



# 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

Proceedings of the  
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这些会议文集结合了会议的材料 – 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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区域环境管理组织  
**ORGANIZATION OF ENVIRONMENTAL MANAGEMENT IN THE  
REGION**

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所研究问题的相关性是由于环境管理问题，因为世界各国的社会经济发展已经走上了全球生态灾难加速运动的轨迹。对这一问题的概念观点的分析表明，从传统的发展模式向新的可持续发展模式的转变，这似乎是国际社会为进一步发展和生存而努力的自然反应。本文的目的是在社会经济和环境决策相互作用的框架内实施俄罗斯和地区经济综合体的可持续发展国家战略，以确保当代和后代的利益。

关键词：区域，区域发展，生态，环境管理

**Abstract.** *The relevance of the problem under study is due to the issues of environmental management, since the socio-economic development of the countries of the world has taken the trajectory of the accelerated movement of the global eco-catastrophe. Analysis of conceptual views on this issue indicates on the transition from the traditional model of development to a new one, called the model of sustainable development, which seems to be a natural reaction of the world community, striving for its further development and survival. The purpose of the article is aimed at implementing the national strategy for the sustainable development of Russia and the economic complexes of the regions within the framework of the interaction of socio-economic and environmental decisions in order to ensure the interests of present and future generations.*

**Keywords:** *region, regional development, ecology, environmental management*

Under current conditions, a twofold situation arises. On the one hand, the development of industrialization and the introduction of high-tech industries increases the economic level of the country, on the other hand, the load on the environment increases.

In this regard, environmental protection becomes relevant along with socio-economic policy.

The solution of emerging problems when the government authorities influence the object of management is possible using the methods of environmental

management.

Environmental management is an activity carried out by central state bodies and local self-government bodies, economic objects, aimed at the implementation and observance of the current environmental legislation, based on a program-targeted approach.

There are 22 operating networks of stations of the global monitoring system in the world, as well as international and national monitoring systems [1].

One of the main ideas of monitoring is reaching a fundamentally new level of competence when making decisions on a local, regional and global scale.

The environmental monitoring system includes monitoring the state of the elements of the biosphere and monitoring the sources and factors of anthropogenic impact.

Ecological monitoring of the environment can be developed at the level of an industrial facility, city, district, region, country.

Eco-audit makes it possible to choose the best option for environmental structures, to organize information and analytical control over the state and degree of operation of environmental protection equipment, and to give an economic assessment of the planned technical and technological improvements.

A number of authors include in environmental marketing the formation of financial structures to support environmental actions, environmental auditing, environmental insurance of companies' actions, changes in manufacturers' reporting forms, new forms of advertising, the formation of new principles of trade (for example, the sale of environmentally friendly products).

Usually, the concept of environmental marketing means that a company promoting its products or services causes minimal harm to nature during the production, sale and further disposal of the product. The latter implies its final placement in the original or processed form in the environment [2].

Thus, environmental marketing at an enterprise means that the extraction of natural resources, further stages of the production of goods, delivery to the consumer, use of the goods and disposal of waste are absolutely safe for the biosphere.

The economic mechanism for ensuring the sustainability of the ecological subsystem of the region should become part of the mechanism for managing the region by local self-government bodies.

To improve the mechanism, it is necessary:

- to improve methods of economic assessment of natural resources and to bring gradually payment rates closer to the values of economic assessments;
- to substantiate the dynamics and mechanism of increasing the level of payments for natural resources and, at the same time, the implementation of tax reform, increasing the share of resource payments in the structure of taxes collected as a whole;
- to expand the range of resources used on a paid basis;

- to improve the system of ecological funds, as well as funds for the protection and reproduction of natural resources; to develop environmental banks, preferential environmental lending;
- to stimulate domestic and foreign investors for the use of man-made waste;
- to support programs and projects that reduce consumption and stimulate the reproduction of natural resources.

The new economic mechanism of environmental management should stimulate the introduction of waste-free, environmentally friendly technologies, create an interest in carrying out nature restoration and environmental protection measures, and regulate the process of locating new industrial facilities in conditions of solid environmental restrictions [3].

Russia's transition to new economic relations in the field of environmental protection should be accompanied by:

- the introduction of market relations in environmental protection for the right for pollution with waste from the production process;
- the use of the right to influence the assimilation potential of the territory, creation and implementation of waste-free and resource-saving technologies;
- protection and enhancement of the existing level of biodiversity and creation of a legal and regulatory framework governing relations in the field of environmental management.

In foreign practice, the principle of "preventive environmental protection or prevention of negative anthropogenic impact on the natural environment" was supported.

Environmental impact assessment is a preventive environmental control tool over the economic activities of entities.

In addition to assessing the impact on the environment, the state environmental expertise is applied in Russia.

The centralization of environmental control is due to the scientific substantiation of the norms of the volumes of emission of emitted harmful substances, the background state of the environment, the establishment of special conditions for the use of natural resources [4].

The regulation of the volumes of pollutants is carried out with maximum consideration of the consequences of harmful effects on the health of the population and the state of the environment, as well as on the socio-economic consequences in the activities of an economic entity and the region.

On the basis of the conclusions of the state environmental expertise, enterprises receive annually permits for environmental pollution.

It is necessary to conduct a public ecological expertise, which in the new market conditions should become an effective mechanism to involve the public in the

process of environmental management.

These circumstances require the creation of a unified state system of environmental monitoring of the environment and natural resources, including all enterprises and institutions of departmental monitoring, as well as production monitoring using geographic information systems.

It is necessary to create a bank of environmental information for the effective functioning of a unified state system of environmental monitoring of the environment and natural resources in order to collect, systematize, analyze, store and disseminate information.

In addition, technical re-equipment of observation and measurement systems is required, the development of an existing system of normative legal acts for organizing the interaction of all interested state bodies.

Today, statistics are characterized by the absence of a modern methodological base in the formation of indicators, as well as their paucity, which does not allow to assess reliably the dynamics of changes in the state of the environment and natural resources [5].

For environmental education of the population, it is necessary:

- to provide access to environmental information by creating centers for environmental information, publishing periodicals and popular science literature, television and radio broadcasts;
- to form a system of environmental education;
- to create a system of training and advanced training of environmental specialists;
- to create a regulatory framework for environmental education and environmental awareness training.

One of the significant advantages of implementing an energy management system is increasing the company's investment attractiveness.

Thus, environmental management will make it possible to monitor periodically the impact on the environment, as well as increase public interest in the problems of the state of the environment in the region.

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确保高水平的人力资本以应对科技进步的挑战  
**ENSURING A HIGH LEVEL OF HUMAN CAPITAL AS A RESPONSE  
TO THE CHALLENGES OF SCIENTIFIC AND TECHNOLOGICAL  
PROGRESS**

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本文介绍了人力资本水平和质量的影响研究结果，作为应对与俄罗斯和整个世界经济形成和发展新技术秩序相关挑战的先决条件和因素。

关键词：人力资本，科技进步，数字经济，知识经济，教育，人类生活质量，安全

**Abstract.** *The article presents the results of a study of the influence of the level and quality of human capital as a prerequisite and factor in responding to the challenges associated with the formation and development of a new technological order in Russia and the entire world economy.*

**Keywords:** *human capital, scientific and technological progress, digital economy, knowledge economy, education, quality of human life, security.*

At present, Russia, together with other countries of the world, is at the stage of transition and formation of a new technological order based on the widespread dissemination of scientific and technological progress in the form of digitalization. If at the previous stage information and digital technologies affected only production sectors, now they have been introduced and integrated into almost all spheres of activity and life of society and the individual. Building an information society is already becoming an insufficient goal and task for the current and future sustainable and safe social development, the need to build it up and make the transition to a more developed knowledge society has become actual. (In the scientific literature, there are discussions about the relationship between the information society and the knowledge society, we will base our research on the statement that the knowledge society is a more progressive form of social development). According to the UNESCO report (Towards Knowledge Societies ..., P.19), the knowledge society is not limited to the components of the technosphere and certain market segments, but additionally extends to the system of diverse social, ethical, political, cultural and other spheres and areas of society functioning.

Transitional processes to a new technological order are accompanied by constantly growing in space and time streams of fundamental large-scale changes in activity, life, way of thinking, behavior and interests of man and society, complicating them, making them less stable and predictable. These changes impose on a person, on the quality of his personality, on his knowledge, practical skills, abilities, competence (general cultural, universal, general professional and professional), cognitive abilities, psychological state and health, new necessary and sufficient requirements, both for activating innovative processes, contributing to further progress, and the compliance of a person (otherwise, a person finds himself in the field of dangers associated with his ability to work, adaptation to new conditions, psychological stability, etc.) to the current and future period of socio-economic development. A person is promoted by scientific and technological progress to a leading position in socio-economic development. Human capital is becoming the main factor of production, the quality and level of human capital in the modern world economy determine competitive advantages in the markets of both countries, their integration associations, corporations, firms, etc., and an individual. Knowledge, abilities, skills and competencies become a commodity or a dominant component of the commodity value of goods.

At present, the world economy is under the conditions of the simultaneous influence of such factors as: a slowdown in the development of the global economy, an increase in trade wars, a decrease in the growth rate of labor productivity, a protracted pandemic with its influence on the economy, etc. Countries that actually have a high level of human and social capital, that is, they are able to develop a competitive innovative economy, have the prerequisites for a scientific and technological breakthrough and digital leadership (separation), which for a certain period of time will give socio-economic development greater stability, dynamism, security and, as a result, will allow achieving a higher level of quality of life of society and the individual.

A person in the economy is simultaneously a producer and consumer of goods, including the latest (innovative, creative), therefore, the level of human capital becomes a decisive factor in the development and security of a person, society and the state. A person needs to have sufficient potential to generate innovative ideas, then, on the basis of new technologies and technical processes, to implement them productively, and society (consisting of individuals), in turn, must be so competently prepared that, firstly, not reject (not be afraid of the advanced achievements of science and technology), but adequately perceive innovations. Secondly, to feel interest, a need, and therefore to present a massive demand for the latest goods. A person's unwillingness to correspond to any stage of this chain changes the person's motivation for action, and thereby creates a system of dangers (real, potential) for the development of society, the country and the person. Human capital is such a resource that cannot be accumulated in sufficient volume

in the short and even medium term. The level of human capital that a person and society actually has at the present time, to a large extent, was laid and formed in the past. The directions, rates and quality of development in the strategic period are being laid now, therefore it is so important for all subjects of management to pay constant attention to monitoring, improving the processes of modernization and the production of knowledge adequate to the goals and objectives of the progressive development of the economy and society.

Currently on the global, regional, individual countries, industry, corporate, etc. levels are already manifested and felt a shortage of human capital, as the main source of growth in labor productivity, and, consequently, growth in gross domestic product and gross national income. At the same time, the transition processes to a new technological order are traditionally accompanied by a decrease in the level of efficiency of the main socio-economic indicators and, as a result, by a decrease in the available resources of society for modernization and stabilization processes, and the achieved level of human capital is of particular importance for the continuity and safety of development. Human capital will be understood as knowledge, skills, abilities and other distinctive features of a person that contribute to the creation of personal, social or economic well-being (UNDP, 2004).

The main source of increasing the level of human capital is traditionally the educational process, which is currently not a point-like process, as it was before, but a continuous one, requiring a person to constantly renew his competence, knowledge, skills, and practical skills throughout the entire cycle of his life. (And it is not even limited to cycles of active life, digital universal competencies for a full-fledged existence in society are now necessary from childhood to the end of life, which was clearly demonstrated by the lockdown period in the COVID-19 pandemic.) It is now obvious that the modern education process, in principle, cannot be completely completed by a person in the process of active life, a person is doomed to constant learning, otherwise it will lag behind scientific and technological progress, which will cause a complex of individual and social negative really and potentially dangerous consequences (phenomena, events, processes).

Human activity in a society based on knowledge presupposes a steady increase in the proportion of the adult population who have received higher education. Higher education takes on special significance and value. A World Bank report argues (Building Society... 2003) that higher education helps to unite the nation by promoting social cohesion and trust in social institutions. It can be added that the social unity or integration of society in the current conditions of the development of the world economy and scientific and technological progress (for example, the decline in the number of EAN and its aging, the need to update the infrastructure, growing environmental problems, etc.) is the basic element of building a new superintelligent society ("Society 5.0"). This new society shifts the goal of its de-

velopment from the optimization of resources by one person (as it is defined in the information society or "Society 4.0"), to the optimization of society as a whole through the integration of not only physical, but also cyberspace (U. Noritsuga, 2017, P.3 -12).

Currently, a universal measure of changes in the level of human capital has not yet been developed, which takes into account in full all aspects of the abilities, skills, and business and personal traits of a person. Therefore, the indicator "average number of years of study" is often used for international comparisons, although it must be admitted that it has limitations in its application (for example, it does not assess the quality of education, proceeds from the judgment that each additional year of study equally increases human capital, etc.). Previously, the indicator "population literacy" was actively used, but due to the fact that many countries of the world have already solved the problem of population literacy, the very fact of literacy has become insufficient for effective and safe life of a person and a country, this indicator is losing its relevance. Russia, according to the international rating compiled by UNDP experts, in 2018 took the 40th position in terms of duration of study, and the average number of years employed in the economy was 12 years (that is, these years of study correspond to secondary specialized education and primary higher education), for comparison, obtaining a higher education (without a master's degree) takes 15.5 years. Austria is among the leading countries - the education cycle is 22.9 years, the number of years of study is 12.9; Belgium - 19.8 and 11.8, respectively; Ireland - 19.6, 12.5. There is an obvious direct relationship between the level of economic development of the country and the duration of education, the lower the level of economic development of the country, the less time the population spends on getting education. For example, in Nigeria, education takes 5.4 years, and the average duration of study is 2 years (World Ranking...). For comparison, in the USA in 2002 the share of the population aged 25-64 with higher education diplomas was 38% of the total population, in Russia it was 23%. In 2017 (according to the 2015 microcensus), the share of the adult population with higher education in Russia at the age of 25-64 was 30.2%, and in the age group from 25-34 it was 40.3%. In Japan, 30.2% of the population has a higher education in the 25-64 age group, 60.4% in the 25-34 age group, 30.2% in the 25-64 age group, 30.2% in the 25-34 age group, 69.8%. We see that in Russia the share of the population with higher education is at the level of a number of developed countries or even exceeds such countries as: France (21% and 44.3%, respectively), Germany (28% and 31.3%), Italy (18.7% and 26.8%), etc., but the lag behind the countries of innovation leaders is also noticeable, especially in the younger innovation-active group (20% from Japan, 29.5% from Korea) (Education in figures ...).

In the process of research, we see emerging trends in the Russian education

system, which may have negative and dangerous consequences in the medium and long term. There is a change in the attitude of the young part of Russian society to the need for higher education. According to Rosstat, for the period from 2010 to 2017, the number of students enrolled in higher education per thousand people decreased by 1.6%, and an increase is noted in the innovation-leading countries. For example, in 2010 in Russia there were 65 students per 1,000 people, then in 2016 - 46, in 2018 - 40; in Norway in 2010 there were 46 people, in 2016 - 53 (Russia and countries ..., P. 134-135). In March 2021, "Rossiyskaya Gazeta" Russian newspaper published sociological research data from the SuperJob company, from which it follows that 43% of Russian applicants plan to enter universities in 2021, 48% planned to enter universities last year, moreover, in 2010 there were 80% of them (in 2011 year - 65%. in 2012 -58, etc.) (Without a "top" ...). Thus, over the past ten years, there has been a tendency towards a decrease in interest and demand among young people to get higher education by half. At the stage of the formation of a new technological order and the massive introduction and application of the achievements of science and technology in life, insufficient competence of the population (general cultural, general professional, universal and professional competence) can become a factor in restraining the socio-economic development of the country and reducing the level of security of the system "man-society nature".

Our studies of the current and projected demand in changing labor markets and employers' expectations from applicants for modern types of work have shown that the most significant changes are undergone by a person's thinking, on which not only cognitive, innovative, adaptive abilities of a person depend, but also mentality, interests, lifestyle. and (social, economic, household) behavior. Labor on a mass scale (not individual, as now and in the past) will be of an obligatory creative nature. To meet the new requirements, a person's thinking must be: abstract, critical, environmentally friendly, systemic, algorithmic, network and computational, fast, error-free under constant stress, multicultural, multilingual, etc. (Khristolyubova, 2020, 2021) The combination of such mental abilities in a person will allow him to acquire universal personal and professional qualities and, if necessary, freely and safely change areas of employment; reduce the risks of erroneous and dangerous decisions (the danger field will decrease); will reduce the ecological footprint (which is already relevant); a person, despite the constant variability, uncertainty, multitasking and the complexity of the tasks being solved, to maintain health, spirituality, abilities and desire for constant self-development and self-improvement.

Note that the process of transition from obsolete to a new technological order is traditionally accompanied by the process of "creative destruction", which is based on overcoming the inertia of established production and social ties that restrain the arrival of new ones. This very ability to make and perceive changes is

associated with the thinking of a person. The rate of transition processes and the establishment of a new one depends on the level of potential, both of an individual and of society as a whole.

