxes are equipped is carried out by means of installed rods in such

a way that their axes do not intersect with all the axes of the wheel sets of spring suspension, and which are offset relative to the vertical planes passing through the axes of the wheel sets by the amount

$$C = \frac{\pi}{P} \cdot \left(\sqrt{r^2 - (b + x)^2} - H \right) \pm x$$

where x is a small longitudinal displacement of the axle box in the curve;

r is the distance between the axle of the wheelset and the nearest hinge of the rod

b - horizontal distance between the axle of the wheelset and the nearest hinge to the rod

H - vertical distance between the spring support of the spring suspension on the boxes and the axles of the wheel sets

P - vertical load from centrifugal force on spring suspension springs resting on axle boxes

P - forces in rods from vertical load P

The rods are equipped with tension devices. Hinge connections are provided that connect the wheel sets to each other and ensure the rotation of the wheel sets relative to the vertical and longitudinal planes.[8]

Four-axle bogies are used in heavy-duty eight-axle cars and tanks. The connecting beams in the gondola car are cast, while the tanks use stamped structures. The cast connecting beam is a box-section casting made from open-hearth steel. The welded beam from stamped elements includes thrust bearings and heels and is made of steel grade 09G2F-15. This option is a more rational design, which provides longitudinal and transverse stiffeners [9].

In existing structures, footplates are welded along the edges of the connecting beam, with which it rests on the bearings of biaxial bogies. Due to the installation of the connecting beam, the lifting height of the center of mass of the body will shift slightly in the vertical direction.

Therefore, when developing the design of four-axle bogies, it is necessary to take into account the additional lift of the body. As shown in the work [10], based on the analysis of data on the safety factor of wheel stability against derailment, at speeds over 100 km/h there is a danger of derailment with a center of gravity height of more than 1510 mm. The movement of this car is dangerous at speeds of 110-120 km/h at almost any height of the car's center of gravity. At low speeds of 30-40 km/h, the dangerous height of the center of gravity is more than 1510 mm.

Thus, traffic safety is ensured in the range of operating speeds and more up to 100 km/h with a body center of gravity height of no more than 1510 mm.

Conclusion

When designing and manufacturing bogies for eight-axle cars, an important aspect is the creation of a highly reliable and durable structure that can withstand

extreme loads. For this purpose, the connection of four-axle carriage bogies from biaxial elements is used using specialized connecting beams. These beams play a key role not only as connecting elements, but also significantly increase the rigidity of the entire structure, creating a single and durable system that can withstand significant operating loads.

Efficient connection of biaxial elements in carriage bogies is an integral part of the process of creating a reliable railway vehicle. Such structures must be designed and manufactured to meet specific operating conditions to ensure safety and comfort for passengers and cargo. Such engineering solutions play an important role in ensuring the sustainable operation of railway transport, transportation efficiency and overall system reliability. During the assembly process, particular importance is attached to the accuracy of connections, since even minor inaccuracies can lead to uneven distribution of loads and, as a result, to rapid wear and need repair. Therefore, it is important to use high-precision equipment and control techniques at all stages of production.

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基于LoRA模块的无线信道数码自锁报警系统状态监测系统概述
**OVERVIEW OF THE SYSTEM FOR MONITORING THE STATUS
OF A NUMERICAL CODE AUTO-LOCKING ALARM SYSTEM
USING A RADIO CHANNEL BASED ON THE LORA MODULE**

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注解。这篇科学文章致力于使用 LoRa 和 Arduino 模块通过无线电通道进行诊断来开发继电器柜保护系统。本文讨论了一种通过安装专门的耦合 LoRa 模块来检测和防止俄罗斯铁路继电器柜运行中可能出现的故障的方法，该模块可监控铁路自动化和远程机械设备的状况并通过无线电通道传输数据。描述了开发这些模块并将其集成到继电器柜监控系统中的过程。对系统的实验和测试结果进行分析，证实了其在保证电力设备安全稳定运行方面的有效性和可靠性。获得的结果可用于创建和改进能源设施的保护和监测手段。

关键词：继电器柜保护、诊断、无线电通道、LoRa、Arduino、监控模块、电气设备安全、控制系统、控制、效率、可靠性、实验、测试、能源设施。

Annotation. This scientific article is devoted to the development of a protection system for relay cabinets using diagnostics via a radio channel using LoRa and Arduino modules. The paper discusses a method for detecting and preventing possible failures in the operation of relay cabinets on Russian railways by installing specialized coupled LoRa modules that monitor the condition of railway

automation and telemechanics devices and transmit data over a radio channel. The process of developing and integrating these modules into the monitoring and control system of relay cabinets is described. The results of experiments and testing of the system are analyzed, confirming its effectiveness and reliability in ensuring the safe and stable operation of electrical equipment. The results obtained can be used to create and improve means of protection and monitoring of energy facilities.

Keywords: *protection of relay cabinets, diagnostics, radio channel, LoRa, Arduino, monitoring modules, safety of electrical equipment, control systems, control, efficiency, reliability, experiments, testing, energy facilities.*

The problem of vandalism and outside interference in the operation of railway automation and telemechanics poses a serious challenge to the reliability and safety of railway transport and the operation of service systems. Damage to automation and telemechanics objects can lead to the impossibility of controlling train movement, switching signals, equipment of signaling devices and power supply elements. Combating the problem of vandalism requires the introduction of additional and innovative security measures to ensure the safety of both domestic transport and international rail traffic.

As part of the solution to this problem, it was proposed to introduce a system for monitoring the state of a numerical code automatic blocking alarm system using a radio channel based on a LoRa module. This solution will allow you to monitor the status of railway automation and telemechanics devices remote from the station, namely on the route in relay cabinets.

This system will consist of a metal case with noise immunity, thanks to which it will be able to function properly even in a complex electromagnetic environment [1, 2], an Arduino Mega platform built on the ATmega2560 microcontroller [3, 4], connecting wires, LoRa modules interfaced between itself, temperature, smoke, volume sensors, as well as voltage, hall, and humidity sensors. The device will be mounted in the relay cabinet in the side part, powered from the power bus of the centralization and blocking alarm devices. Since the programmed LoRa modules will be interconnected through software code and an antenna, which allows creating a radio communication channel. Through this channel, the modules will exchange both data on the state of the relay cabinet itself, and data on the state of the equipment located directly inside the relay cabinet, that is, it will be possible to promptly respond to failures and other malfunctions of automation and telemechanics devices [5], as well as promptly respond in cases of vandalism. Prompt response to vandalism and disruption of the normal functioning of numerical code automatic blocking systems will reduce cases of forced downtime of rolling stock and increase the capacity of lines.

The stage will be equipped with a chain of modules installed at signal points, and if control over one of the points is lost, information will be transmitted to the electrical centralization post located at the station. Figure 1 shows a diagram of the system operation.

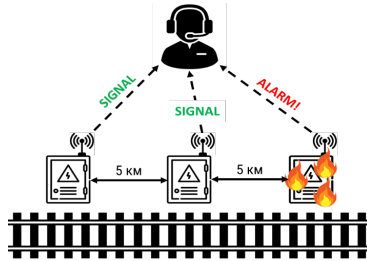


Figure 1. Scheme of operation of the control system in various situations

Features of the reviewed system include:

1. Sending information about the state of relay equipment to the dispatcher's log. The system periodically transmits information to promptly identify problems and take measures to prevent them.
2. Detection of tampering or arson. If a tampering or arson of the relay cabinet is detected, the system goes into alarm mode, turns off the power to the relay equipment and transmits an alarm signal to the dispatcher.

System components:

1. System control using a microcontroller. The system is controlled by a microcontroller, which provides all functions of monitoring, data transmission and protection of relay equipment, processes information and makes decisions for the efficient operation of the system.
2. Monitoring the condition of equipment: The system monitors the condition of equipment in the relay cabinet using hall sensors, voltage, temperature, humidity, and smoke.
3. Detection of unauthorized actions. The system quickly responds to unauthorized actions of opening or setting fire to the relay cabinet.
4. Protection of relay equipment. When an alarm is activated, the system cuts off the power, preventing damage from a possible short circuit.
5. LoRa modules. For communication between the system and the dispatch center, LoRa modules are used, providing long-distance data transmission with minimal power consumption.
6. Sending information to the dispatcher log. When the state of the equipment changes, the system automatically transmits information to the dispatcher's log via LoRa.

These components of the system are shown schematically in Figure 2.

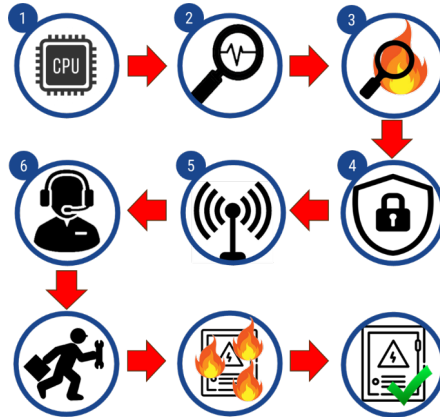


Figure 2. Scheme of system operation in case of emergency

Features of LoRa modules include the use of LoRa (Long Range) wireless communication technology, which is based on a specific signal modulation in the frequency range 864-915 MHz, depending on the region. These modules allow you to connect to the LoRaWAN network and transmit small data packets from sensors through a gateway system to the server.

A feature of the selected communication technology is the operation of LoRa modules in an unlicensed frequency range. Due to the low power consumption of LoRa technology, end devices can operate for a long time without replacing batteries, and in autonomous mode even up to 10 years. The general view of the LoRa module is shown in Figure 3.

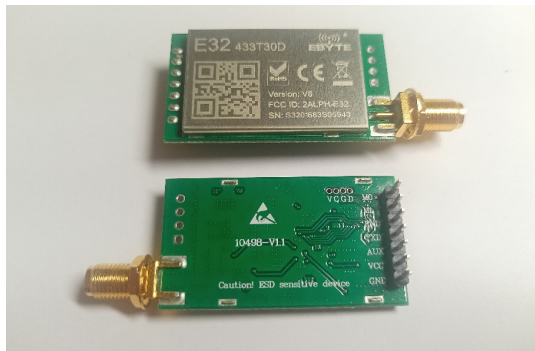


Figure 3. General view of the LoRa module

When using standard antennas, the communication distance of LoRa modules is limited to 5 km in the city and 15 km in open areas, but with the correct selection and calculation of transceiver antennas, this distance can be increased to 200 kilometers [6].

Thanks to the use of one of the most modern encryption protocols - AES-128, LoRa ensures secure data transmission. Where, thanks to built-in algorithms, using a secret key, some 128-bit blocks are converted into others. To decrypt the resulting 128-bit block, a second transformation with the same secret key is used.

Also, one of the characteristic features of LoRa modules is the ease of connection with a microcontroller [7]. Where two modules are configured as a bridge connection using the UART protocol, for a receiver and a transmitter.

The proposed monitoring system for railway floor equipment represents an innovation with high potential for practical application, which can significantly improve the safety and reliability of railway infrastructure.

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提高热轮机的效率

IMPROVING THE EFFICIENCY OF HEATING TURBINES

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注解。任何发电厂自动调节的任务都是确保其在各种工况下正常运行，例如短路、高压线路断裂、大功率机组停机等。与这些情况相关，出现了调节电网功率的问题。为了解决这个问题，使用了热涡轮机，其设计不断升级。根据文献来源的审查结果，选择了使用 SimInTech 软件包的数学建模工具进一步分析热轮机的方向。

关键词：热轮机、调节、保护、负载、热能。

Annotation. *The task of automatic regulation of any power plant is to ensure its normal operation under various operating conditions, for example, short circuit, breakage of high-voltage power lines, shutdown of a powerful power unit. In connection with these circumstances, problems arise with regulating the power of the electrical network. To solve this problem, heating turbines are used, the designs of which are constantly being upgraded. As a result of the review of literature sources, the directions for further analysis of heating turbines using mathematical modeling tools of the SimInTech package were selected.*

Keywords: *Heating turbine, regulation, protection, load, thermal energy.*

Heating turbines are widely used in the energy sector to provide consumers with electric and thermal energy. To evenly distribute the load in the energy system, turbine units with the highest developed capacity are put into operation, since under this condition there will be a maximum efficiency. It is impractical to use power plants with powerful, expensive, highly economical units to cover half-peak and peak loads. Any underutilization of such units leads to an increase in the cost of the production product. Microprocessor control and protection systems of a steam turbine include a hydromechanical part and elements of electrical feedbacks. The performance of this system is assessed by its continuous impact on

the elements of the installation. The turbine is controlled by an operator station based on an industrial personal computer. The operator station has the minimum necessary set of electromechanical controls and indications connected directly to the control cabinet in case of a computer malfunction [1].

The electrical part of the control and protection system performs a number of basic functions:

- speed control with an accuracy of at least 1 rpm, with a given unevenness (4-5%) over the entire power range, including when working on an isolated load;
- restrictive regulation of parameters, preventing their change to unacceptable values (minimum fresh steam pressure, maximum pressure in the control stage, maximum steam pressure in the heat extraction, etc.);
- anti-acceleration control: keeping the rotation speed within acceptable values with full or partial load relief (relay boost, differentiator);
 - pacing of steam distribution organs and stop valves;
- protection against unacceptable axial displacement of the rotor, high pressure in the condenser, lowering oil pressure in the lubrication system, increasing steam pressure in the heat extraction, increasing steam pressure in the production selection, increasing vibration of turbine bearings, lowering or increasing the temperature of fresh steam, failure of the electronic part of the control system (the list of protections is specified during operation);
- archiving and logging of parameters, personnel actions; removal of characteristics.

Let's consider the main factors that reduce the maneuverability of the turbine. The most dangerous are the temperature stresses in the high and medium pressure cylinder rotors in the steam inlet region, where the steam temperature and its rate of change are maximum [2].

In the area of concentrators - thermal grooves and pre-disk gaskets, cracks of low-cycle (thermal) fatigue occur during overheating. Heating of the flanges and studs reduces temperature differences in the design of the turbine unit. For this purpose, a collector is used with the possibility of separate temperature control of these parts. In addition to shut-off valves, additional fittings are needed on the steam supply and discharge lines: safety valves must be installed on the discharge lines so that in case of high pressure supply to the boxes (by mistake of the maintenance personnel or when steaming the internal sealing belt), the boxes do not rupture. Pipelines and ducts must have drains to warm up and remove condensate. Currently, a heating system without boxes is being implemented on powerful turbines, in which heating steam is supplied only in a large-sized enclosure.

For a coordinated thermal expansion of the rotor and the housing, the diameter of the rotor, the wall thickness of the housing and the width of the flanges should,

if possible, be selected so that their average temperatures vary equally over time, and the nominal values of the coolant are maintained in a timely manner by thin nozzle boxes, which reduce the temperature and steam pressure. The nozzle apparatus is used for throttle steam distribution, while losses of heated steam occur.

A feature of the operation of heating turbines is the long-distance steam distribution devices. For this reason, hydraulic and electrical connections have an advantage in contrast to lever control connections [2].

For example, in the T-125/150-12.8 turbine, a control stage chamber is not provided for nozzle steam distribution, this circumstance makes it possible to obtain in the calculations of the nominal mode a relative internal efficiency in the control compartment of up to 85% and a relative internal efficiency of the flow part of the high-pressure cylinder of 88%. The use of nozzle steam distribution assumes regular operation of the turbine in variable modes.