The nature of a person's thinking is laid down and determined from childhood in the process of education and upbringing, therefore, systematic and high-quality preschool, school and additional children's education is of particular importance. It is known that now the share of paid education is growing, that is, there is an orientation not towards full-fledged educational and expedient educational activities, but towards obtaining a commercial result. The commercialization of the education sector is mainly explained, firstly, by the established economic market relations in Russia, and secondly, by the increase in the cost of modern "digital" education. The sphere of education became an element of the sphere of services, which, as a result of its reform, entailed a change in the traditional relationship between teacher (teacher) and student. The influence of students and their parents on the composition and content of the educational and upbringing process begins to increase, changing towards the undeniable rightness and power of the student as a customer of educational services. This trend can lead to the fact that at all stages of the educational process, the educational process will adapt to the desires and interests of students and their parents, which is real and potentially dangerous to unpredictable consequences (social, economic, political, environmental, etc.) in the future. In March 2021, the Institute of Progressive Education published the results of special studies based on an online survey of Russian schoolchildren in grades 8-11 in 74 regions of the country, on subjects that schoolchildren consider unnecessary and would like to be excluded from the curriculum altogether. According to schoolchildren, such superfluous subjects are: life safety (70%); technology (60%); astronomy (40%), argue that a complex science is not useful in life; music and painting (15% each); drawing, physics, chemistry, mathematics (10% each, as they interfere with preparing for the USE), etc. (Schoolchildren told ...).

The education system should already now, in order to meet the needs of the modern and future labor market, offer training programs for the development of new qualities of human thinking. It is known that thinking is directly related to human speech, therefore, humanitarian education at all stages of education (starting from early childhood) should grow, despite the processes of optimizing resources for education and modern trends in the leadership of natural sciences in formative thinking.

The emerging negative trend serves as a signal for the adoption of operational regulatory measures by government bodies in the education system.

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疫情期间组织学生普通体育课的特点

## FEATURES OF THE ORGANIZATION OF GENERAL PHYSICAL TRAINING CLASSES WITH STUDENTS DURING THE PANDEMIC

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本文介绍了冠状病毒大流行期间大学生在体育运动领域的教育过程的特点。特别关注在自我隔离的大流行期间体育锻炼和改善健康活动的动机，增加独立完成节日任务的责任，集体参与感等标准，尽管偏远和在线模式。

展示了在线改善健康培训的结果，表明此类培训的可行性以及所提议的体育活动类型的高组织性。

关键词：一般体育训练，大流行期间的教育过程，在线健康培训

**Abstract.** *The article presents the features of the educational process in the field of physical culture and sports with university students during the coronavirus pandemic. Particular attention is paid to such criteria as motivation for physical culture and health-improving activities during a pandemic in self-isolation, increased responsibility for the independent fulfillment of the festival task, a sense of collective participation, despite the remoteness and online mode.*

*The results of online health-improving trainings are presented, which showed the feasibility of this type of training and a high level of organization of the proposed type of physical activity.*

**Keywords:** *general physical training, educational process during a pandemic, online health trainings.*

The pandemic of the coronavirus infection caused by the COVID-19 virus has forced a new look at the educational process around the world, including education in higher education institutions. One of the most important problems was the problem of organizing distance education for students, including in the field of physical culture and sports. As a result of the transition to fully e-learning, over the months of the pandemic, the volume of educational materials and their presentation, taught remotely, has changed by an order of magnitude, the processes of

introducing various methods of e-learning have dramatically accelerated, and previously known digital technologies and their technical solutions have been tested for the adequacy of their application in the audience.

During distance learning at the Department of Physical Culture and Sports of the Samara State Technical University in the period from late March to mid-April 2020, a distance education method was developed for students from the groups of general physical training (GPT), shaping, step aerobics), as well as assessment tools of students studying remotely.

To assess the quality of online training, questions were developed for the planned testing.

From April to mid-June 2020, in parallel with the use of the developed series of lectures and practical lessons in distance mode, SamGTU conducted a survey of students of GPT groups in the form of an online survey.

The introduction of distance education technologies at the Department of Physical Culture and Sport took place in several stages.

At the first stage, videoconferencing (on the ZOOM platform) was used to conduct lectures selected by the faculty for students of GPT groups with an emphasis on the specifics of building and independently conducting health-improving classes and using load control devices.

Further, communication sessions began to be recorded using the standard software capabilities of the ZOOM system and webinar servers. The recording of the lessons included the performance of practical exercises and comments on the specifics of their implementation for the students of the GPT groups.

The result was a completely independent educational product that could be used as a new method of distance learning in the educational process in the field of physical culture and sports. This educational product should be called a multimedia lecture with a video-audio sequence recorded during a real lecture or in a studio, more often using several video cameras.

Also, during the online classes in physical culture and sports, it was envisaged to carry out independent work by the students themselves.

One of the types of independent work of students from the GPT groups, along with shaping and fitness yoga, was Nordic walking.

In the process of distance learning when performing independent studies, the attention of students was focused on performing health-improving exercises with telescopic sticks, self-determination by students, the length of the sticks, depending on the health-improving tasks, as well as the length of the distance of the health-improving route and the pace of walking.

In addition, to increase motivation for remote health-improving classes and remote control at the Department of Physical Culture and Sports at SamGTU, it was proposed to use online health-improving trainings in Scandinavian walking.

Online trainings activated the following psychophysical features:

- the opportunity to take part in a properly methodically organized health-improving event, without violating the regime of self-isolation; free choice of time for participation;
- the ability to organize calls in the early morning hours or late evening hours, when contact with the population is minimal;
- choice of free place of participation;
- creative approach to drawing up your personal approach route;
- no need for material costs for travel during training and others.

At the time of the experimental work, the participants were offered a choice of numerous instruments to fix the tracks and the time of passage. So it was possible to use fitness bracelets (Apple, Xiaomi, etc.), sports watches (Suunto, Garmin, etc.). It was also possible to use a mobile phone, on which an application (fitness tracker) should be installed, which records the distance and the time to overcome it (Strava, Runtastic, RunKeeper, etc.). If the approach is carried out on an indoor treadmill, then use the readings of the sensors from the treadmill.

Screenshots and photographs from the gadgets used were sent to the organizers of the training at the indicated e-mail addresses or by the corporate mail of the higher educational institution.

As an example, we can cite the results obtained at online training among students of a special medical group. The training was attended by 56 people. Participants were asked to overcome a distance of 75 kilometers for a month (consistently from day to day) without violating the self-isolation regime. This task was completed by the students in full and on time.

During the first two weeks after the end of the training, a survey of students was conducted in order to obtain an express assessment of the new educational model. Students were asked to freely express their attitude to distance education, as well as formulate their proposals for improving this system.

The conducted research reflected the first reaction of students to changes in learning conditions, therefore, it should be considered that its results are still indicative in nature. However, the study was of certain interest, since it was carried out during the period of adaptation of both the students themselves and the teaching staff to new forms of the learning process.

Most of the students of the Samara State Technical University positively assessed the conduct of GPT classes in the new distance format. Moreover, they were sympathetic to the fact that in the early days there were possible shortcomings in the system, which needed further improvement. Among the advantages of the distance education process, the following were named:

- compliance with the regime of self-isolation and the risk of becoming ill;
- saving time and money for moving between the place of residence and the

- sports facilities where the training took place;
- reducing the level of stress arising from the implementation of control standards;
- the ability to choose the optimal pace of mastering the material, including re-addressing difficult issues, copying the material,
- availability of a larger volume of information resources, incl. foreign.

Evaluation of participation in health related online trainings showed that most of the surveyed students highly appreciated the feasibility of such training and the high level of organization of the proposed type of physical activity by the teaching staff.

Particular attention was paid to such criteria as motivation for physical culture and health-improving activities during the period of self-isolation, increased responsibility for the independent fulfillment of an individual task, a sense of collective participation, despite the remoteness and online mode.

Thus, in the educational process in distance learning, an important role is played by the organization of student's independent work in physical culture. Independent lessons are a promising and significant form of education in professionally applied physical training of a student.

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实践导向教育——培养合格毕业生的先决条件  
**PRACTICE-ORIENTED EDUCATION – PREREQUISITE FOR THE  
PREPARATION OF COMPETENT GRADUATES**

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该出版物侧重于教育技术的更新和大学教育的内容。今天，一所高等技术学校专注于将未来专家模型作为个人和专业素质相结合的系统愿景。同时，学生的大部分学习时间都用于以独立工作和社会技术为主的资格和专业、教育和研究、创造性活动。大学教育空间的目标和技术的这种变化使轻工业学院的（约 30%）有创造力的毕业生成为 KNRTU 的一部分成为可能。

关键词：高等教育，综合学科，个性化方法，技术，创造力，准专业活动，有竞争力的毕业生

**Abstract.** *The publication focuses on the renewal of educational technologies and the content of university education. Today, a higher technical school is focused on a systemic vision of the model of a future specialist as a combination of personal and professional qualities. At the same time, most of the study time of students is devoted to qualification and professional, educational and research, creative activities with a predominance of independent work and social technologies. Such changes in the goals and technology of the educational space of the university make it possible to prepare (about 30%) creative-minded graduates of the Institute of Light Industry as part of KNRTU.*

**Keywords:** *higher education, integrated disciplines, personality-oriented approach, technology, creativity, quasi-professional activity, competitive graduate.*

The socio-economic transformations being carried out today in Russia are aimed at ensuring sustainable development of the country, but they will not bring results if they are not consolidated by changes in the higher technical school. In this regard, the main goal of higher education is not the transfer of subject-organ-

ized knowledge, but the ability to find ways to replenish knowledge. At the same time, such teaching methods are actualized as heuristic, research, constructive, contributing to the development of an active creative personality of the student in accordance with its needs and interests [1,2].

Sociometric studies of the teaching staff of the Institute of Materials and Technologies of Light Industry indicate that students are actively involved in active teaching methods with great interest. The majority of students (72.3%), as shown by the results of the study, rather highly assess their capabilities and abilities, however, 28.7% do not pay due attention to continuous self-development as one of the factors of competitiveness, and about 8% have not decided at all in their plans for future.

The activity approach, as one of the main practiced teaching methods at the university, stimulates the activity of students and allows students to master the content of academic disciplines in the context of their future professional activities, which, in turn, eliminates the contradiction between the student's educational activity and the future professional activity of the graduate. The recommended topics of practical classes involve interdisciplinary connections and problems at the intersection of sciences, broadens the horizons of students in the field of national and world culture, and it is proposed to carry out certain topics of laboratory (practical) work in the form of mini-projects [3-5].

The fundamental principles of such activities are continuity (all stages of training are covered), a variety of forms and methods (game situations, situational tasks, role-playing games, practical exercises with a focus on society, quasi-professional activities), depending on the specifics of the classes, ensuring the rhythm of classes with continuous monitoring with the side of teachers [4].

Moral, ethical and humanitarian components in the content of special (technical) disciplines of future constructs, technologists, designers in the field of light industry are updated in fundamentally new integrated courses developed at the profiling departments, for example, such as "Design and technology in the fashion industry." The content of the proposed discipline forms a holistic view of the world, teaches you to evaluate your identity, preserve and develop national culture, stimulates the need for constant self-education. The methods inherent in the humanities, based on figurative and critical thinking, imagination, fantasy, expand the heuristic capabilities of students and serve as the basis for effective work in the field of course design and final qualifying work of a bachelor [6,7].

In conditions when the world ceases to recognize a person, and a person ceases to recognize the world, designing a costume based on folk traditions, mixing elements from different eras and cultures serves as an incentive for the emergence of exclusive models in the fashion world. An example of such an approach in teaching is the developed model of a woman's costume, which is made in the original Russian style using the ornament of decorative and applied art - "Gzhel". A model

of a suit with hand-embroidered "Gzhel" style on the collar, on the bottom of the dress and on accessories with a characteristic pattern and color. composition (blue, white and blue shades) is shown in fig. 1, 2. The performed embroidery is distinguished by the degradation effect (transition from a rich blue tone through light blue to white), which sets off the patterns. The blue color symbolizes greatness, loyalty, constancy. Blue is the color of peace, and white is a symbol of innocence and purity.



Fig. 1. Model of a dress-coat with trim in the style of Gzhel

The peculiarity of embroidery is its balance in color; in general, the picture turns out not to be monochromatic, but bright and lively. The model is completed with a muff, a belt with similar embroidery and a headpiece. A well-designed ensemble gives the effect of elegance and femininity to the image, sets you up for a positive. As a rule, more than 30% of the graduate qualification works of bachelors of the institute are distinguished by a non-standard, creative solution to the topic being developed, originality and compliance with the current consumer request.



a



b

**Fig. 2. Accessories of the code (a - detail of collar and bottom trim; b - muff trim)**

According to the results of the study, it can be stated that:

- in the modern teaching model, personality-oriented learning technologies, humanization and humanization of natural science and special disciplines, in particular, for graduates of the light industry are becoming especially relevant;
- the content and forms of classes implemented in integrated courses allow giving the educational process an independent, more creative character;
- to carry out the educational process in variable ways, depending on the individual characteristics of the personality;
- there is a constant increase in knowledge and the formation of aesthetic and moral qualities of the future specialist.

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工科大学生智力潜能开发的主要方向  
**THE MAIN DIRECTIONS OF THE DEVELOPMENT OF THE  
INTELLECTUAL POTENTIAL OF ENGINEERING UNIVERSITY  
STUDENTS**

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本文讨论了工程大学学生智力潜能开发的概念方向，与创新教育形式的使用相关，这些形式是在技术工程过程的新趋势背景下形成的。

关键词：学生的智力潜力，工程大学，创新技术，项目活动

**Abstract.** *The article discusses the conceptual directions of the development of the intellectual potential of students of an engineering university, associated with the use of innovative forms of education, which are formed in the context of new trends in technological engineering processes.*

**Keywords:** *intellectual potential of students, engineering university, innovative technologies, project activities*

Among the most pressing and controversial problems of the development of the intellectual potential of students of an engineering university is the lack of innovative advanced professional education, as well as the inability of students to independent educational and cognitive activities. As a result, ensuring the quality of training of specialists should be associated with the organization of practice-oriented training based on the widespread use of the latest pedagogical and information and communication technologies.

The directions of the development of the intellectual potential of students are determined by the adopted state program of the RF "Development of education for the period 2018–2025", where one of the main goals is the intensification of the education system of the Russian Federation in the International Program for the Assessment of Educational Achievements of Students. The development of effective methods for assessing the quality of education of graduates of engineering universities depends on the level of knowledge, abilities, skills and professional competencies, taking into account the peculiarities of engineering specializations.

Students of an engineering university, according to A.A. Prokhorov, should be

focused on global internationalization and digitalization in the system of engineering and technical education [5].

Conceptual directions for the development of the intellectual potential of students of an engineering university are associated with the use of innovative forms of education, which are formed in the context of new trends in technological engineering processes. Student innovation projects today must correspond to the modern trend, solving various kinds of problems. Programmable images and a biometric terminal, start-up projects bring innovative ideas to life in universities using the development of various stages of their approbation.

The concept of "potential" today cannot be considered without reserves, a set of opportunities, the choice of goals for achieving results, development and mastering of knowledge. The intellectual potential of a person is the ability to master new levels of knowledge of the world from the point of view of intellectual thought processes, as well as personality activities aimed at mastering various meanings and values in any business. Many scientists note that the intellectual potential is a body of knowledge that determines the skills and abilities of students from the standpoint of their desire for self-improvement in the context of the application of knowledge that determines the human thought activity from the standpoint of assessment and forecasting, as well as the advancement of hypotheses.

O.F. Piralova revealed that the development of professional competencies of various types and levels in future engineers is based on professional thinking - analytical, practical, creative, spatial and the ability to integrate knowledge at various functional levels. The author came to the conclusion that the modern system of general and vocational education should be based on innovative systems, models and technologies for training an engineer [4].

Today, without special knowledge of programming, IT technologies, it is impossible to develop the intellectual potential of students of an engineering university, which affects the implementation of their ideas in life. All technical projects of the youth of our university are forms of solving innovative problems, especially when it comes to creativity, aimed not only at popularizing science at various events, but also increasing the intellectual potential that affects the competence of digital production and project activities. This is aimed at the participation of students in hackathons, championships, engineering slams, master classes, university seminars, meetings with business partners of the university.

The methodological basis for building the innovative potential of the educational communities of an engineering university is the expansion of the interaction of the university with its stake holders, the development of network interactions with other universities in the macroregion. The training of elite engineering personnel is carried out in the context of the introduction of new technologies, in the framework of cooperation of the university with science and production.

Various training technologies for young professionals allow them to make decisions and make choices in engineering professions that match their training needs. This is indicated by a number of sources [1,2,3,6], which note that early specialization is one of the key features of education in Russia, where the choice of professional qualifications is ensured by obtaining better results in the context of students' orientation towards a narrow list of subjects. As a result, students can get the opportunity to lay a foundation in their choice of profession, future professional growth and career, which is especially important in engineering and physical sciences.

The emphasis on developing new courses is provided in engineering education at the expense of the changing needs of employers. To solve this problem, a stake is placed on the creation of new training programs that provide for the acquisition of special knowledge, as well as the improvement of teaching and learning in the field of additional vocational education.

An important place is given to teaching based on innovative pedagogical practices, where students receive practice-oriented education and the implementation of the "Engineers of the Future" programs. To better understand the expectations of employers, gain experience in an industrial environment, acquire special personal qualities and professional skills, the university implements engineering educational research clusters and laboratories. As a consequence, many students have a high interest in science and demonstrate high scientific and technical knowledge at an early stage of learning.

An important feature of engineering education is the involvement of representatives of the largest manufacturing companies, as well as sectors that are the basis of the modern industrial system, in teaching students. For this, the participants study the basics of optimization of production, management and organizational processes within companies, technology of fundamental updates, development and promotion of innovative products.

The intellectual potential of students of an engineering university is associated with the ability to evaluate technological processes, which forms the main directions of project thinking. Working with projects in an engineering university plays a key role, as it allows you to align synthesized and abstract concepts towards an effective mechanism and its practical implementation. Project thinking of an individual in conditions of development of intellectual potential contains the ability to correctly set goals and objectives, choose tools to achieve them, predict and predict the results of their work.

Modern design at the university is based on the receipt and use of new industrial materials, automated, intelligent, autonomous systems. The training of students is associated with many complex knowledge, which requires the renewal of all competencies: researchers, developers, engineers, technologists. Our students

work on projects on various topics: development of a technology for the production of nitrogen fertilizers, development of cleaning cosmetics with bactericidal and antiviral action, development of magnetic flocculants for bio-applications, development of a method for increasing the energy efficiency of chemical technological systems, development of a technology for the production of an alternative reagent for water purification and other directions.

All of these topics relate to the use of new developments and are based on global standards and practices for effective design and manufacturing.

At the same time, in the conditions of the development of the intellectual potential of students, it is important to combine the knowledge, abilities, skills acquired in the study of humanitarian and technical disciplines. An interdisciplinary approach to teaching, in this case, provides a synthesis of information-subject knowledge and an improvement in the assimilation of educational material by students.

So, we refer to the main directions of the development of the intellectual potential of students of an engineering university:

- implementation of additional educational modules based on project-based learning forms that form skills in the field of programming and algorithmic thinking. Training modules provide opportunities for building individual educational trajectories for each student, implementing a fundamentally new educational model based on the rapidly growing capabilities of digital technologies. Global competitiveness poses new challenges for reorienting engineering students to develop projects in both fundamental and applied research and professional practical projects in the fields of engineering, design, communications, software development, management, marketing, nanotechnology, medicine, etc.;

- the use of innovative educational technologies in teaching, allowing for the variability of the analytical and research structures of the personality and aimed at the formation of research and project competencies of students;

- approbation of real scientific results of students at various sites, competitions, seminars, allowing to identify the most talented students, focused on quality results;

- the application of an interdisciplinary approach to teaching, which forms a new research position aimed at expanding the external capabilities of students. This allows the creation of unique technology startups that form links with innovative systems for their implementation.

At the same time, the forms and methods of teaching students with high intellectual potential can change depending on the proposed technological chains, which allow gifted students to build an individual trajectory from the standpoint of the culture of creative work, knowledge and skills.

Thus, the considered directions of the development of the intellectual potential

of students of an engineering university allow us to conclude that new learning mechanisms should depend both on the methodology of education and on the ability of the university to create an infrastructure aimed at identifying the scientific and creative potential of students, competent methodological support and support of students in their independent educational and cognitive activities.

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现代条件下俄罗斯文化教育空间的发展  
**DEVELOPMENT OF THE CULTURAL AND EDUCATIONAL SPACE  
OF RUSSIA IN MODERN CONDITIONS**

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这篇文章致力于研究俄罗斯联邦文化和教育空间的特点。作者确定了有效利用传统艺术和手工艺的审美潜力以开发多民族国家的文化和教育空间的关键问题。特别注意对一种独特类型的传统应用艺术的科学证实 – “莫斯科字母”风格的装饰画，复兴，保存，其发展得到了传统艺术高等学校的使命的支持（学院）。

关键词：统一、多样性、文化空间、职业教育、传统工艺美术、莫斯科写作、艺术风格特征

**Abstract.** *The article is devoted to the problem of studying the peculiarities of the cultural and educational space of the Russian Federation. The author identifies the key issues of the effective use of the aesthetic potential of traditional arts and crafts in order to develop the cultural and educational space of a multinational state. Particular attention is paid to the scientifically substantiated description of a unique type of traditional applied art - decorative painting in the style of "Moscow letter", revival, preservation, the development of which is supported by the mission of the Higher School of Traditional Arts (Academy).*

**Keywords:** *Unity, diversity, cultural space, professional education, traditional arts and crafts, Moscow writing, artistic and stylistic features.*

The goal of the state policy of many countries in the field of culture is to support the development of the spiritual potential of society. Academician DS Likhachev noted in his scientific works: "The state is responsible for the self-renewal of culture in the country, for education, for the freedom of creativity with complete non-interference of the state in creative life. Culture in all its forms has the right to financial support from the state: support for education and the protection of cultural values, in the first place, and the culture of all ethnic groups living

on the territory of the state ... Culture represents the main meaning and main value of existence, both of individual peoples and states. Outside of culture, their independent existence loses its meaning" [1]. It should be emphasized that, according to D.S. Likhachev, culture is a huge integral phenomenon that makes people who inhabit a certain space from the common population a people, a nation.

It is important to note that the Russian Federation is a multinational country uniting representatives of 194 separate peoples and ethnic groups. Rich in a variety of ethnic and cultural and artistic traditions, modern Russia effectively supports traditional artistic crafts, recognizes them as the heritage of national culture and spiritual wealth. The diversity of traditions is not only the differences between nationalities, but at the same time their polycultural unity.

In this regard, in order to clarify the key concepts of traditional arts and crafts, communication and commonality of sociocultural phenomena, goals and objectives were determined to clarify the *diversity of the educational and cultural space components in the network higher educational institution of traditional applied arts in Russia - the Higher School of Folk Arts (Academy)*.

Each center of folk arts and crafts in Russia, developing in accordance with traditions and peculiar artistic and stylistic features characteristic of a particular type of traditional applied art and its region, is single and unique within the boundaries of a certain area, but at the same time it is one of the parts of a certain set and obeys the general laws of development, including economic ones. Aristotle noted that the common exists in an inextricable connection with the individual."

"The singular, the particular and the universal are not isolated from each other, but represent different aspects of a single whole. Without the individual, there is and cannot be the universal - the universal exists only thanks to the individual, through the individual." [3].

At the end of the XX century, much was said about the unity of various spaces: economic, political, and informational. D.S. Likhachev turned to the consideration of the problems of cultural space, by which he understood not only a geographically located territory, but, first of all, a certain space of an integral environment, which has length and depth, a "sacred field".

To reveal the **"sacred field" of traditional applied art**, we needed to determine what is the *diversity of a single system-forming educational artistic and cultural space* of traditional applied art? "Unity in Diversity" is a principle that reflects the essence and characteristics of our field of activity. Between the two most important components of the definition, the unity of two spaces is revealed: cultural and educational. Each of the spaces has its own components.

In the cultural space, the sphere of our interests is traditional applied art and its specific types, in the educational space - educational institutions of professional education that train artists for specific types.

Diversity means the plurality of manifestations of something uniform in its essence in various forms and forms; variety of something. Thus, in the study of the constituent components, *diversity* of the following was revealed:

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*types of traditional applied arts;*  
*artistic and cultural traditions (links between the past and the present and the future, old and new, traditional and modern);*  
*modern trends;*  
*interpretation of plots;*  
*the possibilities of translating pictorial motives and images into artistic language;*  
*artistic means (color, shape, technical features);*  
*generations of creative artists who preserve the collective artistic experience, traditions and spirit of art;*

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*ethnographic environment (unity within the borders of the country);*

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*the educational system at the Higher School of Folk Arts (Academy) - the only and unique university in Russia in the field of traditional arts and crafts (variety of levels and their unity);*  
*branches of HSFA (profiles, specializations);*  
*constituting the educational space within one educational institution: educational, artistic, regional, aesthetic, cultural, creative;*  
*aspects of educational activities;*  
*professional skills and competencies;*  
*requirements for the preparation of the graduate.*

Thus, the analysis of the study showed, firstly, the unity and unity, which consists in the integration of the types of traditional applied arts, leads to the strengthening of interregional ties and interpenetration, motivates the realization of internal potential, ideas, increases competitiveness, promotes progressive development and, Secondly, the issue of the strategic development of vocational education in our region is of great importance, on which the development of educational institutions as a whole depends, the basis for which in the modern environment should be unity in diversity.

In 2003, a historic event took place in the educational and cultural space of Russia: a unique institution of higher art education was created - the Higher School of Folk Arts (Academy). Within the structure of the academy, there is the Institute of Traditional Applied Arts - the Moscow branch. The aim of the institute is to provide professional training for artists of the institute of traditional applied arts - specialists in the profile of decorative painting, including in the style of

"Moscow letter".

Decorative painting "Moscow writing" has certain modern distinctive artistic and stylistic features, painting technique and figurative compositional solutions, indicating the uniqueness and exclusivity of decorative painting of Moscow products. Let's note these features:

- simultaneous execution of flat metal products (trays, panels, etc.) and small plastic products from papier-mâché with artistic painting: volumetric forms from traditional to modern, from flat to volumetric products, from pocket-scale products and small plastic products to items used for interior decoration;
- use of artistic brushwork writing and techniques in painting, such as:
  - ala-prima, through writing, dense multi-layer writing, mixed writing and miniature lacquer painting:
  - ala-prima – painting performed in one layer on wet underpainting;
  - through writing –painting, produced by layer-by-layer application of transparent layers of glaze paints on metallized powder, which allows obtaining deep colors, various shades and translucency of layers;
  - multi-layered writing – painting, allowing to achieve maximum realism and materiality by applying a large number of artistic and pictorial layers (from 2 to 3-4);
- use of polychrome multi-tone and monochromatic backgrounds for painting;
- use of metallized powders and pastes as a base for painting;
- realistic, worked out to the elements of a pictorial motive, with the identification of the main thing, the transfer of light and shade modeling of the form, the technical and pictorial execution of pictorial motives using an artistic stroke and the identification of color pictorial shades: plant, natural, landscape motives, portraits, etc.;
- transfer of plasticity of pictorial motives in accordance with their design, proportions and perspective, creating the illusion of naturalness;
- asymmetrical compositional-structural construction, free composition with free arrangement of elements;
- the influence of the historical styles of Rococo and Art Nouveau on the compositional and structural construction and color solution;
- a combination of floral and ornamental and subject compositions in the decorative design of products: an object, a set, a series, an ensemble;
- an expanded range of lacquerware with decorative painting intended for original artistic interior decoration: trays-panels of various shapes (round, oval with scalloped edges, rectangular, arrow-shaped, winged, etc.), wall panels, lacquer panels, tables, chairs, screens and other interior items for

individual use.

The artistic and compositional system of the Moscow style of decorative painting of products requires special knowledge, development and implementation in new and modern functionally relevant and popular products that serve not only for decorating the interior environment, but also for positioning unique types of modern Russian traditional applied art.

The training of artists of traditional applied art, preserving and developing the traditions of Moscow writing, had a significant impact on the revival of folk art crafts in Russia, enriching the modern educational and cultural space of the multinational state.

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掌握 N. K. MEDTNER 的钢琴作品作为音乐教师专业培训的必要组成部分  
**MASTERING THE PIANO COMPOSITIONS OF N.K. MEDTNER AS A  
NECESSARY COMPONENT OF THE PROFESSIONAL TRAINING OF  
A MUSIC TEACHER**

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文章探讨了高等师范院校音乐系学生掌握N. K. Medtner钢琴作品的问题。结果表明，在课堂上采用文化教学法和综合教学法可以提高学生的执行力发展质量。作为文化方法的一部分，建议在 N. K. Medtner 对历史和 文化中的传统和创新问题、先前时代精神和审美体验的音乐艺术的连续性、在作曲家和艺术家的音乐家的作品中，需要将哲学反思作为创作方法的基本基础。描述了所提议的教学方法在作曲家作品发展中的实际应用。

关键词：N. K. Medtner 作品，哲学和美学观点，钢琴课，学生，文化方法，综合教学方法，教学领导，掌握钢琴风格，学生。

**Abstract.** *The article discusses the issues of mastering of piano works of of N.K. Medtner by students of musical faculties of pedagogical higher educational institutions. It is shown that the quality of the executional development of students can be increased when using a cultural approach and integrated method of teaching in classroom in class. As part of the cultural approach, it is proposed to consider musical content in the context of the views of N.K. Medtner on the problem of traditions and innovation in history and culture, continuity in the musical art of spiritual and aesthetic experience of preceding eras, the need for philosophical reflection as a fundamental basis of the creative method in the work of the musician of the composer and the artist. The practical application of the proposed pedagogical approaches to the development of the composer's works is described.*

**Keywords:** *works of N.K. Medtner, philosophical and aesthetic views, piano class, students, cultural approach, comprehensive teaching method, pedagogical leadership, mastering piano style, students.*

Nikolai Karlovich Medtner entered the history of world musical culture as a wonderful composer, a brilliant pianist, an artist-thinker and a teacher who left the richest heritage, which is the focus of his composer, performing and

philosophical reflection. His creativity is facilitated by the classical traditions, heart-penetrated, truthfulness of the expression of feelings, refined sophistication, a combination of lyrical sentiment and romantic dreaminess with a tendency to the deepest reflections.

The largest part of N.K. Medtner's heritage is piano music, considered by researchers as the main means of translating the creative ideas of the composer. In this area he created three concertos for piano and orchestra, fourteen sonatas, forty fairy tales, three cycles of "Forgotten Motives" and a number of other miniatures. The variety of ideas inherent in Medtner's works, the sincerity of feelings and the depth of the composer's artistic and aesthetic revelations attract an increasing number of musicians, awakening the creative initiative of performers, teachers and students.

For modern students, the complexity of the performing mastery of the composer's works is due to unusual methods of presenting musical material, as well as insufficient awareness of Medtner's aesthetic views, his achievements in the field of content and means of artistic expression.

The relevance of the study is also determined by the lack of available literature, which considers pedagogical approaches to mastering the piano style of N.K. Medtner. In most of the works of domestic researchers, the analysis of the fabric of his opuses focuses on the technology of studying the means of musical expression [1]. The nature of the musical images of the Medtner's as special artistic and intonational phenomena today, from a pedagogical point of view, remains not so studied.

In this regard, the importance of thoughtful pedagogical guidance of the process of mastering the works of N.K. Medtner. A competent choice by a piano teacher of the necessary approaches based on identifying the internal and external connections of the musical content of Medtner's works with the metatext of culture can inspire future music teachers to a deep search for artistic meaning, direct them along the path of mastering the performing means of expressiveness necessary for its implementation.

The purpose of this research is the theoretical substantiation, development and testing of pedagogical approaches to mastering the piano style of Medtner by students in the process of solo instrumental training.

The study of the literature on the above problems, as well as the accumulated experience of working with students of the Moscow State Pedagogical University (MSPU), made it possible to suggest that the development of the piano style of N.K. Medtner in the piano class will be successful when:

- building the educational process based on a cultural approach;
- using a "complex" teaching method in piano lessons.

Based on the analysis of various interpretations of the concept of "cul-

turological approach" contained in the works of E. Bondarevskaya, N. Krylova and others [2; 3], the elements of content, methods and organizational forms were identified, which are necessary for the students to master the piano works of N.K. Medtner. These include:

1. Study of the organic connections of N.K. Medtner with the culture of the era in which he worked.
2. Revealing and differentiated analysis of the characteristic features and key themes of the composer's work.
3. Mastering musical content in the context of N.K. Medtner on the problem of traditions and innovation in history and culture; continuity in the art of music of the spiritual and aesthetic experience of previous eras; the need for philosophical reflection as the fundamental basis of the creative method in the work of a musician, composer and performer.
4. A detailed study of the figurative sphere of the composer's piano works, consideration of the features of the piano style through the prism of genre and means of musical expression.
5. Acquaintance with the peculiarities of N.K. Medtner-pianist, analysis of the author's performance of piano works.
6. The formation of the auditory experience of perceiving (comprehending) music Medtner through specially organized and pedagogically guided listening and subsequent analysis of interpretations of the composer's piano music by such masters as B. Berezovsky, E. Gilels, V. Horowitz, I. Zhukov, J. Zak, N. Lugansky, V. Safronitsky, S. Rachmaninov, G. Neuhaus, Yu. Ponizovkin, S. Feinberg, M. Yudina.

The "complex" teaching method [4] involves the use of all types of musical activity in the organic unity of piano lessons (music-performing, music-theoretical, music-historical, music-oriented poly-artistic, music-mediated), with an emphasis on performing.