When the full electrical load is discharged in the installation, reverse steam flows occur from heat exchangers connected to the turbine extraction chambers, and the rotor speed also increases. There is a process of outflow of a stream of “boiling” steam and its expansion in the flow part of the turbine, formed when the pressure in the turbine drops due to water in the heater at saturation temperature. The high-potential steam contained in the high-pressure bypass pipes and the high-pressure flow part of the turbine, as well as coming through the control valves during their closure, the so-called “flyover steam” with a mass calculated by the formula, [3]:

$$m_{m} = G_m (fT_{pk} + T_{3,pk}),$$

where G_m — fresh steam consumption per turbine, kg/s;

f — valve throttling or steam distribution coefficient;

T_{pk} — closing time of the control valve, s;

$T_{3,pk}$ — the delay time before the start of closing the control valve, s.

The additional steam volume is reduced due to the traditional nozzle steam distribution with a cam switchgear operating in the normal operation of the turbine. In case of accidents, individual control valve actuators come into action, in particular, during load relief. All valves close simultaneously at maximum speed, which is accompanied by a sharp change in the velocity of the liquid, this can lead to a water hammer at high pressures.

When the turbine unit is idling, the work is performed at a nominal rotor speed with a power at the generator terminals equal to zero. The danger of this mode of operation is due to the strong heating of the output part of the turbine, the appearance of strong vibrations due to the vertical displacement of the heated housings of the built-in bearings, violation of the drive shaft line.

A way to increase the reliability of turbine protection against overlocking is to install check valves on the condensate drain (together with or instead of funnels)

between the steam space of the heater and the condensate collector. Deposits in the gaps between the rods and the control valve bushings may cause the device to fail. An additional emergency situation is possible when the coolant supply is stopped, however, the protection system will stop the turbine unit with the help of stop valves, in the system of which the servo motor creates additional force to ensure rapid operation of automation. It is necessary to carefully isolate the turbine, valves, bypass pipes, steam pipes and fittings on them. This will avoid thermal deformations of the housing during cooling and a large difference in the cooling rate of the listed elements, will facilitate the start from the hot state. The steam turbine power is regulated [4]:

- high-quality regulation, in which the power of the turbine unit is regulated by changing the initial parameters of steam (pressure and temperature) at a constant flow rate through the flow part;
- quantitative regulation, in which the power of the turbine unit is regulated by changing the flow rate of steam through the flow part without changing its initial parameters in front of the turbine;
- mixed regulation, which is a combination of qualitative and quantitative regulation.

The Ural Turbine Plant uses a connected system for regulating powerful heating turbines, which includes unified electrohydraulic systems that are applied to turbines with a single regulated steam extraction. Each system requires consideration of the individual characteristics of the object, as well as appropriate settings. A distinctive indicator of the regulation of a turbine with a nominal capacity of 250 MW and a maximum capacity of 300 MW, with an initial pressure of 240 MPa, has the presence of water for fire safety. In a multi-stage installation, regulatory and protective mechanisms become more complicated and duplicated, and the number of steam withdrawals for heating or production needs increases [5].

Conclusion: during the operation of turbines, increased attention is required to the control and protection system due to the need to maintain normal operation without losses and equipment failure. As a result of the review of literature sources, the directions for further analysis of heating turbines using mathematical modeling tools of the SimInTech package were selected.

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岩石控制台支撑压力区工作稳定性的地质力学评价
**GEOMECHANICAL ASSESSMENT OF THE STABILITY OF
WORKINGS IN THE ZONE OF SUPPORT PRESSURE OF THE
ROCK CONSOLE**

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注解。在采用分段崩落法采矿时，未塌陷岩石悬臂支撑压力影响区的开发工作稳定性是一个复杂的采矿问题。在本研究中，在 Simulia Abaqus 软件中对平面应变模式下的模型进行多元数值建模，使用自定义子程序来模拟顺序塌陷，并给出了塌陷准则。利用等效材料的物理模型，研究了当井间矿柱尺寸变化时卸油井地块应力状态的变化。提出了确保未塌陷岩石悬臂支撑区域开发工作稳定性的建议。

关键词：矿山工作稳定性、崩落采矿系统、多元数值模拟。

Annotation. *The stability of development workings in the zone of influence of the support pressure of the cantilever of uncollapsed rocks is a complex mining problem when mining with sublevel caving systems. In this study, multivariate numerical modeling was performed in Simulia Abaqus software on models in the plane strain mode using a custom subroutine to simulate sequential collapse, and a collapse criterion was given. Using physical modeling on equivalent materials, a study was carried out of the change in the stress state of the massif from unloading wells when the size of the pillars between the wells changed. Recommendations are given to ensure the stability of development workings in the area of supporting the cantilever of uncollapsed rocks.*

Keywords: *stability of mine workings, caving mining system, multivariate numerical modeling.*

Introduction. The sub-story caving development system is high-performance and low-cost. Such systems are widely used in the mining of various mineral ores around the world, including in the Russian Federation. Most often, development with sublevel caving is carried out for deposits in highly stressed massifs for inclined ore bodies. In addition, often the ores and rocks of such massifs are distinguished by high strength and high elastic characteristics. All of the above requires solving problems not only to ensure the stability of mine workings, but also protection from rock bursts.

Formulation of the problem. In this study, multivariate numerical modeling in the Simulia Abaqus software package was used to study the stress-strain state (SSS) of the massif around the workings of the development horizon. The problem was solved in the plane deformation formulation; the calculation diagram is presented in Figure 1

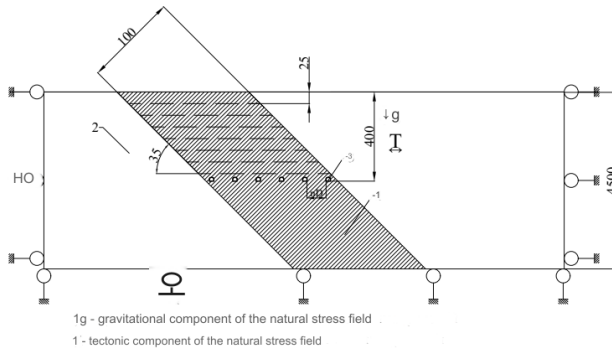


Figure 1. *Design diagram*

1 – ore body; 2 – host rock mass; 3 – preparatory workings

As can be seen from the above diagram, the problem was solved for an ore body with a slope of 35° , a thickness of 100 m. The size of the mined sublevel was 25 m. In this study, workings at a depth of 400 m from the surface were considered. The variable parameter is the reduced width of the pillar, taken in the range of $1D$, $3D$ and $5D$, where D is the width of the excavation.

The stress field is gravitational-tectonic with a significant excess of horizontal stresses over vertical ones (Table 1). The boundary conditions for the model were formed according to the standard ones for this type of problem (prohibition on movements in the direction perpendicular to the faces).

Table 1

Parameters of the natural stress field

Depth from surface, m	Vertical stresses, MPa σ_y	Stress across strike, MPa σ_x	$\frac{\sigma_x}{\sigma_y}$	Stress along strike, MPa σ_z	$\frac{\sigma_z}{\sigma_y}$
0	0.00	0.00	2.92	0.00	3.47
300	8.40	24.57	2.92	29.13	3.47
600	16.80	36.92	2.20	50.97	3.03
800	22.40	41.16	1.84	55.53	2.48
4500	84.00	97.70	1.16	116.95	1.39

To specify the model, an elastoplastic model of material behavior with the following characteristics was used (Table 2).