These pedagogical approaches were implemented in the course of experimental search work with students. The study took place on the basis of the Faculty of Musical Arts of MSPU and consisted of three stages: ascertaining, formative and control.

At the ascertaining stage, a questionnaire survey of students was envisaged, aimed at identifying the initial level of students' ideas about the personality of N.K. Medtner and his multifaceted heritage. Along with the questionnaire, the audition of the performance of the works of Medtner by the students was carried out with an assessment according to the following indicators:

- awareness of performance, the depth of the embodiment of the composer's intention;
- compliance of the sound with the character and style of the music being

performed;

- possession of the tempo-rhythm organization;
- the embodiment of the integrity of the form (the ability to build the drama of an artistic image based on the logic of the deployment of musical content).

An analysis of the results of the activities carried out revealed a very superficial and undifferentiated knowledge of students about the spiritual image of N.K. Medtner, his composing heritage, features of the piano style, peculiarities of pianistic art, philosophical and aesthetic views, etc. A similar impression was left by the interpretations of Medtner's miniatures presented by the students: "Canzones-Serenades" from the cycle "Forgotten Motives", op 38 № 6, "Fairy Tales" in b-moll op. 20 № 1, etc. The performance was characterized by fragmentation, lack of poetic expression, insufficient flexibility and spirituality in the transmission of sound ideas, testifying to the superficial perception of the image, insufficient spiritual "attunement" of students with the deep world of the author's ideas.

The formative stage provided for the use of the methodological techniques developed by us in the lessons in the piano class and conducting specially organized conversations with the students. Our pedagogical efforts were aimed at expanding their thesaurus, accumulating ideas about the stylistic features of the music being studied, and improving performing competencies.

For these purposes, each of the students was offered the compilation of a specially developed "didactic passport" of a work containing tasks for analyzing the studied works from the standpoint of a cultural approach. In the course of filling it out, the students had to conduct a musicological and performing analysis of the works, answer questions related to the coverage of significant events in the composer's life, the key positions of the worldview, the genre of the work, the circumstances of its appearance, and the means of musical expression.

The main line of conversations conducted with students was the analysis of the main philosophical and aesthetic views of N.K. Medtner, who had a key influence on his composing and performing work. Familiarization of students with scientific literature [5; 6] allowed them to conclude that the most important channels for the formation of the composer's spiritual outlook were his:

- commitment to Orthodoxy, formed in many ways, under the influence of representatives of the Russian religious idealistic philosophy V. Solovyov and I. Ilyin;
- passion for the art of Antiquity, Italian painting of the Renaissance (cavases on religious subjects by Giorgione, Titian, Perugino, Raphael, Lippi, Michelangelo), Russian literature (A. Pushkin, A. Fet, F. Tyutchev), German romantic poetry and philosophy (I. Goethe, G. Heine, A. Schopenhauer, I. Kant), the ideas of Russian Symbolism (A. Blok, A. Bely, V. Bryusov, A. Scriabin).

The students learned that the composer presented his philosophical reflections in the book "Muse and Fashion" [7]. Here, Medtner's ideas about the laws of har-

mony and the criteria of beauty, the purpose of art and the high mission of the artist-creator were reflected. These views formed Medtner's artistic ideal, caused the Master's need to rely on classical canons, to create in an Apollonian manner, to resist in music the spirit of inertia and chaos, and the negative manifestations of modernism.

The clarification of the stylistic features of Nikolai Karlovich's music was facilitated by a discussion with the students of the characteristics of his piano style. Concentrating primarily on composing music for his favorite instrument, Medtner revealed himself in this area as a romantic poet with a bright, life-loving acceptance of the world. Ostrodynamic conflicts or deeply tragic concepts are not characteristic of his works. The lyrical sphere turns out to be the true element of the composer. In the center of the author's artistic world is the theme of a person with a dreamy and sublime soul, images of inspired youthful love, ecstasy with the joy of life and the beauty of nature. An irresistible charm gives many of his piano opuses a light fairy-tale haze, coloring them in ghostly-fantastic tones.

During conversations with students, Medtner's thematic issues were raised, a characteristic feature of which is the close interweaving of vocal and instrumental principles. He considered the topic as a seed containing the potential of form, and acted as "... the center ... in which the whole work is collected and illuminated" [Ibid, p. 153]. Along with the analysis of the melodic material, there was a discussion of the peculiarities of the harmonic language, the exquisite rhythm of Medtner's piano pieces, as well as the living, as if "breathing" texture, formed by gradually entering independently moving voices and echoes. The students got the idea that the composer found the ideal form for the embodiment of his ideas in the sonata, having realized in it the ideas of the synthesis of lyrics, drama and epic [8]. As a result, this led to the fusion of the sonata with other musical genres of elegy, ballad, fairy tale, which was reflected in the corresponding titles of the works "Sonata-Tale", "Sonata-Ballad", "Sonata-Elegy", etc.

The information about the characteristic features of the performing manner of the Medtner-pianist aroused genuine interest among the students. A brilliant graduate of the Moscow Conservatory, class of P. Pabst and V. Safonov, Medtner gave concerts for almost his entire life. In his performance, he found the implementation of the universal law of reconciling the diversity of elements in unity. This was expressed in the creation of a harmonious artistic picture of the performed work, where many details were organized by a common dramatic idea and were subordinated to a single center [9]. A holistic vision of the material helped the Medtner interpreter to reveal the concept of the work and convey its spiritual essence. The leading performing principle was the disclosure of the traditional "elements" and "meanings" of the musical speech of melody, harmony, form and rhythm inherent in music [7].

Listening to and analyzing recordings of Medtner's performances of his own works helped students to highlight the following distinctive features of his interpretive manner: intellectualism, masculinity, strong-willed rhythm, a kind of touch, harmony of the sound palette, masterful sculpting of form. In Medtner's pianism, the students were struck not so much by the enchanting sound of the piano and phenomenal virtuosity as by the improvisation and amazing spirituality of the playing. An important conclusion made by the students on the basis of the study of the recordings was the idea of the inextricable connection between the performing culture of the Medtner-pianist and the general concept of his work - "artistic religiosity" [Ibid.], Which is a reflection of the individual worldview and characteristics of the composer's thinking.

The next step towards comprehending the spiritual image of the Master was the acquaintance of students with the pedagogical views of Nikolai Karlovich. Despite the episodic nature, Medtner's pedagogy was very fruitful, as evidenced by the names of his students, who showed themselves excellently in the performing and pedagogical field (M.A. Gurvich, G.L. Lukomsky, B.E. Khaikin, A.V. Shatskes, and so on).

He comprehensively developed the artistic individuality of students, their creative imagination and fantasy, brought up the ability to subtly feel the music and think about the laws of its organization. He taught to construct an interpretation according to the principles of harmony of all elements within an artistic whole based on comprehending the logic of the development of a musical idea.

The listed didactic principles were reflected in the composer's notebooks, which were subsequently combined by his students into the brochure "Everyday work of a pianist and composer" [10]. It presents general attitudes in the pianist's activities, highlights the issues of working on individual elements of musical performance, sets out methodological recommendations for the development of the technical apparatus, reflections on the will in artistic creation, etc.

The real quintessence of Medtner's pedagogy was the attention to the beauty of the piano sound. In the work on sound, the primary role of the auditory factor, the need to "pull sounds out of the deepest silence by ear" was emphasized. An interesting feature of Medtner's pedagogy was the actualization of the method of playing with closed eyes.

The most important feature of Medtner's pedagogical system was:

- the obligatory presence of all students of the class in the classroom;
- the requirement for students to keep records, stimulating reflexive processes.

The knowledge gained had a positive impact on the results of the performing mastery of the composer's works by students. At the control stage, an assessment of the educational achievements of students was carried out. Thanks to the applied methods, the idea of the piano style of Medtner reached a different, qualitatively

higher level. A detailed analysis of the musical fabric in individual lessons stimulated the students' search for performing techniques to adequately convey the author's intention, which found expression in the plasticity of the melodic line, the flexibility of the tempo-rhythmic core, the subtlety of nuance, the variety of timbre coloration, and the building of a dynamic profile.

The experimental test carried out confirmed the hypothesis about the success of mastering Medtner's piano works when building the educational process on the basis of a culturological approach and an integrated teaching method. Their use in piano lessons made it possible to optimize the process of performing mastering of paintings by Medtner's students, to achieve a depth of penetration into the musical content, to translate the key features of his individual style into the performing interpretation. It taught students to think critically, to find their own strategies for mastering the artistic content of the works studied, to analyze in detail their own performing experience.

The pedagogical approaches developed and considered in the work make it possible to increase the productivity of the educational process, helping future musicians-teachers to creatively recreate the aesthetic essence of the composer's artistic images, to successfully solve the range of problems associated with penetrating the content of the work, performing the form, mastering the means of musical expression, solving technological problems. They are aimed at the formation of the spiritual "attunement" of students to comprehend a new style and contribute to a deeper comprehension of the author's idea.

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我国高校音乐教师培养过程中语调听力的发展  
**THE DEVELOPMENT OF INTONATION HEARING IN THE PROCESS  
OF TRAINING MUSIC TEACHERS IN COLLEGES IN CHINA**

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更新视唱练耳课程的教学形式和方法，是我国师范院校音乐教育体系现代化的方向之一。将音乐理解为一门语调意义的艺术，前提是有意识地对音乐进行语调能力的发展，这与视唱课中语调听力的发展密切相关。听力发展的传统方法：从纸上唱歌，写音乐听写充满了新的意义，并丰富了现代教学方法。通过对我国师范院校视唱练耳教学实践的分析，笔者提出了我国学生语调听力发展水平低的原因，并提出了改进方法和技巧。

关键词：语调听力；视唱练耳；中国师范大学学生

**Abstract.** *One of the directions of modernization of the system of music education in pedagogical universities in China is to update the forms and methods of teaching the solfeggio course. Understanding music as an art of intonated meaning presupposes the development of the ability to consciously intonate music and is closely related to the development of intonation hearing in solfeggio classes. Traditional methods of hearing development: singing from a sheet, writing musical dictation are filled with new meaning and enriched with modern approaches to teaching. The analysis of the practice of teaching solfeggio in pedagogical universities in China allowed the author to formulate the reasons for the low level of development of intonation hearing in Chinese students and to suggest methods and techniques for improving it.*

**Keywords:** *intonation hearing; solfeggio; students of pedagogical universities in China.*

The traditional development of ear for music in China's pedagogical universities is to improve students' musical theoretical knowledge in the process of teaching musical performance skills. Exercises and tasks within the framework of mastering the discipline of solfeggio purposefully develop ear for music, musical-rhythmic

feeling and vocal intonation [1]. However, in the process of mastering the content of the solfeggio training course, students experience significant difficulties. Typically, the problems are due to the individual differences of students and are as follows.

The basic musical education of students entering pedagogical universities for musical specialties is imperfect. Low level of musical theoretical training, lack of sight-reading skills, lack of understanding of the principles of intonation of musical texts.

The development of musical ear in Chinese students is mainly aimed at improving its analytical pitch side, and consists in the recognition and performance of pitch.

Currently, many students at pedagogical universities in China are trained in special courses in sight singing and the development of musical ear. Students master the skills of performing pitch, interval and rhythmic sequences, but the skills they have acquired are not very effective in direct musical practice. They have trouble intoning pieces in a vocal music class. The one-sided development of ear for music without relying on the emotional and semantic nature of musical intonation complicates the process of meaningful vocal performance, reduces its quality.

The use of solfeggio classes to methods purposefully developing the ability of emotionally conscious intonation, as a manifestation of understanding the semantic meaning of musical intonation in the dynamics of the formation of an artistic image, is aimed at solving the indicated problem. Today, in the development of intonational hearing among students in the solfeggio class, it is necessary to actively use the method of emotionally saturated study of each element of musical intonation.

Appeal to metaphorical characteristics in the perception of sound and intonation of intervals and chords, building associations (figurative, tactile, gustatory, color, olfactory) in the process of realizing the expressiveness of musical intonation, identifying gravitational sensations in the intonation of stable and unstable steps, their gravitation contributes to the development of sensitivity to perception individual elements of musical intonation, their connections, and as a result leads to an exacerbation and refinement of musical ear.

The highly developed ear of a musician is distinguished by the uniformity and fruitful interaction of both sides of the musical ear: analytical, associated with comprehending the sound form of music and intonationally holistic, providing penetration into the artistic and figurative meaning.

For the uniform development of both sides of the ear for music, it is effective to use tasks aimed at the formation of sensory images in the mind in the process of perceiving musical constructions. In this process, the relationship is manifested at the level of deep synesthesia. Synesthesia is a psychological process of combining

different types of sensory perception - auditory, visual, kinesthetic and others. Behind this lies the understanding of the ear for music as an ability for artistic and cognitive activity, and not as a receiver of a perceiving sound signal.

So, for example, when perceiving intervals, chords on the example of vocal works, students are invited to associate with color, characterize the interval with epithets, expressing a personal emotional and sensory experience of musical construction. All this contributes to the awareness of the emotional and semantic value of musical consonances, their meaningful performance. In the process of intoning any musical constructions, it is important to keep the mindset on "listening to oneself", to set the focus on the awareness of musical experience, since it is through living and experiencing that the possibility of knowing music as the art of intonated meaning opens up.

Musical rhythm is directly related to the heartbeat and emotional rhythm, therefore it is the most independent of all elements of the performance. Rhythm is actually an emotional experience that is emotional in nature. For example, cheerful music usually has a cheerful rhythm, while lyrical and sad music is slow and quiet. Rhythm is not just listening, it is a psychological experience combined with emotion and music.

For rhythm training, claps or steps can be replaced with other movements such as stomping or nodding, rocking, etc. The combination of body rhythm and auditory training can not only allow students to feel the rhythm of the melody and the rhythm of the music when body movements are combined with the rhythm of the music, but also to train students' sensitivity to impacts. and he can also perceive music in general, combining body with hearing. Different body movements can also express different musical elements. Different gestures can express different pitches in the direction and position of space, different parts of the body express different timbres, pauses represent rest, and continuation of actions can express the length of the sound. It can also be combined with visual synesthesia in training, for example using different patterns to express the emotional tone of a musical composition. The square shows that the rhythm is correct, the speed is average, the mood is courageous. The circle indicates smoothness, serenity and expresses a calm mood. Crisp and irregular graphics indicate syncopated rhythm, dynamic accents, and vibrant moods.

In addition, a variety of teaching methods are required to actively develop sight-reading and ear training. The choice of methods determines the direction of work, ensures its effectiveness and is an indicator of the teacher's professionalism.

With the development of technology and the emergence of standards in terms of data storage formats, it is possible to develop hearing using sound modules with large libraries of sound files (from individual sounds to musical pieces). For example, with the help of various MIDI multimedia software, it is possible to

organize an individual exchange of sound files between students and a teacher, diversify the learning process, make it as interesting and productive as possible. These techniques are more aimed at developing the pitch component of musical ear and implement a mechanistic approach. Ear training in this direction will undoubtedly contribute to its improvement, but there will be no changes in the development of musical thinking and in the upbringing of a musician. In the development of a musician's hearing, it is important to remember that it is not being that determines consciousness, but on the contrary, consciousness determines being. Translated into a research topic, this means: accurate reproduction of the pitch side of a musical text does not solve the problem of conveying its emotional and semantic meaning. Behind any musical intonation there is a thought that cannot be reproduced only by the "bare" absolute pitch.

That is why the development of the ability for meaningful intonation of pitch structures, that is, the development of intonational hearing, should become decisive in the development of a musician's hearing. Effective in the development of intonational hearing is the method of associative translation of auditory sensations into images of different modalities: auditory, auditory-visual, auditory-kinesthetic. In the process of perceiving a piece of music, the ability to build associative links is actualized, on the basis of which a polymodal image appears in consciousness, and the process of penetrating into the content of a musical structure deepens. The method of polymodal expansion of associative links contributes to the students' awareness of the content side of musical art, contained in musical intonation.

Thus, the basis for the development of intonational hearing in Chinese students in solfeggio classes should be their awareness of the emotional and semantic nature of musical intonation. This lays the foundation in the intonation of the conjugation of unstable and stable sounds, as an expression of semantic meaning in the relationship between tones. Correct sensation and intonation opens up the possibility of semantic, meaningful filling of intonation and is the basis for correct intonation of both a small musical structure and an entire musical form. Only through the awareness of the degree of tension in the relationship between tones, it is possible to approach the awareness of musical intonation, its correct reproduction, intonation [2].

The method of teaching the musical discipline solfeggio should be based on the nature of musicality, musical ear in the unity of its two sides, analytical and intonational-semantic. To implement this position, use the content, methods and techniques aimed at the development of intonational hearing, as the basis of musical thinking of a future teacher-musician [3].

In traditional listening teaching, teachers often emphasize the accuracy of listening to individual notes and individual rhythmic patterns only at a technical level, ignoring the overall musical sound and aesthetics. Communication with

music as a sound-semantic text is complex and rich. Music does not exist as individual notes and rhythms. In terms of musical aesthetic experience and musical perception, the overall musical experience must contain deeper connotations, musical listening with aesthetic understanding and the ability to express oneself. Thus, it is not enough to have only subtle perception and the ability to analyze the elements of auditory experience. It is necessary to develop a comprehensive sense of music and to shape the ear of a musician with a highly developed intonational ear.