Table 2

Physico-mechanical properties of ore and rock massifs

Material	Specific gravity, MN/m ³	Clutch. MPa	Angle of internal friction	Poisson's ratio	Modulus of elasticity in the massif, MPa
Breed	0.028	37.05	41.08	0.23	15240
Ore	0.030	29.69	41.51	0.26	12800

A key feature of this model was the use of a collapse criterion, which was developed and implemented as a user subroutine (Abaqus Fortran Subroutine). The condition determining the onset of the moment of collapse of hanging rocks was the achievement of critical values by the main deformations. This subroutine, according to the criterion included in it, allows you to “remove” individual finite elements from the calculation scheme directly when performing the calculation (in fact, the mechanical stiffness in such finite elements is reset to zero). Thus, with sufficiently small sizes of finite elements in the geometry of the rock console, in combination with the introduction of softening into the elastoplastic model of the host rock material, it is possible to simulate the process of formation of detachment and/or shear cracks. The model used the Dynamic Explicit solver. The finite element mesh is represented by four-node elements with differentiation of sizes from larger at the edges of the model to smaller ones near the workings. The total number of elements was 210 thousand.

Results. The use of the previously described collapse criterion made it possible to form a physical and close to reality picture of the collapse of the rock console (Figure 2)

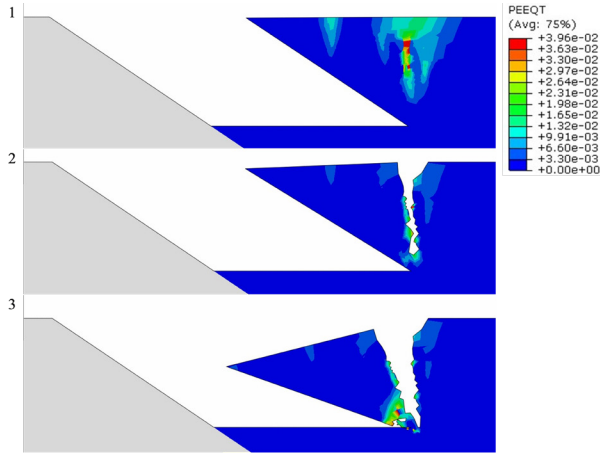


Figure 2. Stages of collapse formation according to the brittle mechanism: 1 – formation of inelastic deformations due to underworking; 2 – formation of the separation surface; 3 – console collapse

The reason for the implementation of collapse in this model was to study the influence of self-collapse of hanging rocks on the area of support pressure. Figure 3 shows the gradual change in the stress state in the support zone of the rock console during its collapse

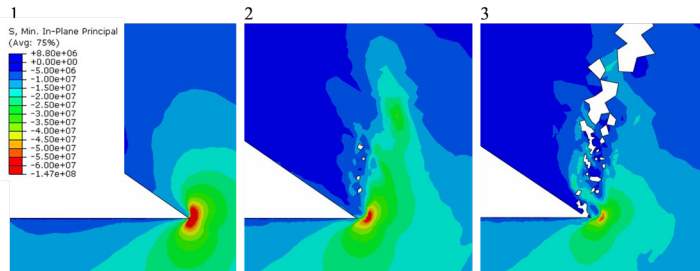


Figure 3. Isochrome distribution of the highest principal stresses in the support zone of the rock console (mining depth 300 m)

At the moment of formation of the underwork of the console (1), a concentration of the highest principal stresses (about 60 MPa) is formed at the point of support. As can be seen below, during the formation of a separation crack (2) and further self-collapse (3), the stress level in this place drops almost 2 times (to 30-35 MPa). In this case, the orientation of the vector of the largest principal stresses

also rotates, tending to the original one. Obviously, this occurs due to a decrease in the weight of the overlying rock mass, the influence of the cantilever hanging decreases, and the stress distribution again acquires a gravity-tectonic character with a significant horizontal component.

Let us consider the state of stress in the pillars of the preparatory horizon. Figure 4 shows a systematic change in the stress state during self-collapse of hanging rocks at different pillar widths. The stress concentration zone expectedly decreases during the formation of a collapse for any width of the pillar. However, the smaller the width of the pillar, the more insignificantly the level of stress in the support pressure zone decreases. Thus, with a pillar width equal to 5 mine spans, the concentration zone is significantly smaller before the collapse begins, and after it is almost completely compensated. We can also conclude that the level of stress directly in the pillars will also be significantly lower.

The highest level of stress occurs in the right side of the excavation, located directly under the support of the console, and some increase can be seen in the left side at the heel of the arch. This is especially pronounced with a pillar width of 5D, which is the closest to the real development system in such fields. It can be concluded that it is in these places that manifestations of rock pressure, such as peeling and stagnation, will be observed. This corresponds to real situations in mines using a sublevel mining system.

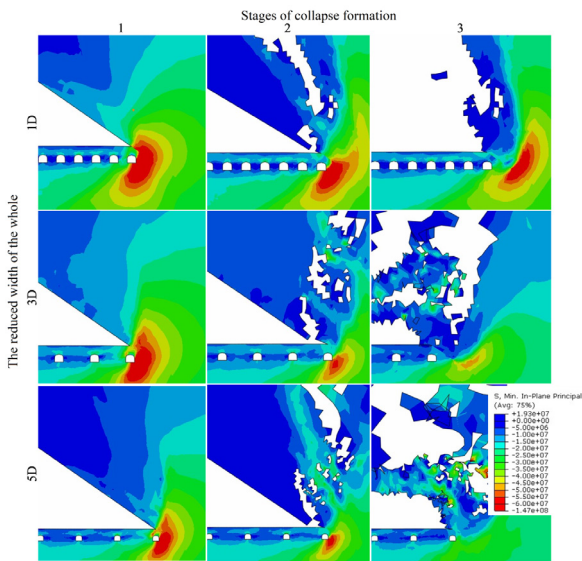


Figure 4. Isochromes of the distribution of the highest principal stresses in the support zone of the rock console at a mining depth of 400 m

Despite the unloading due to self-collapse, the stress level is still quite high, so it is necessary to take measures to control rock pressure. One of the effective ways to reduce stress is to unload the rock mass using deep parallel wells. Due to the destruction of pillars between the wells, a zone of softened rocks is formed, which is not capable of accumulating elastic energy, the zone of stress concentration shifts to the ends of the wells, and part of the massif in the zone of action of the wells falls into the unloading area. Due to the long length of the wells, it becomes possible to reduce stress over large areas and in a large volume of rocks, including several workings at once.

Using physical models made of equivalent materials, studies of the influence of unloading wells on the stressed state of the massif were carried out. The model simulated the drilling of relief wells with a diameter of 102 mm from a working, located near the contact of the ore zone with the rocks of the hanging wall of the deposit, directly below the edge of the goaf (under the boundary of the collapse zone). The change in stress state at various points of the model was measured using stress sensors.

The experiment was carried out simulating varying degrees of destruction of pillars between wells: at the first stage of drilling - the deformation of pillars was 30%; at the 2nd stage of drilling – 60%. The degree of deformation of pillars between wells depends on the distance between wells and should be determined for the conditions of each deposit, taking into account the properties of rocks, their structural disturbance and characteristics of the stress state.

Studies have shown that the magnitude of the stress reduction from the initial one (before drilling wells) with low well deformation is 10%-38% at a distance of up to 50-60 m from the well plane; with large deformation of wells, the stress reduction is 10%-52% at a distance of up to 90 m from the well plane (Figure 5).

As follows from the data obtained, the greatest reduction in stresses is observed in the zone of concentration of maximum stresses under the corner part of the collapsed rocks - it is in these places that the workings experience the worst operating conditions.

Under experimental conditions, the use of massif unloading by drilling deep parallel wells makes it possible to create favorable geomechanical conditions for drilling up to three workings at the drilling horizon, as well as at the next underlying horizon. Conducting mining operations in such conditions will not require the cost of applying shockproof measures, and will also significantly reduce the cost of securing the workings.

Research results show high efficiency from drilling deep relief wells. General conclusions confirmed that the dimensions of the unloading area depend on the dimensions (total length) of the plane of the unloading wells, and the amount of unloading depends on the degree of deformation of the pillars between the wells.