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创新银行时代的人类社会生活  
HUMAN SOCIAL LIFE IN THE ERA OF INNOVATIVE BANKING

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本文探讨了与互联网的引入和广泛使用相关的现代社会转型问题及其在人类生活各个领域的的能力，从日常生活到银行服务、商业和一般经济。作者认为网上银行是一种社会现象，它将人们的生活引向一种性质不同的关系。网上银行的特点，它的优点和缺点是显露的。

该作品还考察了现代技术世界中社会生活转变的社会哲学基础，分析了决定生活质变的原因。这组作者认为，电子系统渗透到所有领域导致有必要寻找组织人际关系的新形式。使用高科技需要个人的高度准备，他在灵性层面的成熟度和责任感。

关键词：远程银行、电子银行、网上银行、社会转型、信息社会、文化、精神

**Annotation.** *The article examines the issue of the transformation of modern society in connection with the introduction and widespread use of the Internet and its capabilities in all spheres of human life from everyday life to banking services, business and the economy in general. The author consider Internet banking as a social phenomenon that leads people's lives to a qualitatively different type of relationship. The features of online banking, its advantages and disadvantages are revealed.*

*The work also examines the socio-philosophical foundations of the transformation of social life in the modern technogenic world, analyzes the reasons that determine the qualitative change in life. According to the authors, the penetration of electronic systems into all areas leads to the fact that it is necessary to aim at finding new forms of organizing human relations. Using high technology requires a high level of preparedness of the individual, his maturity in the spiritual plane, responsibility.*

**Keywords:** *remote banking, electronic banking, internet banking, social transformation, information society, culture, spirituality.*

## **Introduction**

One of the characteristic features of social development in modern civilization is the digitalization of being, that is, the translation of being into the language of numbers, the accelerated and ubiquitous development and distribution of distance technologies. The Internet, which is a global network, has had and has a tremendous impact on all areas of human activity, including daily routines, economics and business. In the context of digitalization, it is necessary to touch on a new phenomenon, which quickly became for people close, clear and necessary; this is a remote banking service, "Innovative banking".

The banking sector, as well as other spheres of social life, is developing along the lines of the latest changes and scientific and technical breakthroughs. (Digital Russia: New Digital Reality, 2019).

## **Opportunities and technical support of Internet banking**

The fundamental principle of remote banking service is the exchange of various information between the client and the bank at a distance and the execution of various transactions. Of particular importance in this matter is the provision of a high level of security and confidentiality of communication. (The phenomenon of globalization. Edited by E.M. Mikhailova, 2017)

The clients have extensive capabilities in such operations as, for example, remote access to their accounts, transfers, payments, management of deposits, as well as information reception about exchange rates or the location of nearby ATMs, etc. (Eremin, 2018)

To use the marked remote banking service facilities, the client needs to have access to mobile and Internet connections, as well as a technical device with appropriate software and a specialized software product provided by the bank. Experts call the remote banking service e-banking, the term Internet banking also appeared. These concepts quite accurately reflect the essence and character in the banking sector. Here the banking sector's dependence on the level of development of high technologies and technical innovations is clearly visible, enabling customers to carry out transactions online. (Kirichenko, Bulavenko, 2019)

In the modern technogenic world, the main forms of remote service in the banking sector are online banking using mobile communications, via the Internet and special self-service devices (terminals and ATMs).

## **Advantages and disadvantages of Internet banking**

Many studies conducted by analytical companies indicate a rapid increase in the number of online operations, which are becoming the dominant trends in modern society. In addition, nowadays online-banking from a popular add-on is transformed into an inseparable component of retail banks (in this regard, it can be compared with bank cards when they first appeared). The set of functions and comfort in use led to an increase in interest from the client base.

One of the purposes of internet-banking is to improve the quality of customer

service. Innovative banking has the following advantages: high level of efficiency; time saving; payments without delay; payments made in any cities and countries of the world; the ability to conduct various operations 24 hours a day without visiting bank offices; implemented procedures tracking; non-cash payments; management of various accounts in parallel; money transfers; round-the-clock control of own accounts; the ability to open an account in any bank.

Modern Internet banking is also convenient for the client because there is no need to have cash anytime and anywhere. (Kirichenko, Bulavenko, 2019)

Of course, Internet banking, with so many benefits, is attractive to cyber criminals. Therefore, the modern system of internet services provided by the bank should provide reliable protection of customers' financial assets.

Compared to the United States and Europe, remote banking in Russia is somewhat lagging behind, but it is still developing at a rapid pace, banks are successfully developing the Internet space, the quality of services is increasing, so does the level of service.

Like any other complex social phenomenon, Internet banking, along with the marked advantages, also has negative sides, creating certain risks. The disadvantages of remote banking include, for example, the inadequate protective mechanisms of the client base and their funds from cyber-fraud, the lack of competent guidance on using the Internet banking system, psychological difficulties causing fear and mistrust among customers, problems in using digital signatures, etc.

### **Socio-philosophical foundations of the transformation of social life**

In the modern technogenic world, the problems that determine the qualitative change in the daily life of a person have deep social and philosophical roots.

In the social environment, people communicate, experience feelings, think, and acquire themselves. This process establishes the existence of people, undergoing a complex and significant transformation. The real spatial boundary, which was originally given by nature, escapes the humanity. The true border of reality begins to lose its meaning. The life of people has shifted to the plane of social and communicative spaces, which is supported by various technologies and technical equipment. In modern life, people are inseparable from technology. There is a merger of people with technology. (Ioseliani, 2019)

Today, people are studying reality, while actively using technology. The technology has enormous opportunities, but at the same time it takes people into slavery. Observation of the world of nature is no longer interesting to man, like a round-the-clock immersion in screens.

New information technologies integrate the world into global networks of instrumentalism. Communication carried out with the help of various methods of computer technology, has led to the emergence of a large number of communities that exist exclusively in the virtual world. (Ioseliani, Tskhadadze, 2019).

Thus, modernization is not limited to economic and political changes; it is not completed by them. The internal content of the process of modernization, as a development, constitutes a change in the value priorities of the individual.

The new society, emerging in the framework of such a transformation, is both capitalist and informational. In different states, such a society forms an abundance of characteristic variations, according to the specifics of national institutions, national culture and history in accordance with information technologies.

One of the definitions of people is “homofaber” - a creature that makes an instrument for the immediate relief of work and life. That is, technology is a tool that allows one to achieve great results with minimal loss of power. The problems of the people of our era are connected with the fact that the means of life often comes to replace the goals of life. It can dominate to such an extent that the goal is erased over time from human consciousness. The technical purpose of life does not exist. There may be only technical means. The goals of life in any case will be in other areas, areas of the spirit.

The new picture of society presented by scientists and futurologists is gradually acquiring certain features:

First, a unified computer and information community is formed of people who live in houses equipped with various electronic devices and various "intelligent" devices.

Secondly, new industries, which form in the framework of the use of information technology and high-tech industries develop.

Thirdly, the cultural content in social development is changing priorities within the family, the development of virtual museums and the use of various forms of human interaction change.

Fourthly, the process of ensuring the daily lives of people is carried out using innovative principles and means of production, payment for goods and services (for example, electronic money, Internet banking, mobile banking, WAP banking, SMS and others)

These changes, exerting a complex effect on the whole of society, lead to significant changes in the industrial and spiritual life of a person.

Technology, technological innovations, widely available information increase the adaptive properties of individuals to the increasing volumes of knowledge, but the power of nature of a person decreases due to the organization, "rationalization" of working conditions, creating comfortable living conditions. N. Berdyaev speaks quite vividly about this: “Technique is the culprit of the terrible defeats of spiritual life, and, above all, of emotional life, of human feelings. In modern civilization, the extinction of the sensuous and emotional elements takes place ... It is difficult for the Heart to withstand touching the cold metal, it is not able to exist in a metallic environment.” (Berdyaev, 1994)

Mass use of computers provides access to information, relieves people from routine work, speeds up the adoption of optimal decisions, and automates the processing of information. As a result, the driving force behind the development of society is the production of not a material, but an information product. As for the material product, it becomes more “informationally capacious” and its cost largely depends on the volume of innovations made in its structure. People’s activities are mainly focused on information processing, and the production of energy and material products is entrusted to machines.

Information is a powerful tool that allows you to influence people and society. The owner of a large amount of information on a particular issue has an advantage over other people.

The way of existence of a person in terms of history is characterized by the following relationship: man - instrument - technology. Over the centuries, the collection and systematization of certain information relating to what surrounds a person helped us to survive in difficult circumstances: the ability to manufacture tools and hunting were handed down from generation to generation, clothes and healing tools were created on an ongoing basis. The amount of information is constantly updated, incorporating new information - each analyzed phenomenon provides an opportunity to switch to something new, to a phenomenon with a more complex structure. Over time, an abundance of information about the world around us led to scientific and technical progress. The society progressed: at some point people learned how to manage various types of energy and matter.

The modern world, as a result of the development of practical human activity in historical terms, is a space that is informational and technologized. It is important to understand that the man himself managed to technologize his nature. It exists in a space that is technically conditioned. Man realizes himself on the basis of the laws of nature, as well as on the basis of the laws of the technical sphere.

The transfer of information data is one of the decisive nuances of the formation of such an environment, the existence of a person within it. Over time, the importance of information in people’s lives became more and more vital.

There was a need to explore and realize not only natural laws, but also the values and concepts of society (we are talking about architecture, art, books, etc.).

In this context, it is necessary to point out some negative consequences of the computer revolution in the traditional mode of existence. These include the fact that writing (including books) fade into the background, giving way to the Internet and typing characters on keyboards.

The emergence of new forms of communication, transformation in the usual set of traditions, the transformation of social values - all this is carried out so quickly that the mass consciousness of society, as well as many experts studying these processes, call the computer revolution just as a crisis of culture. If in the

past, cultural adaptation to innovative phenomena was mostly stretched out (fast transfer, assimilation and dissemination of a large amount of information were impossible from a technical point of view), then at the moment we see that the speed of mastering all the benefits of world culture has increased dramatically. The growth was so great that many theorists began to raise the question of the potential of the human psyche to take it all. This question is considered topical.

There is no doubt that the culturegenesis of the XXI century cannot be imagined without the use of personal computers, information technology, the Internet and TV. With the help of these funds, the ability to choose the flow of information is translated into reality. These factors on the perception of the world by man act in different directions and not positively in all cases. Thanks to these factors, the time of social existence is accelerated to a significant extent: the human psyche is driven into an increasingly strict framework.

Recently, it has become obvious that interest in the capabilities of artificial intelligence has increased. The main reason for this phenomenon is that increased requirements for information systems. Home appliances are becoming more complex, as the software goes "smarter."

Development trends in the field of information provide an opportunity to make an assumption that, for example, the political power obtained by the majority based on the concentration of information data will reduce the value of elections and the value of the real power of politicians and tribunes. The ruling circles, formed in this way, can turn into an infocracy (when information is assigned the main role). This is the source of power, which has no authority upon the people. It has only a wide potential for the application of information data.

As an example, we can observe how the oligarchs are fighting for the media. Each of them seeks to acquire television channels, newspapers, radio stations. Super rich people see this as a guarantee of political power, which is based on the possession of a large amount of informational data, guarantees that allow one to manipulate information.

Due to the fact that electronic systems penetrate into all spheres of human existence, we need new forms of organization of human relations. Work with high technology requires high preparedness, spiritual maturity and personal responsibility. If harmony is broken in the direction of technology (it develops faster than the moral resources of society), then various aspects of human existence are dehumanized.

Moreover, computers form not only deserted production processes. It is also about the formation of "deserted" communication (instead of the interlocutor, we see the PC). We see how distinct forms are acquired by a new reality based on computerization (virtual reality). This is an artificially created pseudo-environment with which one can communicate as with a real environment.

Computer technology becomes part of the life of a modern person from the earliest years: these machines replace the theater, books, friends, reducing the intensity of traditional communication. Computers form another reality that can be taken more seriously compared to the outside world. This environment has a powerful influence on the human psyche (this influence is impossible to predict). At the moment, this perspective becomes obvious. In addition, in the phenomenon of immersion in virtual reality with an abundance of pseudo-varieties of human activity (as an example, people who are headlong immersed in computer games, turning into a kind of zombie).

The information society dictates new rules to man. This, first of all, is about the readiness to change activities, the ability to maintain a high level of mobility, the ability to relearn and study new professions. At the last stage of development, the value of such skills was not so relevant.

The anthropogenic civilization is based on the following: man is the main value of the functioning of society as a whole and its individual subsystems.

A person, as a being who has responsibility, in all cases makes any decisions related to the transformation of the environment. However, the infosphere makes its own adjustments to this state of affairs. (Ioseliani, 2018, 2019)

Intellectual systems do not just store information data. They exploit it in order to make decisions and look for answers to existing questions. They are able to cooperate with other systems, to receive information, about which there was no speech at the initial formulation of the task. Even today, the decisions that machines find are often not made by people. It is all because people do not understand the basic principles of its receipt.

It is possible that in the future there will be such reliable machines that the need for human intervention will disappear.

However, with such a development of events, the risk of degradation of people's skills, degradation of their ability to react to external changes and make management decisions in case of serious failures may become obvious.

Another problem related to intellectualization concerns the educational level of society members (the requirements for their qualifications and competence will increase).

The need of society for unskilled labor will decrease. At the same time, it is important to answer the question: does everyone have the ability to use high technology? It is possible that people deprived of this ability will be among the unemployed. As a result, the society will have to protect them, to support them. Moreover, some experts believe that the massive integration of expert and information systems can lead to the emergence of "parasites". Such "intellectual drones" will fully trust the machines, refusing the efforts of the intellectual plan. It is not yet clear whether it is worthwhile to consider these assumptions seriously, but it is still

impossible to indiscriminately dismiss such thoughts.

Man's aspiration to computerize his existence cannot be stopped (and it has always been so).

Would humanity become too dependent on soulless machines? Will we not become slaves of computers? What physical, psychological and social impact does rapid computerization have on us? How to protect a person from the huge masses of information that falls on him every day? Can modern advertising be called a kind of violence against human consciousness?

Some experts argue that the computerization process has a negative impact on people and society.

For example, V. Volpert states the following: computers have a negative impact on the psyche and creative skills of people, cause serious psychophysical abnormalities, hit on life activity, destroy creative nature. (Volpert, 1984) Other scientists believe that these claims have the right to exist, but all these problems can be solved. For example, K. Hefner proposes to create a humane-computerized society, to form humane and carefully developed relations between computers and people. (Haefner, 1984).

Future development should be based on the following: humanity must preserve the treasure that is presented to us by the process of evolution. This is, of course, the life of mankind. However, this does not mean that it is necessary to urgently abandon research and innovation. We must provide a new approach to such phenomena. It is just important to understand that the end and the beginning of all stages of development of any scientific direction on an ongoing basis transform into each other.

### **Conclusions**

Transformation and digitalization of public life, the introduction of distance technologies are not limited to economic and political changes, they are not completed by them. Profound and ambiguous changes occur in all spheres of being, in people's communication. However, in these processes the most significant changes undergo the value orientation of the individual, as the core of the modernization process. Thus, a new society, which form within the framework of such transformations, creates a large number of specific variations in accordance with the distinctive features of national culture and history, as well as with relations with digital technologies.

Intellectual systems can influence and drastically change social everyday life, but the question is what kind of influence is it and how much a person is protected as a thinking being.

Technical civilization dictates its values and priorities. One of its main priorities is a new social space, a new type of communication, other conditions of social being, which determine the priorities of competition, rivalry and benefits.

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个人职业文化与跨文化交际融合的普遍方面

**UNIVERSAL ASPECTS OF THE INTEGRATION OF THE PROFESSIONAL CULTURE OF THE PERSON AND INTERCULTURAL COMMUNICATION**

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本文考察了研究“人的职业文化”概念的方法整合的各个方面。我们尝试在跨文化交际的框架内对其进行研究。同样在文章中，我们从跨文化交际的角度分析了组织文化与职业文化之间的关系。此外，我们描述了实施综合教育技术以培训专家的经验方面。在文章的结论中，我们发现了医学和教学专业文化之间的相似之处。

关键词：人的职业文化，跨文化交际，整合，跨学科联系，整体方法

**Abstract.** *The article examines aspects of the integration of approaches to the study of the concept of "professional culture of the person". We made an attempt to study it in the framework of intercultural communication. Also in the article we analyze the relationship between organizational and professional culture from the point of view of intercultural communication. Moreover we describe empirical aspects of the implementation of integrative educational technologies for training a specialist. In conclusion of the article we found similarities between medical and pedagogical professional culture.*

**Keywords:** *professional culture of person, intercultural communication, integration, interdisciplinary connections, holistic approach.*

In the article aspects of the integration of the professional culture of the individual in the framework of intercultural communication are discussed.

The studying of various aspects of business ethics and professional ethics has actualized for us the need to identify the relationship between business ethics, professional culture and intercultural communication.

Besides having analyzed numerous publications, inquiring of various aspects of professional culture, we noticed that their study is carried out using different methodological principles and approaches, there is no single basis for identifying

the structural and functional components of professional culture.

The most complete volume of aspects of the study of professional culture, in our opinion, was made by E.V. Ivanova, Siberian Federal University[1], and also by V.Y. Kochergin and A.Y. Patseeva, Minsk [2]. Exploring the concepts of D.A. Erokhina, G.M. Evel'kina, A.I. Kravchenko and I.M. Model, E.V. Ivanova concludes that there is a relationship between professional skills and the general level of human culture, which is embodied and implemented in professional activities[1].

V.A. Slastenin, based on the general directions of the study of the phenomenon of culture, distinguishes three aspects of the study of professional culture: axiological, technological and personal-creative [1].

V.F. Isaev, in turn, focuses on the specifics of the application of the culturological approach in the field of professional education [1].

I.A. Zimnyaya identifies a tiered approach that determines the structure of professional culture: basic, personal and social, determines the criteria for the formation of skills and abilities at each of the levels, considers key criteria for assessing the theoretical development and practical application of its principles and rules [1].

We, in turn, believe that such a classification of the components of professional culture, including the applied components of its systematization, measurement and assessment, refer to the technical aspects of professional culture.

In our research, we set ourselves the goal of focusing on the personalized aspects of professional culture, to analyze the relationship between organizational and professional culture.

Studies of organizational or corporate culture are now also widespread, but they mainly focus on aspects of organizational behavior and interaction, and not an analysis of individualized practices of integrating a personality in a professional environment.

O. A. Zhilyaeva gives in her article the following definition of professional culture, which she considers the most complete. "Professional culture is a certain set of worldview and special knowledge, qualities, abilities, skills, feelings, value orientations of a person, which find their manifestation in his subject-labor activity and provide a higher efficiency" [3]. At the same time, she considers the ability to synthesize theoretical professional knowledge, practical skills and abilities in conjunction with the abilities and qualities of the person as one of the criteria of professional excellence.

She also connects the professional success of the person with the mastery of the norms and rules of the language and the general culture of speech, developing universal social interaction skills necessary for any qualified specialist.

In addition, this article actualizes the issue of a professional's activity in the context of social changes, his ability to correlate norms and values expressed in

people's actions with the norms of social behavior and their influence on professional relations. This is another aspect of the analysis of the development of professional culture.

Also relevant is the question of the development of professional culture skills and aspects of the synthesis of individual, personal and professional qualities in a modern information and communication environment, within which a constant change of images, ideas and meanings is carried out. Under these conditions, a person finds himself in a situation of uncertainty, which can be interpreted positively as the possibility of creative chaos in the systematization of experience, as well as the acquisition of a large number of opportunities for the creation and implementation of new forms, ways and methods of realizing professional experience.

In our article, we would like to analyze the readiness of students to implement this type of skills and abilities in their future professional activities and also to look at the empirical aspects of the implementation of integrative educational technologies for training a specialist.

Another aspect of professional culture, described by Shumakova O.A. [4], related to the transfer of accumulated knowledge into experience, seems relevant to us.

Therefore, this article summarizes the author's experience in the Bukhara State Medical Institute (Republic of Uzbekistan). The author was entrusted with teaching several social and humanitarian disciplines (professional ethics, sociology and logic) to students of the "Clinical Psychology" field of study. Teaching was conducted in Russian, while students had different levels of proficiency (from advanced to elementary). In this regard, it was necessary to apply the methods of team, group work, including in the course of solving situational tasks, which consists in the fact that students who were fluent in the language explained the order and conditions for completing the assignment to other students who do not know the language well.

Therefore, many tasks (in particular in the course of logic), for example, the study of a variety of concepts, were presented by us in the linguistic aspect.

In addition, in the course of teaching these three disciplines, we identified a large number of interdisciplinary connections (for example, within the logical foundations of moral choice or logical aspects and ways of combining general scientific and specific scientific methods and approaches within the framework of sociological research).

The greatest number of interdisciplinary connections, in particular, is revealed in the course of studying the topic "Conflict". The causes of conflicts are social factors, intercultural, psychological components and linguistic reasons.

Within the framework of the discipline "Professional ethics" we examined the

structures of the personality of the psyche, giving rise to a clash of its internal motives with the demands of society, manifesting themselves in moral dilemmas, within the discipline "Sociology" we considered theories that emphasize the positive or negative impact of conflicts on society and the personality inside society. Within the framework of the discipline "Logic", we considered semantic and linguistic barriers that lead to discrepancies in communication and create opportunities for conflict. Such actions can occur intentionally or unintentionally. We also learned to recognize correct and incorrect methods of interaction in situations of professional communication, to identify manipulative methods and tactics of behavior and to counteract them. We performed similar tasks both within the framework of the discipline "Logic" and within the framework of the discipline "Professional ethics".

In general, consideration of conflicts from the point of view of logic and professional ethics allows us to identify their universal components, manifested in the language and culture of speech. These are normative, communicative and ethical aspects, the correct application of which contributes to the prevention of conflicts as well as their competent resolution.

The normative aspect helps in situations of the correct choice of linguistic means in accordance with the norms of the literary language, the communicative aspect assumes a competent choice of communication tactics and the correct selection of language and speech means in accordance with the goals and objectives of communication, ethical assumes the choice of suitable strategies and practices of behavior in situations of communication. Thus, the use of this approach is especially relevant for teaching the humanities in the course of intercultural communication. All of the above allows us to conclude that the material we give has an integrated and complex nature, we determine the need to identify intersubject connections and demonstrate them to students, as well as stimulate them to search for such connections, including in situations of intercultural communication.

Also, based on the generalization of the acquired experience, it can be concluded that there are common features between the medical and pedagogical professional cultures. What these professional cultures have in common in the current situation is the presence of an overabundance of social information and the need to urgently make decisions in a situation of such an overabundance.

As well as in medical and pedagogical professional cultures, a contradiction between traditions and modern trends is revealed. At the same time, the development of both areas is directly related to innovations, but innovative activity in them often does not meet with support and is associated with significant resistance both from the state and society, and from the teachers and medical workers themselves. Therefore, the introduction and spreading of innovations in these areas of activity each time involves a combination of individualized strategies and approaches.

In addition, both types of professional culture imply close interconnection and integration with society, because they are associated with the psychological well-being of the individual, and also involve solving issues of safety, life and health of people. Therefore, none of the representatives of these professions can be isolated from communication with family members of their wards and must always be ready to explain the tactics and strategy of their actions.

Among other things, both in medical and pedagogical practice, the introduction and spreading of integrative and holistic approaches that have a philosophical rationale, create a holistic view of the human personality and its nature in order to create conditions for maintaining its health and quality of life, is of particular relevance, and also intellectual development.

At the same time, the personal qualities of the specialists themselves in both of these areas begin to acquire a decisive importance. They are expected to have the highest level of competence and professionalism, and also make high demands on their moral and ethical appearance. In this regard, the risk of professional burnout of a specialist greatly increases, which makes the problem of defining the boundaries of personal and professional activities actual. This, in turn, acquires special significance in the situation of the spread of modern information and computer technologies. The solution to this problem also involves the use of a holistic approach and the integration of the efforts of the entire psychological, pedagogical and medical community.

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现代政治话语中自我介绍传播战略实施中的性别问题（以 D. TRUMP 和 K. HARRIS 的演讲为例）

**GENDER ASPECT IN THE SELF-PRESENTATION COMMUNICATIVE STRATEGY IMPLEMENTATION IN THE MODERN POLITICAL DISCOURSE (ON THE EXAMPLE OF D. TRUMP'S AND K. HARRIS'S SPEECHES)**

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本文致力于分析现代政治话语中自我呈现交际策略实施中的性别方面。研究的相关性取决于对政治话语的兴趣增加，特别是在其交流和实用潜力方面。以 D. Trump 和 D. K. Harris 的演讲为例，作者设法比较了他们通过不同的演讲策略以及词汇和句法重复、平行、否定含义词汇、分词、对立和指示等语言手段来展示自我形象的方式。人称代词“我们”和“我”。

关键词：交际策略，自我呈现策略，政治话语，男性/女性言语行为，性别方面

**Abstract.** *The article is devoted to the analysis of gender aspect in the implementation of the self-presentation communicative strategy in the modern political discourse. The relevance of the research is determined by the increased interest in the political discourse, especially in terms of its communicative and pragmatic potential. On the example of D. Trump's and D. K. Harris's speeches the author managed to compare the way they demonstrate their self-image via different speech tactics and such language means as lexical and syntactic repetitions, parallelism, negative connotation vocabulary, parcelling, antithesis and deixis of the personal pronouns "we" and "I".*

**Keywords:** *communicative strategy, self-presentation strategy, political discourse, male / female speech behavior, gender aspect.*

In recent years, the number of studies of language features of the political discourse has significantly increased, which is quite understandable due to the active modern political processes and events – negotiations, elections, conflicts, dialogues and manipulations, which increasingly occupy all media landscape. At the same time, we can definitely observe hidden or sometimes quite explicit communicative

aggression in the speeches of political speakers [1]. As the main task of modern political discourse is to consider the distribution and legitimization of power through manipulation of public opinion, interiorization of political values, representation of social objects as mental and immanent, subjective meanings as objective categories, it explains the complexity and ambiguity of its language – the use of emotionally elevated vocabulary, semantic uncertainty, ideological polysemy, etc. [2].

In our opinion, the most productive way to study political communication not only from the point of view of its lexical specifics, but with the consideration of the communicative-pragmatic approach principles, as a strategic process that allows the addressee to implement specific communicative goals through the choice of particular language means. And from the numerous communicative strategies of modern English we find the strategy of self-presentation to be of sufficient scientific interest for political discourse studies. The main reason why political speakers often turn to this strategy is the necessity to create a positive image in the public eye through certain emotional personal presentation which could help to influence the listener.

We decided to distinguish specific pragmatic, lexical, syntactic and stylistic means that modern political speakers use to achieve the maximum effect and impress the audience. With this in mind, we sorted out different speeches of the most prominent representatives of modern English-speaking political establishment, both male and female, and chose two, in our opinion, the most prominent representatives - the former 45th US President Donald Trump and the new US Vice President Kamala Devi Harris. Thus, we set a goal – to consider gender aspect in the self-presentation communicative strategy in the modern political discourse.

As for Kamala Harris, we chose her first speech as the new Vice President of the United States. We can say that in general her speech behavior is often harsh and categorical, and during the election campaign she repeatedly showed clearly expressed communicative aggression towards D. Trump and his administration, not mincing her words. The Washington Post, which published her speech, accompanied it with such comments as “Kamala Harris, daughter of Jamaican and Indian immigrants, elected nation’s first female vice president”, “Americans react to Kamala Harris’s historic victory: Look baby, she looks like us” etc., manipulating their readers’ opinion beforehand through emphasizing the exclusiveness of the new Vice President [3].

The analysis of the pragmatic tools of the verbal level allowed us to identify the following components of the holistic public image that she cultivates through her self-presentation as the new Vice President: a democracy fighter, a devoted assistant, a defender of family values, a fighter for women’s rights, a groundbreaker and a hard worker.

Projecting the image of a “democracy fighter”, K. Harris uses the speech tactic

of referring to an authoritative opinion. She cites the Congressman John Lewis: *“Democracy is not a state. It is an act”*, and goes on to say that protecting it *“takes struggle”*, which in turn *“takes sacrifice”*, but *“there is joy in it”*. If we consider the vocabulary she uses, we should mention a great number of words and combinations related to the topic of struggle, e.g. *fight for, struggle, sacrifice, victory, challenging, courage, resilience, equality, liberty, justice, break barriers, combat, commander in chief, troops*, etc.

The image of a “devoted assistant” is presented by K. Harris through the use of the tactics of positive presentation of J. Biden and his family. She is generous with compliments to the new president, putting his name next to such concepts like “hope”, “unity”, “decency” and “truth” (*You chose hope and unity, decency, science and, yes, truth. You chose Joe Biden as the next president of the United States of America*), calling him a “healer”, a “uniter”, a “tested and steady hand”, a “person whose own experience of loss gives him a sense of purpose”, a “man with a big heart”. She does not forget to mention Biden’s affection to his family - his wife Jill, who, in her words, will be an “incredible first lady”, son Hunter, daughter Ashley, grandchildren and his deceased son (*Beau, my dear friend, who we remember here today*).

Presenting herself as a “defender of family values”, a wife, a mother, a sister and a daughter, K. Harris tries not just to demonstrate her gender identity once again, but also to show that family is no less important to her than to Joe Biden, and that she, like most ordinary Americans, values the institution of the family: *“And to my husband, Doug; our children, Cole and Ella; my sister, Maya; and our whole family - I love you all more than I can ever express”*. She still devotes special attention to her mother, deliberately emphasizing her non-white origin, which didn’t make any obstacles to her American dream: *“... my mother, Shyamala Gopalan Harris, who is always in our hearts. When she came here from India at the age of 19, she maybe didn’t quite imagine this moment. But she believed so deeply in an America where a moment like this is possible”*.

The image of a “fighter for women’s rights” is now extremely popular in the United States, so it is not surprising that the new Vice President positions herself this way. She uses the speech tactics of gratitude and addresses all the women, especially non-white, thanking them for paving her way: *“Black women, Asian, White, Latina, Native American women who throughout our nation’s history have paved the way for this moment tonight”*. She also expresses her appreciation of all the sacrifice they made and their struggle *“for equality, freedom and justice”*, of being the *“backbone of our democracy”*, winning the right to vote in a difficult long-term struggle and supporting her: *“And I stand on their shoulders”*.

It goes without saying that having become the first non-white woman to hold the post of Vice-President, K. Harris could not but present oneself as a “ground-

breaker”: *“I may be the first woman in this office”*. She tries to demonstrate that her own achievements open up new opportunities for all US citizens: *“... every little girl watching tonight sees that this is a country of possibilities”*.

An important message to the audience was the idea that the new administration will have to work very hard to correct all the mistakes of the previous president and his team. Thus, using the tactics of setting tasks which she and the entire Biden administration need to fulfill, K. Harris cultivates her image of a “hard worker” who will do her best: *“I will strive to be a vice president ... the real work begins. The hard work. The necessary work. The good work”*. At the same time, setting such ambitious goals like “to save lives and beat this pandemic”, “to rebuild our economy so it works for working people”, “to root out systemic racism in our justice system and society”, “to fight the climate crisis” and “to unite our country and heal the soul of our nation”, she deliberately emphasizes that there is such an extensive scope of work for the new administration exists only due to the fact that the previous one was unable to solve very important problems.

To analyze the speech behavior of Donald Trump we chose his public address at the final debate with Joe Biden. In the close of that vivid political duel the host of the NBC News channel invited the candidates within one minute to say what they, in case of the victory, would say to the Americans who voted against them on the inauguration day [4]. It is quite obvious that under such circumstances the candidates would turn to the strategy of self-presentation.

As a result of the analysis of D. Trump’s speech, we were able to find some specific language means of implementing the communicative strategy under study.

As one of the most obvious verbal tools of self-presentation, Trump uses lexical repetition to create and consolidate the image of a “successful candidate” by means of such words and word combinations like “success”, “successful”, “the best numbers”, etc.: *“We have to make our country totally successful”*; *“Success is going to bring us together”*; *“We are on the road to success”*; *“We had the best Black unemployment numbers in the history of our country, Hispanic, women, Asian, people with diplomas, with no diplomas, MIT graduates, number one in the class - everybody had the best numbers”*.

Donald Trump implements the strategy of self-presentation using vocabulary with negative emotional connotation which helps him not just to praise his own advantages and merits, but at the same time contrast them to the “sins” and shortcomings of his opponent: *“And he wants to put new regulations on everything. He will kill it. If he gets in, you will have a depression, the likes of which you’ve never seen. Your 401K’s will go to hell and it’ll be a very, very sad day for this country”*.

Using antithesis for contrasting his achievements with the actions of Joe Biden is one of D. Trump’s favorite techniques, which he could not do without in the election debates: *“But I’m cutting taxes and he wants to raise everybody’s taxes.*

*And he wants to put new regulations on everything”.*

One more specific feature we managed to find is the personal deixis of the pronouns “we” and “I” in D. Trump’s final speech. He tends to use the personal pronoun “we” as “we- inclusive”, which includes both the listener and the speaker. By saying “we”, D. Trump implies: himself and his team: “*Now we’re rebuilding it and we’re doing record numbers ...*”; himself and his fellow party members: “*We have to make our country totally successful, as it was prior to the plague coming in from China*”; himself and all US citizens: “*We are on the road to success*”. But he does not forget from time to time to demonstrate his own status and importance in solving problems of national importance, using the personal pronoun “I” as the subject: “*But, I will tell you, go back before the plague came in, just before, I was getting calls from people that were not normally people that would call me*”.