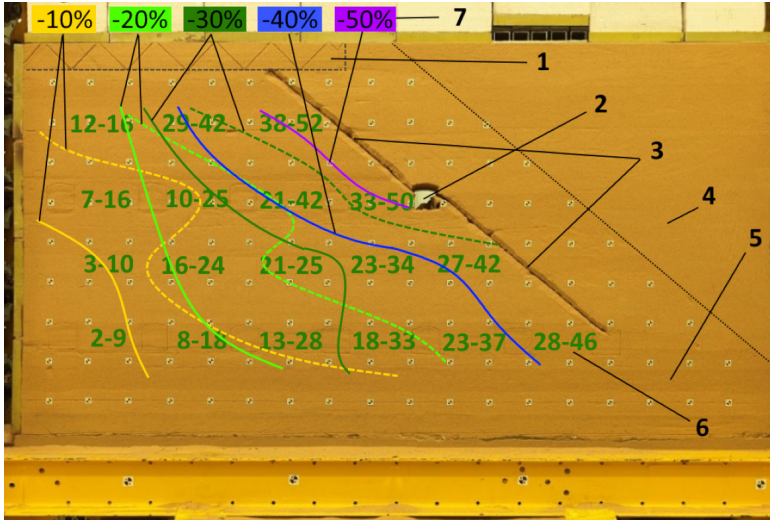


Figure 5. Experiment scheme. 1 – Zone of collapsed rocks; 2 – mine opening for drilling; 3 – unloading wells; 4 – hanging wall rocks; 5 – ore body; 6 – values of relative stress reduction (%) from the initial one: “after the 1st stage of drilling” – “after the 2nd stage of drilling”; 7 – isolines of relative stress reduction (%) from the initial one: broken line - after the 1st stage of drilling, solid line - after the 2nd stage of drilling.

Conclusion. In the course of this study, the stress-strain state of the massif in the support zone of the cantilever of uncollapsed rocks, its change during self-collapse of the cantilever and when using unloading wells with different parameters were investigated. It was revealed that the use of an elastic-plastic model of material behavior together with the collapse criterion shows results that correspond to the real situation in fields developed by development systems with sublevel collapse. A promising direction for continuing this research is to add diversity to such factors as the thickness and angle of inclination of the ore body, as well as the depth of work. It is shown that the magnitude of stress reduction is significantly influenced by the distance between relief wells; therefore, determining the most effective parameters for drilling wells is an urgent task for the development of each rock-prone deposit.

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乌兹别克斯坦兔养殖现状及发展前景

CURRENT STATE AND DEVELOPMENT PROSPECTS OF RABBIT BREEDING IN UZBEKISTAN

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注解。 文章对近年来乌兹别克斯坦共和国畜禽养殖、兔养殖状况及发展存在的主要问题进行了总体评价。 特别关注兔子养殖在粮食安全中的作用、兔子的数量和兔子饲养者的结构。 对2015–2023年期间乌兹别克斯坦各地区畜牧业和兔子养殖业的发展进行了评估。 对乌兹别克斯坦炎热气候下的食物供应和饲养兔子技术进行了评估。 兔子育种和遗传学中心报告了两个创新项目：“创造肉兔杂交后代”和“乌兹别克斯坦加速兔子育种技术的创造”。 乌兹别克斯坦兔子养殖作为肉类畜牧业的一个分支以及作为人口所需的最有价值的膳食肉类来源的前景得到证实。 给出了科技进步的因素和养兔发展中一系列复杂问题的系统运用。 由于每年人口增长高达730–75万人，并且需要为人口提供畜产品，因此兔子养殖的发展因其生物学特性、现有的繁殖和饲养方法、伊斯兰许可而前景广阔。 适合原产地消费、早熟和高生产率。 作者得出的结论是，通过正确组织技术工作，兔子的数量可以增加六倍。

关键词：畜牧业、牛、绵羊和山羊、家禽、兔子、生产力、饮食、饲养、生物学特性、前景。

Annotation. *The article evaluates a general overview of the state of livestock and poultry farming, rabbit breeding in the Republic of Uzbekistan in recent years and the main problems of their development. Particular attention is paid to characterizing the role of rabbit farming in food security, the number of rabbits and the structure of rabbit holders. An assessment is made of the development of livestock and rabbit breeding in Uzbekistan by region for the period 2015-2023. The food supply and technologies for raising rabbits in the hot climate of Uzbekistan were assessed. Two innovative projects were reported: “Creation*

of hybrid generations of broiler rabbits” and “Creation of technologies for accelerated rabbit breeding in Uzbekistan” by the center for breeding and genetics of rabbit breeding. The prospects of rabbit breeding in Uzbekistan as a branch of meat husbandry and as the most valuable source of dietary meat necessary for the population are substantiated. The factors of scientific and technological progress and the systematic use of a complex of issues in the development of rabbit breeding are given. Due to the high annual population growth of up to 730-750 thousand people per year and the need to provide the population with livestock products, the development of rabbit breeding is promising due to its biological characteristics, existing methods of breeding and rearing, Islamic permission for consumption by origin and early maturity and high productivity. The authors concluded that with the correct organization of technological work, it is possible to increase the number of rabbits by six times.

Keywords: *livestock farming, cattle, sheep and goats, poultry, rabbits, productivity, diet, feeding, biological characteristics, prospects.*

Introduction. According to forecasts by the UN International Food Organization (FAO), in the coming years, rabbit meat will occupy a significant place in the human diet, which is only possible with a sharp increase in the number of these animals. To ensure people’s diets with food and food security for any country in the world, the importance of the stable development of livestock and poultry farming and rabbit breeding can hardly be overestimated [2,3,6].

Livestock farming is one of the popular sectors of agriculture in any country, including Uzbekistan. For Uzbekistan, livestock farming is one of the leading areas of the agricultural industry. On the one hand, it satisfies part of the population’s needs for valuable livestock and poultry products - ensuring food security, on the other hand, it provides employment for the working-age part of the country’s population. Currently, Uzbekistan’s livestock and poultry products, such as karakul skins, commercial and hatching eggs, and poultry meat, have begun to be exported to the markets of neighboring countries.

Rabbit breeding in Uzbekistan can become a promising branch of meat husbandry as the most valuable source of dietary meat needed as poultry farming. The course of history gradually confirms the slogan proclaimed more than 40 years ago at the World Congress of Rabbit Breeders (Rome, 1984): “Rabbit is the future food of humanity” [3,6,7].

All industry experts in their practice increasingly recognize that the main direction of increasing the production of rabbit breeding products is the use of products of all scientific and technological progress and the systematic use of a complex of many factors..

The list of these factors includes:

- targeted selection and breeding work with rabbits of different areas of productivity,
- use and implementation of experience in advanced techniques for keeping and managing rabbits of different physiological groups and product lines,
- the use of optimal feeding standards that contribute to their manifestation of the genetic potential of productivity, taking into account the nutritional value of available feed and feed additives in accordance with their age, live weight, productivity and physiological state.

The purpose and objectives of the research are to analyze the state and development paths, as well as forecast the future of rabbit breeding in different farms in order to determine the paths of scientific development of the industry in the Republic of Uzbekistan.

In accordance with the purpose of this study, the following tasks were set:

- determine and study the general state of rabbit breeding in the republic over the past 12-10 years;
- assess productivity and characterize the feed supply of rabbit breeding;
- develop general recommendations for the successful development of rabbit breeding in the republic.

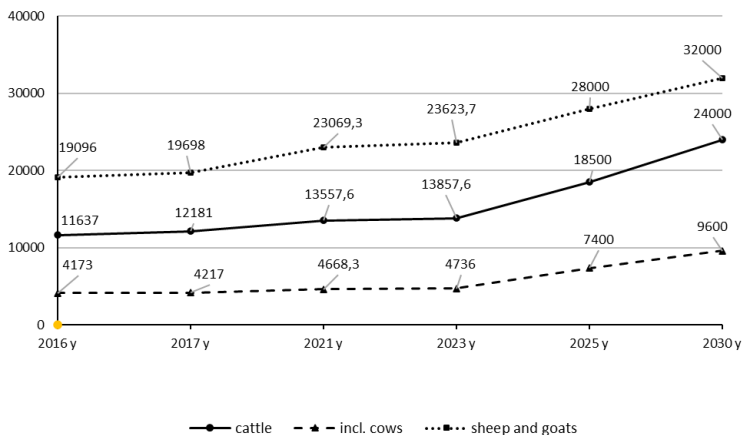
Objects and methods of research. The object of these studies was data on the state of development of rabbit breeding in the Republic of Uzbekistan and the development of recommendations for increasing rabbit breeding products. The studies used data analysis and comparison methods. forecasting.

Relevance of the topic. Currently, the population growth rate in Uzbekistan is more than 2000 people per day or about 730 thousand per year. According to demographic forecasts, by 2041 it will reach more than 50 million people [2,6]. With such population development, the growth in food consumption, in particular livestock and poultry farming, can be predicted to be around 40%. The current situation requires a radical revision of the production of livestock products, including rabbit breeding. In this regard, the use of new technologies to increase rabbit production is relevant.

Research results and analysis. Until 2017, rabbit breeding was a kind of hobby for people who own small farms. Before this, the republic did not have the necessary information, scientific literature, specialists and rabbit breeding enterprises themselves. Today no one doubts the nutritional value of rabbit meat. And its attractiveness in Uzbekistan increased after the government created a unified management center for livestock farming and veterinary medicine in the country - the Committee for the Development of Veterinary Medicine and Livestock Husbandry. The steps taken by the republic's leadership to ensure the country's food security have had a positive impact on the development of livestock and poultry

farming, including rabbit breeding [4,5]. Let's turn to official static data for the last 12 years (Fig. 1 and Presentation No. 1).

Today, a total of 18,032 livestock farms operate in the republic, including 7,614 created in the field of cattle breeding, sheep and goat breeding - 3,263, horse breeding - 142, camel farming - 52, poultry farming - 1,163, fish farming - 4,829, beekeeping - 715, rabbit farming - 254 farms [2]. The development of livestock and poultry farming in Uzbekistan is important, therefore, over the past decade, the government of the country has made more than 10 fundamental decisions to remove barriers to their path in order to make these areas of the national economy as economically profitable as possible, and their development sustainable. The decision to develop livestock farming yielded positive results (Fig. 1).



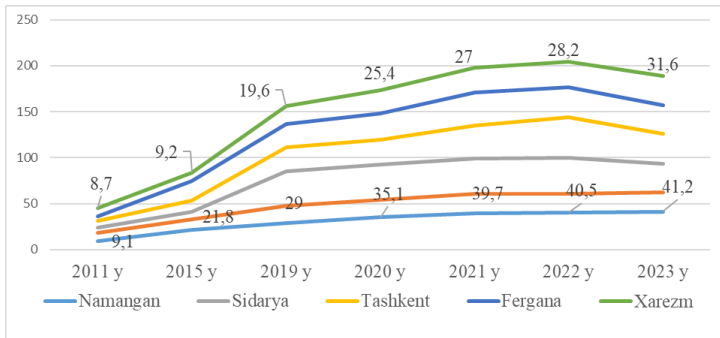
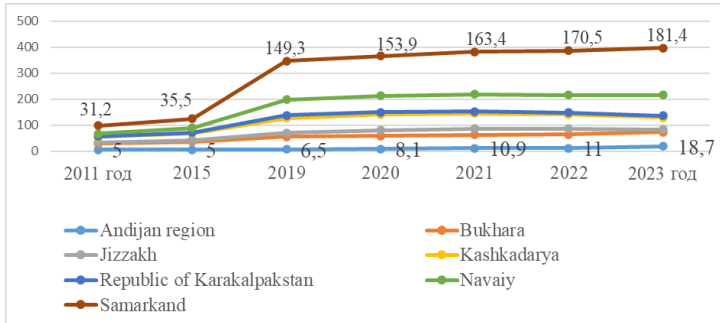
Rice. 1. Dynamics of growth of cattle and small cattle livestock for 2016-2023. and development forecast by 2030, thousands of heads.

By January 1, 2023, in the Republic of Uzbekistan there were more than 13857.6 thousand heads of cattle, including cows - 4736 thousand heads, total small cattle - 23623.7 thousand heads, poultry - about 97310 thousand heads . The total meat produced was 2725.9 thousand tons, milk – 11629.4 thousand tons, eggs – 8129.2 million pieces [2].

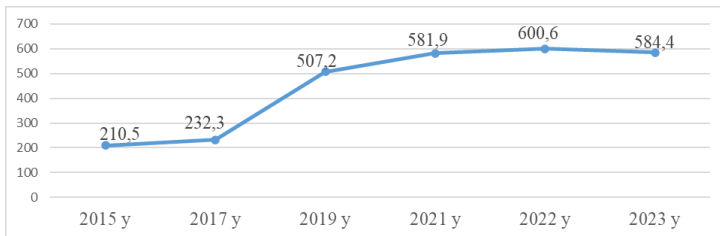
If you look at the static data on rabbit breeding, you can only see their total population as of January of the year in the context of each region and republic, as well as by farm ownership (presentation No. 1 and Figure 2).

Presentation No. 1

*Total number of rabbits in Uzbekistan for 2011 -2023
(data from the state statistics agency)*



If we analyze the growth rate of development of livestock industries, we can see that the number of rabbits in the period from 2015 to 2023 increased by 2.77 times (Figure 2). The decrease in the number of animals in 2023 by 25.6 thousand heads is associated with abnormal cold weather in the republic.

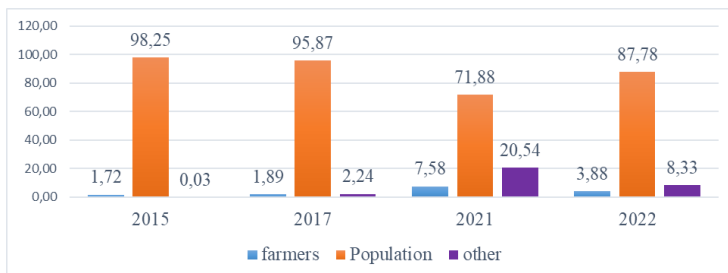


Rice. 2. Dynamics of the total rabbit population by year

Over the years, the structure of rabbit population holders has also changed. So, if in 2015 the main holders of 98.28% of rabbits were dehkan farms, then by 2021 their share fell to 71.88%. Farmers and other specialized farms for raising rabbits have appeared in the republic (presentation 2).

Presentation No. 2

Dynamics of changes in the shares of farms in rabbit breeding, %



Discussion of the results obtained. Despite the available statistics, it is quite difficult to obtain objective data on production volumes, since rabbits are often kept on personal farmsteads for their own consumption and their products, as in many CIS countries, are not officially registered anywhere.

Due to their precociousness and high intensity of reproduction, rabbits can produce 70-120 kg per year, depending on the growing technology, dietary meat, especially necessary for older people and children. Rabbit meat is easily digested by the body. As a valuable dietary product that does not cause allergic reactions, it is recommended for children, the elderly, as well as those who suffer from diseases of the stomach, liver and cardiovascular system.

For everyone involved in rabbit breeding in Uzbekistan, the government of the country has removed all bureaucratic barriers. What is important is the fact that in the first stages the main attention was and is being paid not only to feeding, but also to improving all the components of the technologies: premises, equipment, sanitary conditions. The main goal in this case is to obtain more marketable products per main rabbit.