Thus, we considered the use of the strategy of self-presentation in the speech of K. Harris and identified the following communicative and pragmatic tools typical for female speech behavior in the modern English-language political discourse: gender identity, representing own political image as a combination of popular social concepts (such as a democracy fighter, a devoted assistant, a defender of family values, a fighter for women’s rights, a groundbreaker and a hard worker); use of speech tactics of referring to an authoritative opinion, of positive presentation (of the boss), of gratitude and of setting tasks; harsh categorical statements and active use of vocabulary related to the topic of struggle. However, male speech behavior in the self-presentation strategy implementation in the political discourse can include such pragmatic means like lexical repetition, vocabulary with negative emotional connotation to make the opponent’s image negative, antithesis and personal deixis of pronouns “we” and “I”.

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POSHEKHONYE的歌曲  
SONGS OF POSHEKHONYE

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2000 年和 2001 年, 提交人前往雅罗斯拉夫尔州及其周边地区的 Poshekhonye。这些旅行以当地人口中最有趣的人种学材料的大量实地记录为荣。记录了: 传统医学的食谱, 日历和家庭和家庭仪式, 儿童的民间传说..... 在众多的民间艺术流派中, 歌曲保存完好: 四首歌曲, 抒情歌曲, 历史歌曲, 监狱歌曲, 新兵歌曲, 民谣歌曲, 小曲 等等..... 在这份报告中, 作者提供了一些 2001 年在波舍霍耶市录制的歌曲民俗样本, 来自 1932 年出生的波舍霍耶土生土长的 Ekaterina Ivanovna Gavrilova。

关键词: Poshekhonye 民俗、歌曲

**Abstract.** *In 2000, 2001 the author undertook trips to Poshekhonye in Yaroslavl region and its environs. The trips were crowned with numerous field recordings of the most interesting ethnographic material that exists among the local population. There were recorded: recipes of traditional medicine, calendar and family and household rituals, children's folklore... Among the numerous genres of folk art, songs are well preserved: quadrille, lyric, historical, prison, recruit, ballad-type songs, ditties, etc... In this report, the author offers for publication some samples of song folklore recorded in the city of Poshekhonye in 2001 from Ekaterina Ivanovna Gavrilova, born in 1932, a native of Poshekhonye.*

**Keywords:** *Folklore of Poshekhonye, songs.*

In 2000, the author with the folklorist Yu. I. Smirnov, who was then working at Gorky Institute of World Literature (RAS), went to a conference in the city of Poshekhonye, Yaroslavl region. After reading our reports, in our free time from lectures, Yuri Ivanovich and I, with the support and organization of the trial by Tamara Viktorovna Kudryavtseva (GIWL employee, native of Poshekhonye), decided to collect folklore material from residents of the city and nearby villages. Then, in 2001, the author undertook another trip to continue collecting ethnographic

material. Among the numerous recorded genres, songs are well preserved: quadrille dance, lingering lyric, ditties, recruits, prison... Some examples of folk songs, the author presents in his report. I would like to especially note the remarkable storyteller and songwriter Ekaterina Ivanovna Gavrilova, born in 1932, from whom a huge amount of material was recorded. This article consists entirely of songs recorded by the author from E.I. Gavrilova in 2001. (Music notation Zaporozhets V.V.).



Handwritten musical score for a quadrille song. The score is in G major (one sharp) and 3/4 time. It consists of two systems of music. The first system has a tempo of quarter note = 80 and a second part with quarter note = 100. The second system has a tempo of quarter note = 80. The lyrics are:

1. За-пря-чу я ко-ня (6) зрю-ю зо-ло-ту - ю,  
И по-е-ду вре кра-я по-ви-дать ми-лѹ - ю.

2. И по-е-ду вте кра-я по-ви-дать ми-лѹ - ю:  
"Зра-ва-вай, ми-ла-я мо-я, как ты по-мни-ва - ёшь?"

Транспонировано на 1 тон вверх.

**Quadrille.**

1. I will put the horse in a golden harness  
I will put the horse in a golden harness  
And will go to those parts to see my dear.
2. And will go to those parts to see my dear.  
"Hello my dear, how are you?"
3. Hello my dear, how are you?  
Often-or-rarely do you remember me, joy?
4. Often-or-rarely do you remember?"  
"Remember you I cannot — people judge me.
5. Remember you I cannot — people judge me.  
People judge me, parents scold me!"

♩ = 56

1. На ве - се - лу - ю го - ли - ну  
 Да лет не - та - льной свет лу - на  
 Я слы - шу го - лос от ро - дно - ва  
 Ве - се - лу не - сню я - мици - ка.

2. Ве - се - лу не - сню я - мици - ка  
 А бе - ла гу - ле - ныка по - рка - ет,  
 Ле - тя к дру - го - тку сво - е - му.

Далее напев исполняется по 2<sup>й</sup> строфе (кроме 5<sup>й</sup> строфы, которая исполняется по 1<sup>й</sup> строфе).

**Lyrical.**

1. On the merry valley/The moon shines with sad light,  
 I hear a voice — from my dear/Cheerful song of the coachman.
2. Cheerful song of the coachman.  
 And a white dove flutters,/Flying to her friend.
3. Flying to her friend.  
 And a sweet girl sighing/Sits in a high tower.
4. Sits in a high tower.  
 She will sigh, and sighs are heavy,/Tears are rolling from her eyes.
5. Tears are rolling from her eyes.

Roll a tear, roll a bitter one,/Roll on a white face.

6. Roll on a white face.

I will take out a little white handkerchief/I will wipe my lovely eyes.

7. I will wipe my lovely eyes.

With my timid voice/I will sing a joyful song.

8. I will sing a joyful song.

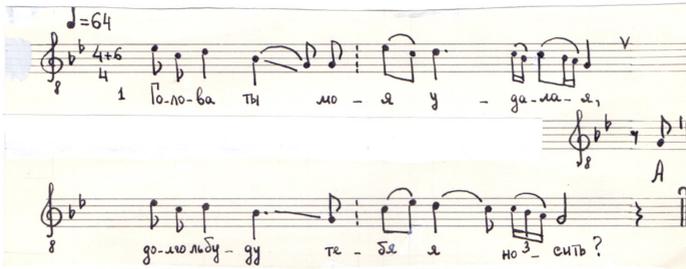
Where did my dear friend disappear,/Where did my dear fly?

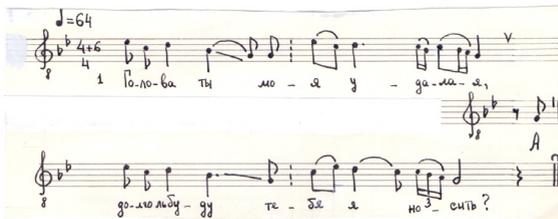
9. Where did my dear fly?

I went to the far lands,/Did not send news.

10. Did not send news.

On the merry valley/The moon shines with sad light





**Prison.**

1. My daring head,/How long will I bear you?
  2. How long will I bear you?
- Ah, my deathly fate,/How long will you torment me?
3. How long will you torment me?
- And why was I born,/And why did my mother give birth to me?
4. And why did my mother give birth to me?
- Just so I could wander around the world/And experience prison life.
5. And experience prison life.
- How long did I sit in this cage/Never saw anyone.
6. Never saw anyone.
- Only wicked, melancholy and grief/Has drained me, a fine fellow.
7. Has drained me, a fine fellow.
- Has drained me, broke me/And drove me to the grave.
8. And drove me to the grave.
- Where did my fair curls go?/Where has my beauty gone?
9. Where has my beauty gone?
- The ruddy cheeks turned pale,/Cheerful eyes clouded.
10. Cheerful eyes clouded.
- I will die in a prison bed,/They will bury me sloppily.
11. They will bury me sloppily.
- And no one will know about me,/And my dear mother will not cry.

12. And my dear mother will not cry.  
 You fly little birds/To my unfortunate grave.  
 To my unfortunate grave  
 You sing a sad song,/About my unfortunate fate.



**Recruiting.**

1. We had three brothers in our family/A happy family it was  
 And we all worked together/And never grieved.
2. One fine evening/The agenda came from the volost,  
 And in that agenda it was announced/One should come and be a soldiers.
3. Here is the eldest son – with wife and children/He cannot go to serve,  
 And the youngest son is way too green,/So let him spend time with the girls.
4. And the middle brother was sitting on a chair./He shed bitter tears  
 And he went out on the porch./He called his friends-comrades.
5. The last day has come,/I walk with you, friends,  
 And tomorrow early at dawn/All my family will cry.
6. My brothers, sisters will cry/Mother and my father will cry.  
 My dear will also cry,/With whom I lived for three years.
7. I thought to marry her,/Promised to love her to the grave.  
 The carriage rolled up to the house/Wheels knocking on the ground.
8. From the carriage the superiors cried out:"Prepare your son!"  
 The peasant's son has long been ready,/The whole family lies, as if dead.
9. And the carriage rolled/Along the pole track,  
 Now mother won't say:/That: "Get up, wake up, dear son!"  
*He left for the army.*

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G. YAKHINA 的《我的孩子们》作为一部历史小说通过词汇和语义领域的棱镜 «德语»

**«MY CHILDREN» BY G. YAKHINA AS A HISTORICAL NOVEL  
THROUGH THE PRISM OF THE LEXICAL AND SEMANTIC FIELD  
«GERMAN»**

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文章从词汇语义场“德语”的功能角度考察古泽里·亚希娜的小说《我的孩子们》，从中可以看出作者对“德”主题体现手法的多样性。小说。这项研究使得在领先的词汇语义场系统中识别出一些微场成为可能：英雄的专有名词、地名、日耳曼语等。材料的概括使我们能够确定作者在历史主题，其体现的不寻常，作品的语言完美。

关键词：当代俄罗斯文学，G. Yakhina，小说《我的孩子们》，词汇语义场

**Abstract.** *The article examines the novel by Guzeli Yakhina "My Children" from the point of view of the functioning of the lexical-semantic field "German", which makes it possible to see the diversity of the author's approaches to the embodiment of the theme of the novel. This study made it possible to identify a number of microfields in the system of the leading lexico-semantic field: proper names of heroes, geographical names, Germanisms, etc. Generalization of the material allows us to determine the deep awareness of the author in the historical topic, the unusualness of its embodiment, the linguistic perfection of the work.*

**Keywords:** *contemporary Russian literature, G. Yakhina, the novel "My Children", the lexico-semantic field.*

One of the most significant systems in modern linguistics is the lexical-semantic field. A huge number of definitions and interpretations of the concept of "lexical-semantic field", in principle, boils down to understanding it as an association of a group of words that, "despite structural differences, are based on this or that semantic category or categorical situation" [1, p. 126]. Researchers note that the structuring of lexemes in the analysis of a literary text allows a deeper understanding of the concept of the work, to assess the style of the author [2-5]. In a literary work, the construction of the lexical-semantic field and the identification

of microfields help to establish a logical connection between parts of the text, the logic of the plot, and the peculiarities of the implementation of its idea.

"My Children" (2018) by G. Yakhina is a novel by a modern writer dedicated to the dramatic page in the history of the Volga Germans in Russia at the turn of the epochs. We believe that looking at a work through the lexical-semantic field "German" will help to reveal many facets of the novel, which are clearly visible only with this approach to the study of a literary text.

The stream of reviews about G. Yakhina's novel "My Children" defines many aspects worthy of close attention of critics and readers [6-10]. This article will focus on how the author recreates the world of Russian Germans unknown to many. The analysis of the lexical-semantic field "German" and its microfields helps to do this.

Reading the text of the work made it possible to identify more than 200 lexical items related to the lexico-semantic field "German". It is especially important that the frequency of their use varies in different parts of the book.

According to our observations, the microfield "proper names" has become the most used in the lexical-semantic field "German". Linguist V.A. Nikonov believes: "The name of a character is one of the means that create an artistic image, it can characterize the social belonging of a character, convey national and local flavor, and if the action takes place in the past, then recreate the historical truth (or destroy it, if the name was chosen contrary to the truth)" [11, p. 234]. The significance of the name of the characters in a literary work is noted in the works of V.V. Vinogradova [12], A.V. Superanskaya [13], S.I. Zinin [14] and many others. At the beginning of the novel G. Yakhina introduces the main character - the teacher Jacob Ivanovich Bach. The combination of his name and patronymic implies some kind of duality, the Russian-German essence not only of his fate, but of all immigrants from Germany and their numerous descendants, for whom Russia became their homeland. Acquaintance with Bach's fellow countrymen fills the "proper name" microfield: Pastor Adam Handel, widow Koch, fat woman Amy Böll, pig-breeder Gauf, grandmother Fischer, carpenter Schroeder, family Dürer, worker Kohl, weaver Diesel, ingratiating Gauss, head Peter Dietrich, miller Julius Wagner, artist Anton Fromm, blacksmith Benz. As the plot develops, Jacob Bach's "inner circle" includes Udo Grimm - the father of the teacher's future wife, her nanny Tilda, as well as the hunchback Hoffmann, who arrived in a German settlement to build a new life, and along with him the editors Wundt and Fichte are mentioned, chairman of the party committee Becker. Note that almost all surnames are well known in Russia, they are associated with their more famous carriers: writers, philosophers, politicians, scientists, artists, musicians who glorified Germany, like the name of the protagonist. Why does the author choose these sonorous surnames for his most ordinary characters? There can be a great variety of answers. For

example, researcher V.N. Mikhailov notes: "The use of the name bears the stamp of a certain era, literary trend, class position of the author. One and the same name can serve different purposes"[15, p. 54]. Perhaps, in the work of G. Yakhina "My Children" this way emphasizes the idea of the unclaimed potential of Russian Germans in Russia at the beginning of the XX century, whose "loud" names remind of the best representatives of the German people and their world-class achievements.

An important component of this microfield is the names of the true geniuses of German culture and literature. Bach, as a teacher, was directly connected with them. "The only subject when a thought regained its former freshness and vigor was German speech. Bach did not like to delve into calligraphy, hastily strived the lesson towards the poetic part: Novalis, Schiller, Heine - poems poured on young shaggy heads generously, like water on a bath day"[16, p. 19]. This list is continued by Lessing, Gottshed, the brothers Grimm, Goethe. The reality and significance of this list of proper names are conveyed through the inclusion in it of the names of Volner - the author of "Russian speech", Goldenberg - the author of a problem book on mathematics, which was always in Bach's hands during the lesson.

German proper names, at the same time, in this microfield also carry a significant ideological load, create a historical context in the work, and bring drama. They appear in chronological order, lined up in accordance with the logic of the historical process of the XX century: Karl Marx, Friedrich Engels, Karl Liebknecht, Rosa Luxemburg. In the scene of the "Gnadental revolt", a generalizing assessment is given. "Books are out of abundance! Posters from the school and a propaganda corner! Magazines and newspapers! - continued to shout Benz. - Portraits of all these canine sons and daughters, whom God for some reason awarded with German names! Paper rolls, stacks of books flew into the fire, then - one after another - massive painted frames with photographs: from Karl Marx to Karl Liebknecht" [16, p. 303]. This list of historical figures, who fatally influenced the fate of millions of people and largely determined the attitude towards the Russian Germans, is continued by Paul von Hindenburg, Joachim von Ribbentrop, Rudolf Hess, Adolf Hitler. G. Yakhina introduces these German proper names into his work as certain temporal and historical landmarks, which make it possible to relate the life of the heroes of the novel to a great historical time.

In the analyzed microfield, an interesting author's technique can be called the use of a proper name in the plural, and sometimes writing it with a small letter. These spelling violations are fully justified in terms of the theme and idea of the novel. For example, the chapter "Wife" contains an assessment of V.I. Lenin, given by his followers: "Someone in the Politburo believed that the leader was killed by the Germans. All these försters, clemperers, nonke, borchardts, strumplers, bumke are a zapoloshny croaking flock that flew in from Germany" [16, p.

129]. In the chapter "Daughter" there is another example: "People walked next to the wagons: cheerful Manns, stingy Langs, God-fearing Wenders, hardworking Grasses" [16, p. 213]. The chapter "The Apprentice" describes a new generation of future builders of a happy life: "Round-cheeked kids, surprisingly born in the most hungry and troubled years of the German Republic - little Lenche, Amalche, Hanselche and Gretche - sat on low benches around the porch and listened to the words, which a couple of nights ago came out from under the hand of Bach"[16, p. 256]. In this form of writing proper names, one can see the depersonalization of "tens of Khans and Peter" [16, p. 132] in the eyes of the mighty of this world. On the other hand, the plural form, which is unusual for proper nouns, creates a feeling of replication and mass character. These are not individual concrete personalities, but a whole people with their own language and traditions, which were once torn off from their roots, but did not find them on Russian soil, becoming an integral part of the history of Russia.

The original subsystem of this microfield can be considered the names that came from German folklore, which literally permeates the entire novel. These are "stupid Hans", "Pied Piper of Hamelin", "Osling giant". They are organically woven into the text of the work, becoming bright allusions and metaphors.