It is important to note that adequate breeding, the creation of specialized lines and breeding programs are organized in developed countries. An industry information system is being formed that provides promotion and advertising of products, as well as marketing of everything related to the successful operation of the industry. And the more perfect the system is, the greater its focus on the quality of the final product, taking into account the evolution of consumer requirements.

This development experience was adopted in Uzbekistan. Thus, in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan

dated August 2, 2019, No. 647 “On measures to further improve scientific activities in the republic in the field of rabbit breeding,” our “center for selection and genetics of rabbit breeding” was created at the Research Institute of Livestock and Poultry Farming.

The center has 4 departments with a total of 16 employees on staff. Since its establishment, the center has been implementing 2 innovative projects: “Creation of hybrid generations of broiler rabbits” and “Creation of technologies for accelerated rabbit breeding in Uzbekistan.” As part of the project, experiments are being carried out with local and imported breeds of rabbits such as Californian, Flanders, etc. To educate rabbit lovers among the population, monographs in Uzbek on rabbit breeding and more than 50 articles have been published. In 2024, 2 graduate students began training.

Currently, it is very difficult to determine the place of rabbit breeding in our country in the production of livestock products, due to the difficulty of objectively assessing the results of activities. Currently, the state of rabbit breeding in the republic can be characterized as consumer, i.e., aimed at satisfying the personal needs of a certain part of the population for food, and not commercial, which can be observed in some countries of the world.

Considering the current state of domestic rabbit breeding, it should be noted that the main reasons for the low level of development of rabbit breeding in the private sector are:

- difficulties in obtaining a plot of land and a long-term soft loan for the construction of a rabbit farm;
- purchase of breeding stock and feed;
- difficulties with organizing feeding of rabbits of different ages and physiological conditions;
 - the presence of local specialized granulated feed for rabbits and the high price of imported feed;
 - shortage and absence of breeding stock of rabbits in most regions of the country.

An aggravating risk factor is the negligible number of farms engaged in purebred rabbit breeding and keeping breeding records in accordance with current zootechnical standards. All this comes into conflict with the needs of the industry in the republic.

Based on the above, the following conclusion was made:

1. Given the current situation in modern conditions, we consider it advisable to direct the efforts of scientists and production workers in Russia and Uzbekistan to the development of resource-saving technologies for the environmentally friendly production of meat and rabbit skins, when feeding them according to rations using new recipes for protein-vitamin-mineral supplements, cheap, non-traditional feeds and various biologically active substances.

2. Rabbit farming has great potential for development in Uzbekistan. Thanks to this industry, it is possible not only to improve the nutritional structure of the population of the republic, but also to help in solving other socio-economic issues, in particular – employment of the population.

3. The prospects for rabbit farming in Uzbekistan, where there is a high annual population growth of up to 730-750 people and a shortage of livestock products, are promising due to its biological characteristics, existing methods of breeding and rearing, Islamic permission for consumption by origin and early ripening and high productivity .

4. With proper organization of work in rabbit breeding, using the example of the Samarkand region, the number of rabbits can be increased sixfold.

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建筑业线性经济体系的危机。向基于闭环经济的可持续原则过渡。以钢铁限制为例，俄罗斯建筑中应用可持续方法的可能性

CRISIS OF THE LINEAR ECONOMIC SYSTEM IN THE CONSTRUCTION SECTOR. TRANSITION TO SUSTAINABLE PRINCIPLES BASED ON CLOSED CYCLE ECONOMY. POSSIBILITIES OF APPLICATION OF SUSTAINABLE METHODS IN CONSTRUCTION FOR RUSSIA ON THE EXAMPLE OF STEEL RESTRICTIONS

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注解。本文探讨了通过循环经济方法向可持续建筑转型作为全球趋势的主要规定。作出这一决定的先决条件是什么？以前的线性经济体系的缺点及其在现代生产率下的低效率，以及当今建筑市场必须应对的环境和经济后果。还讨论了俄罗斯可持续建筑的趋势：回收金属结构的前景。

关键词：循环经济、线性经济系统、生命周期、资源效率、循环利用、低碳经济。

Annotation. This paper examines the main provisions of the transition to sustainable construction as a global trend through circular economy methods. What were the prerequisites for such a decision, the shortcomings of the previous linear economic system and its inefficiency at modern production rates, its environmental and economic consequences that the construction market must cope with today. Trends in sustainable construction in Russia were also discussed: prospects for recycling metal structures.

Keywords: circular economy, linear economic system, life cycle, resource efficiency, recycling, low-carbon economy.

The linear economic system is today the dominant paradigm of the world economy. By involving primary resources in the production of each new product, this system is responsible for global climate change and the depletion of natural biodiversity. The concept of a linear economy is based on the unidirectional movement of resources “take-make-waste” (create – use – dispose [1]), from “raw materials” to “waste”. The lack of inclusion of waste from industrial activities has led to the formation of millions of landfills of construction and other waste around the world.

It is also worth noting that in a linear economy there are only three real waste management options: recycling; extracting the energy value of materials by burning them; burial in special landfills. To date, the presented methods are the least economically and environmentally sound, but remain relevant in the traditional linear waste management system. Thus, the potential for involving waste in a new circulation is not taken into account; materials are burned into cheaper energy resources, losing their value many times over.

The prospects are that the volume of production of the necessary primary materials will increase by 2.6 times, subject to “linear tactics” by 2060 (compared to 2011) at the same growth rate of the construction industry [2]. Already, the world economy generates about 11 billion tons of construction and demolition waste, which is about 30% of the total volume of waste produced [3].

The crisis of the linear model in construction is primarily due to several key factors:

1) Rising prices for extracted resources. According to research from the Ellen MacArthur Foundation, commodity prices reached an inflection point in 1999 and have gained unsustainable upward momentum since then [4]. At the same time, rapid urbanization and population growth is increasing the demand for new buildings, exacerbating the strain on resources. According to Rosstat, the high cost of building materials is the most important limiting factor for construction organizations in Russia [5]. Thus, as resources become more in demand and more expensive, the linear model becomes less and less economically viable.

2) Volume of waste generated. The construction industry accounts for up to half of the world’s natural resources, and produces approximately a third of waste [4]. This is due to the fact that, with a linear approach, sustainable projects for the management of building materials at the end of the life cycle of buildings are not developed, since it is obvious for this system that they will be disposed of or buried (70-80% of construction waste is annually buried in landfills around the world [6]). However, given that more than 75% of waste from the construction industry has reuse value [5], there is inefficiency in waste management and underestimation of the potential for its involvement.

3) Volume of resource consumption. The industry absorbs many resources, and the efficiency of their use in the linear economic paradigm remains low. The construction industry consumes about 40-50% of all extracted world resources [2] (3 billion tons, in particular about 50% of steel [7]), while at the same time the efficiency of their use is extremely low, even taking into account the fact that about 15% building materials become waste during the construction process [4]. About 36% of electricity is used by the construction industry relative to global consumption [8].

4) Impact on the environment. Unregulated extraction of materials, their production and transportation, operation of buildings, and huge amounts of waste

during construction and demolition lead to a number of climate disasters. The construction industry is responsible for at least a quarter of systemic changes on Earth [3]. Approximately 40% of global greenhouse gas emissions come from construction activities (the construction, operation and demolition of buildings combined). Cement production alone is responsible for 7% of global CO₂ emissions [9]

SWOT analysis of linear economics in construction:

Strengths:

- Well-functioning system of design, construction and operation of buildings
- Traditional linear processes and practices
- Cost effective in the short term

Weak sides:

- Relies heavily on limited resources and non-renewable materials
- A significant amount of waste that does not have economically beneficial management and use
- Does not prioritize long-term economic and environmental viability
- May be inefficient and wasteful in terms of use of materials and energy

Possibilities:

- Possibility of introducing new technologies to regulate production waste: their processing and reuse
- Potential for cost savings through better use of resources

Threats:

- Rising costs of traditional building materials and resources
- Regulatory pressures that may subsequently influence the adoption of more sustainable practices
- Increased competition from companies and projects with higher sustainability scores
- Risk of reputational deterioration as a result of failure to address environmental issues

Despite the obvious shortcomings of the linear economic system, much of the world continues to exist in a paradigm where increased resource demand is met only by increased production, while an actively developing circular economy system already offers a number of key tools in response to the growing demand for raw materials.

A circular economy is defined as a system in which resources are used for as long as possible and the maximum value is extracted from them. Conceptually, the model is rooted in industrial ecology, emphasizing the benefits of recycling waste and by-products, developing techniques to continuously maintain the circulation of resources within systems [10]. This approach accordingly reduces the need for primary materials for economic activity

The basis of the circular economy method is to maximize the recycling capacity of resources, that is, the production of goods with a pre-designed method of their recycling. The circular economy model shifts the focus from low-cost production and disposal to durable goods that can be regenerated many times before being recycled into raw materials for new products.

Benefits of moving to a circular economy:

1. Due to more efficient management of material resources, the transition to a cyclical economy can ensure global GDP growth [11]
2. Increase in jobs. The Industrial Analytics Platform projects that 18 million green jobs will be created by 2030.
3. Business continuity and self-sufficiency. The material cycle provides a solution to the ever-increasing prices of primary resources
4. Stimulating innovation and developing new technologies, as the vector is aimed at constantly searching for new, more environmentally friendly and economically sound ways to manage resources.

The transition to CCE from the construction sector is currently the most anticipated, given the fact that almost a third of total resource consumption is occupied by the construction industry, producing almost the same percentage of non-recyclable waste [12]

Circular economy in the construction industry in Russia

Over the years in Russia, with the growth of construction, there is a significant increase in the volume of waste generation and a relatively low level of waste disposal. At the same time, the number of unauthorized landfills is growing, where construction waste is the dominant morphology (there are more than 15 thousand of them in the Russian Federation) [13]

In connection with the construction of new facilities, renovation programs, and demolition of dilapidated housing in Russian cities, the generation of construction and demolition waste will tend to increase [13]. More than 1 billion m² of residential real estate is planned for commissioning by 2030 [14]. At the same time, more than 9 million m² of emergency housing stock will be eliminated as part of the “Elimination of Emergency Housing” program. It has also been recorded that the volume of construction and demolition waste increases by 1% every year [13]

Adopting a circular economy in the construction industry can multiply the efficiency of resource use, minimizing waste and promoting sustainable principles.

Recycling of metal structures

Metallurgy in Russia has a long history and remains a key sector in the country’s economy. It covers a wide range of industries, including the production of ferrous and non-ferrous metals, as well as rolling and fabrication of metal products. However, the mining of metal ores causes serious damage to the environment. The main consequences of metallurgical production activities are associated with pollution of air, soil, river water and groundwater with heavy metals.

Environmental impacts associated with metal ore mining:

1. Near 7% of global CO₂ emissions come from the iron and steel industry, mainly due to the production of ore rather than processed raw materials [15]
2. Hazardous chemical compounds and substances increase the complexity of the waste treatment process, requiring additional financial investments and the use of modern technologies. The presence of heavy metals in waste can cause the formation of acidic and alkaline effluents.
3. The extraction of metal ores, as well as the maintenance of tailings ponds, are associated with risks of accidents
4. Formation of dangerous zones in the country

The growth in demand for metals does not correspond to the pace of production:

With a multiple increase in urbanization by 2050, the modern economy, with the same approach in metallurgy, will not be able to meet the demand for many metals, including aluminum [16]

Metal recycling can become a fundamental approach in the transition to a circular economy in the construction industry. Durability and versatility, as well as the ability of many metals to be recycled many times without loss of strength properties, can ensure an effective transition to a new business model and CCE as the main economic direction until 2050 [17].

What scrap recycling projects already exist in Russia?

The key area of implementation of CCE principles is the processing of scrap, dust and slag.

1. Vtorion [18]. In 2022, the digital marketplace for recyclable materials Vtorion was launched. Its catalog includes scrap ferrous metals, and in the future it is planned to include scrap non-ferrous metals and other materials
2. Smart Waste [19] an online platform that, among other things, allows companies to find trusted contractors for transporting and processing scrap metals and a wide range of metallurgical waste.

The metallurgical complex has a significant impact on the environmental situation of the country. From the examples considered, it follows that there is a problem with the management of production waste, and the potential for recycling metal structures is not used as effectively as it could be. Bringing metal structures back into production and recycling them into new products will provide a comprehensive approach to developing sustainable economic practices in the construction industry.

What directions are possible for the implementation of circular solutions for metal building structures?

Integrating reuse into the economy opens up a number of new opportunities for builders and steel fabricators. In our current business model, buildings are

typically constructed using predominantly new steel beams because the manufacturers guarantee their quality and strength. In examples of business models from countries where recycling is well established, companies offer a range of services and offerings that increase demand for recycled materials: testing, re-certification, life-cycle safety assurance and end-of-life reuse operation of a building or structure, and, as the main advantage, cheaper building material. This provides builders with a guarantee of safety, building owners with inexpensive solutions for quick renovations, and steel structures manufacturers with a source of income.

Metal facade concept. Aluminum structures

Example of an existing business model. VMRG, Netherlands. “Rent” of facades.

In total, more than 95% of all construction aluminum is recycled in the Netherlands, and this percentage continues to grow. Melting at end-of-life requires only 5% of the energy required to produce aluminum from bauxite. Making steel from scrap uses 45% less energy than making steel from iron ore. Metal facades have a long service life, require virtually no maintenance costs, and since aluminum can be recycled endlessly without loss of quality, the material retains its value.

At the beginning of 2018, VMRG, together with Houthoff Advocaten, proposed a completely new model for the production of facades based on the circular economy [20]. Structures with the right to rent - a model that was previously legally impossible, now allows developers to buy metal structures at much lower prices, and manufacturers reserve the right to withdraw them at the end of the building’s service life. On average, the service life of metal facades is from 30 to 50 years.

The basis of this model is that after the delivery of metal structures, the manufacturer does not disappear, but, on the contrary, bears responsibility throughout the entire service life. This helps to increase confidence among consumers, as well as create a completely new market of services for the construction industry.

To track deliveries, a special platform was developed on which you can monitor the condition of structures during operation, as well as calculate the cost of structures after its expiration. The database also contains information about the composition of the alloy in these structures, which helps to navigate the composition of the alloy and the prospects for its use.

VMRG has taken the initiative to achieve a circular facade economy together with other façade sectors: VKG (plastic) and NBvT (wood), VHS (hinges and locks) and VRN (glass). Reuse of façade products and raw materials is maximized and loss of value is minimized.

Conclusion:

The construction industry has a significant impact on the environment; linear economies only exacerbate this impact by encouraging resource-intensive and

wasteful practices. Over time, this can lead to increased regulatory and compliance costs. Linear approaches to construction stifle innovation and the development of new sustainable practices, preventing the adoption of more efficient and cost-effective technologies. Overall, the economic implications of a linear strategy in the construction industry highlight the need to move towards more sustainable (circular) approaches that prioritize long-term economic, environmental and social benefits.

In a circular economy, it is possible to produce more with less, use more environmentally friendly production methods, and use what is produced for much longer. The economy creates space for the development of technology, business initiatives and new jobs.

The construction market today is faced with the need to adapt to the challenges of sustainable development, which is pushing it to introduce innovative technologies and methods. In the context of the Russian construction market, the issues of introducing sustainable practices and technologies supported by Federal projects are especially relevant. By analyzing the advantages and disadvantages of such projects, as well as the prospects for metal recycling, it can be concluded that sustainable construction is not only an environmental necessity, but also an economic benefit for the industry in the long term.

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