The next significant microfield of the lexical-semantic field "German" in the novel "My Children" are geographical and administrative names. The main lexeme, of course, in this microfield is the word "Germany" and many derivatives formed from it. Kaiser's Germany, Weimar Germany, imperial Germany - all these phrases reflect the rapidly changing image of the European power, its political system. However, the two phrases have, rather, a metaphorical meaning: Volga Germany ("Then Volga "Germany" was defined a more modest, although still worthy role: to become, if not an instrument of building communism, but its agitational showcase" [16, p. 133]) and tame Germany ("With his own hands he created a German commune on the banks of the Volga - a kind of small tame Germany, directly subordinate to the government in Moscow" [16, p. 133]).

The names of the Volga colonies make up a broader group of lexemes of this microfield. Their analysis allows us to reveal an obvious dilemma of these lexemes according to the principle "here - there" in Russia and Germany. "The colonists brought their languages in the middle of the eighteenth century from a distant historical homeland - from Westphalia and Saxony, Bavaria, Tyrol and Württemberg, Alsace and Lorraine, Baden and Hesse" [16, p. 20]. The image of distant Germany appears in the names of German lands, which were never seen by the Volga Germans living in the twentieth century, in the mentions of the rivers: Rhine, Spree, Oder, Elbe, Weser, Main, Ruhr. These realities of the German lands live in the national memory of the Volga Germans, shrouded in an idyllic haze and from this become more beautiful, desirable, but unattainable. Obviously, in an effort

to preserve this memory for posterity, to root their national identity, the German colonists gave their settlements sonorous names, many of which repeat the names of German cities and villages. So, the Volga Gnadental, where the events of the novel unfold, even with its architecture resembles the Saxon Gnadental, located on the banks of the Elbe. The names of the Volga colonies: Balzer, Kutter, Messer, Schilling, Schwab, Zurich, Basel, Schenchen, Zug, Glarus, Urbach, Straub, Unterdorf, Kuknus - retained the names of the first settlers, founders of settlements, or brought the names of German cities into Russian toponymy.

Another interesting component of the lexical-semantic field "German" is the actual German words, partly included in the Russian language as barbarisms, or rather Germanisms [17, 18], partly remaining only an example of German-language vocabulary, which sounds very harmoniously in the novel "My Children": Schulmeister, Schulhaus, Kircha, Frohlein, Schwank, Klomps, Ledger, Landgrave, Reich, Reichsmark, Fuhrer. In the work, these lexemes, on the one hand, help to create the atmosphere of Gnadental and similar German colonies, preserving their linguistic and cultural identity. On the other hand, they once again emphasize the tragedy of the fate of the colonists, whose peaceful life was crossed out by the Fuhrer, who wished to elevate his Reich to the status of a superpower. There are also unusual phrases in this microfield. For example, in a note written by Bach on the worldview of the colonists, we read that "for more than a hundred years, the Russian Germans, without noticing it, turned into a people different from the Reichsdeutsch people" [16, p. 190]. The distinction between "Reichsdeutsche" and "Volksdeutsche" was relevant only for the Germans of the twentieth century. In the minds of Jacob Bach, who was far from the political strategies of the Nazis, the "Reichsdochs" meant the Germans of Germany, who were not at all like the colonists of the Volga region. This lexeme in the novel is associated with the bitter reflections of the protagonist of the work about the bitter share that fell to his relatives: "So isn't it time for us, Russian Germans, to understand that distant happiness does not exist?" [16, p. 191] The concept of "volsdeutsche" is actualized in connection with the Nazi policy of fascist Germany and will only sound in a new context at the end of the novel.

Lexemes that come from the German language and are written in German are adjacent to this microfield. There are not many of them in the text, but they are necessary as a kind of document, a kind of national and cultural sign of the era. These are numerous names of German newspapers, political organizations, as well as words from songs, proverbs, etc.

The analysis of the lexical-semantic field "German" in G. Yakhina's novel "My Children" is impossible without the lexeme "German" itself, which occurs quite often in the text, but at the same time brings a lot of metaphorical meanings into the work. It is important to note the changing emotional coloring of these words

and phrases from chapter to chapter. At the beginning of the novel, the pre-revolutionary life of the Volga colonies is calm and full-flowing, like the Volga. On behalf of Jacob Bach, the traditional concepts for the worldview of immigrants sound: German, high German, literary German, German speech, German princess (as the colonists called Catherine II), German doctors, Russian Germans, German accuracy. The revolution of 1917 abruptly changed the life of the Volga colonies. These changes were reflected in new phrases: the German commune, the German working people, the German Socialist Republic. As the Soviet regime, in the context of the aggravation of political relations with Germany, changes its attitude towards immigrants, the words denoting everyday life and customs are reduced, become deliberately rude: German commune, non-republic, German film, German kurkuli, nemchura. The final chord of this falling gradation in the assessment and perception of the colonists will be Stalin's reflections on them: "Germany has been preparing for war, has been preparing for a long time. In its rich arsenal, among others, there was an untested, but serious weapon: ethnic Germans - a herd of Trojan horses scattered across the globe and waiting in the wings. Hitler - a madman, hysterical and undoubted demagogic genius - during his many hours of speeches fell into oratorical ecstasy, telling about the unfair attitude of other states towards the "most faithful sons of the Aryan nation" living on their territories. He longed for these sons to stand under the banner of the Reich: he proclaimed the beginning of the struggle for the creation of Nazi Germany abroad and introduced the concept of "absolute German", which automatically turned anyone in whom the noble Aryan blood flowed into a Nazi, for "blood is stronger than a passport" [16, p. 457]. It should be noted that the lexemes of this microfield are more saturated with the first and last chapters of the novel, as two polar points of view reflecting opposite views on the German colonists in Russia.

In general, a look at G. Yakhina's novel "My Children" through the prism of the lexico-semantic field "German" allows you to see in relief the large-scale historical and cultural material of the work, to appreciate the subtle style of the text, the skill of the writer. It is quite logical that proper names have become a more voluminous microfield, since the tragedy of the fate of the Volga Germans is manifested in the life lines of individual people - the heroes of the novel. The capacity of the lexical and semantic field of the novel "My Children" gives it authenticity and persuasiveness, which is very important for any work of historical subjects.

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企业网站开发（设计-工程）的特点和问题  
**FEATURES AND PROBLEMS OF CORPORATE WEBSITE  
DEVELOPMENT (DESIGN-ENGINEERING)**

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本文讨论了企业网站作为一种独特工具的功能和信息能力，能够解决组织面临的许多问题。分析了企业网站发展的主要特点和问题。考虑了企业网站设计的主要阶段，突出了每个设计阶段出现的关键特征和困难。

关键词：企业网站、商业组织、设计、工程、平面设计、图形元素、设计、概念、正式构图

**Abstract.** *This article discusses the role of a corporate website as a unique tool in terms of its functional and informational capabilities, capable of solving many problems facing an organization. Analyzed the main features and problems of the development of corporate sites. The main stages of the design of corporate sites are considered, the key features and difficulties that arise at each of the stages of design are highlighted.*

**Keywords:** *corporate website, commercial organization, design, engineering, graphic design, graphic elements, design, concept, formal-figurative composition.*

The modern Internet space in the XXI century is a special, unique, progressive and actively updated information environment, which opens up vast prospects for both commercial organizations, corporations and government agencies in need of wide information coverage [3, p.118].

It is for this reason that the development of your own corporate website for organizations of any profile in the prevailing conditions is the formation of a tool that is unique in its functional and informational capabilities, capable of solving many problems facing an organization - from its popularization in the consumer environment, increasing the competitiveness of the organization in a certain local market, facilitating the work of the organization's employees, until a certain image of the organization is formed both in the eyes of buyers and potential consumers of

services and products that this organization provides, and in the eyes of business partners [9, p.211].

The design of corporate sites, therefore, is a unique and highly demanded service in the modern information market in the business environment [10, p.101]. The development and design of a corporate website has a number of specific features and a number of problems that often arise in the process of work at each of its stages [7, p.34]. It is necessary to analyze the stages of the design of a corporate website, as well as its key features and problems that arise in the process of working on each of the stages of design, in more detail.

Conventionally, the process of design-engineering of a corporate website of an organization can be divided into the following main stages:

1. Stage of pre-project analysis. This stage is one of the fundamental, key points in the process of design-engineering of the corporate website of the organization, since the success and effectiveness of all the main stages of the development of a corporate website will depend on the results of its completion in the future [5].

The stage of pre-project analysis, therefore, is the stage at which a systematic integrated approach of the design-design process is implemented, which includes a thorough analysis of the information received about the organization for which the corporate website is being designed, its target audience, the key needs of the organization and the target audience, as well as analytics of the theoretical foundations of the process of designing a corporate website of organizations of a similar profile, which is necessary for the process of creating a basic formal-figurative composition, the fundamental concept of the final design concept [8, p.362].

It should be noted that one of the most common, common problems-errors that can be encountered at this stage of the design process of the corporate website of an organization is that effective activities to form the final design concept, the concept of a corporate website should be based only on theoretical comprehension. the basics of the process of designing a corporate website for organizations of a similar profile, but not in any way on the practical use, "borrowing" of certain graphic elements from other corporate sites [4, p.437].

This is due to the fact that such a design decision can hardly be considered correct, since only unique graphic objects combined into a single semantic concept, into a single formal-figurative composition, will be the key to developing an effective final graphic product that serves a specific set of needs of a particular company. needing to develop a corporate website.

Thus, the stage of pre-design analysis, which is a systematic integrated approach to the design-design process, includes a thorough analysis of the following factors underlying the formation of the concept of a corporate website for a particular organization:

– the key needs of the organization, which it pursues by creating its own cor-

porate website,

- key needs of the target audience of the organization (Clausura);
- analytics and careful analysis of the information received [2, p.64].

The main goal of the pre-project analysis stage is to find effective ways to solve the problems and tasks facing the organization, which it is possible to solve for itself by creating its own corporate website. Therefore, the key task of the pre-project analysis stage is a thorough and comprehensive study of the design-design object in accordance with its existing needs, problems and needs.

The stage of pre-project analysis in the process of designing a corporate website is also one of the key ones for the reason that through the analysis of the information received, it is already possible at this stage to determine the basic, basic graphic solutions for the formation of the concept of corporate graphics, the colors and fonts used.

The stage of pre-project analysis, which is a preparatory stage for the next stage - the stage of forming the concept of a corporate website - allows you to determine the main elements of this concept using such an effective tool for visualizing the concept and its fundamental ideas as a clausura.

Clausura is a formal-figurative composition that allows you to visually reflect those plastic, font, graphic and color solutions that will form the basis of the concept of a corporate website of a particular organization, to check the "correctness", the harmony of their relationships [6].

The purpose of the clausura, therefore, is not only to find a general graphic idea for a corporate website design project, but also to check it later. One of the key features of checking the effectiveness of such a formal-figurative composition at the stage of pre-project analysis is that it can be presented to a focus group in order to identify associations, thoughts and emotions that it evokes - the more positive feedbacks close to the main idea and concept. the focus group has a clausura, the higher the likelihood that the developed formal-figurative composition of the corporate website of a particular organization is effective, correct and as close as possible to the technical task facing the designer.

2. The next stage is the formation of the concept of the corporate website of the organization, which is based on the terms of reference, data obtained at the stage of pre-project analysis, the most effective clausura and its graphic and design solutions. Formation of the concept of a corporate website is also one of the important stages in the design process.

The most effective results at this stage can be achieved if the concept is presented in maximum detail in text form, and in the process of developing the fundamental graphic and design solutions, its author will strictly follow not only the customer's technical specifications, but also the concept itself.

Thus, the concept contains not only those goals and objectives that are set by

the customer and are contained in the terms of reference, but also the rationale for the visual, graphic, font, plastic solutions developed and implemented in corporate graphics.

It is for this reason that the stage of forming the concept of the corporate website of the organization seems to be extremely important, since the effectiveness of the final graphic product - the corporate website, as well as how successfully it will solve the tasks set for it initially, will depend on the success of its implementation stage of pre-project analysis.

3. The next stage in the process of developing a corporate website is the design-design stage itself. At this stage, the development of those key graphic constants that will form the basis of the concept of the corporate website of a specific organization formed earlier, at the previous stage, is taking place.

The basis of this stage includes the following design design processes - visualization of the idea, the concept of the corporate site of the organization, the development of key graphic elements of the corporate site.

Before embarking on the process of visualizing the final graphic solutions that will form the basis of the concept of a corporate website, it is necessary to select five adjectives that will make it possible to characterize as clearly as possible the data about the organization, its key needs and features, about the target audience of the future corporate website, which were obtained on stage of pre-project analysis.

Further, when adjectives are defined, on their basis, a clear, final formal-figurative general composition is formed. Sometimes at this stage of design, it has already been formed in the process of pre-project analysis and tested in a focus group. Nevertheless, if a formal-figurative composition has not yet been formed, a certain sequence is necessary in the process of its creation - first graphic solutions, then color ones.

Violation of the sequence is also one of the typical mistakes in design design, since on the basis of certain graphic solutions it is much easier to work with the input of a certain color scheme: first, the search for the final formal-shaped composition in its graphic representation - line, tone, is carried out, which makes it possible to determine the character and plastic, and only then there is the introduction of certain color combinations into the selected graphic representation of the formal-shaped composition, the introduction of color into the tonal composition and the selected plastic.

4. The final stage in the process of design-engineering of the corporate website of the organization is the testing stage. It also tests the most formal-figurative composition (clausura) on the final target audience, and technical testing of the graphic elements of the finished corporate website (loading speed of graphic elements, positive or negative dynamics of perception of the graphic design of navigation and sitemap).

According to experts, a good result for a clausura that fully reflects the successful completion of the technical assignment for creating the final graphic product, and the effectiveness of its subsequent work for the benefit of the organization for which the corporate website was developed, is 60-70% of positive responses from the target audience [1, p. 54-56], which revealed exactly those associations that were originally incorporated into the clausura by the technical task and the tasks that face the corporate website as a tool aimed at solving certain problems and difficulties in the activities of the organization.

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用户界面中的黄色作为注意力管理工具  
**YELLOW COLOR IN THE USER INTERFACE AS AN ATTENTION  
MANAGEMENT TOOL**

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颜色是一个重要的设计元素。由于其性质的特殊性，不同的人非常主观地感知一种颜色，并且能够唤起广泛的情感。颜色感知取决于多种原因，包括个人喜好和文化背景，但黄色可以说是最通用的颜色之一。文章讨论了黄色对人影响的特点，以及它在界面设计中的使用特点、例子和建议。

关键词：平面设计，黄色，界面设计，图形用户界面，色彩理论，设计。

**Abstract.** *Color is an important design element. Due to the peculiarities of its nature, one color is perceived by different people very subjectively and is capable of evoking a wide range of emotions. Color perception depends on a number of reasons, including personal preference and cultural background, but yellow is arguably one of the most versatile colors. The article discusses the features of the influence of yellow on a person, as well as features, examples and suggestions for its use in interface design.*

**Keywords:** *graphic design, yellow color, interface design, graphical user interface, color theory, design.*

Color is the property of material objects to emit and reflect light waves of a certain part of the spectrum. Human perception of color is very subjective and depends not only on physiological and cultural characteristics, but also on past experience, psychological state and personal preferences. At the same time, color is a very fast non-verbal way of conveying information. Since color can influence a person's behavior, desires and emotions, the study and application of color theory is an important aspect of a designer's work. In interface design, color is used to influence perception and control user behavior, and to increase the convenience and speed of communication. When designing an interface design, it is important to

take into account the target audience of the product, including due to the cultural characteristics of color perception, since in different countries one color can have diametrically opposite meanings.

Yellow is the lightest and brightest color, and in almost all cultures it is associated with sun and gold. In ancient China, only members of the Imperial family had the right to wear yellow clothes. Yellow was a symbol of land and fertility, and had strong cultural and historical significance. On the other hand, among some peoples of Asia and in Egypt, yellow is the color of mourning and sorrow, and in India it is identified with trade, luck and deals. In Japan, it is the color of grace and grace. In Western culture, yellow is gender neutral and has conflicting meanings - it can mean both light, happiness, gold, knowledge and wisdom, as well as betrayal, duplicity and jealousy.

Around the world, yellow began to be used to attract attention and warn of the need for caution by the middle of the XX century. Despite the fact that different countries had their own prerequisites for the use of exactly yellow as a signal color, at the moment almost every person, regardless of country of residence, perceives yellow in this particular context. For example, a yellow traffic light warns the driver to start or stop driving. Tellingly, in the days before the widespread use of electricity for a warning signal, a signal light was used, which, due to its nature, has both a red, "dangerous" hue, and yellow - clearly distinguishable in the dark at long distances.

The physiology of the perception of yellow gives an understanding of its choice as a signal. When the reflected light hits the eye, color vision receptors send signals to the brain. Light waves of different lengths stimulate certain combinations of receptors, which allows a person to distinguish colors. The receptors responsible for red and green colors are especially sensitive to light. This process is well illustrated by the work of RGB matrices, where each cell, pixel, consists of three colored elements - red, green and blue. It is the work of the red and green elements that transfers the yellow color to the screen, which can be seen when examining the monitor or TV screen under a magnifying glass.

Any color is a wave of a certain length. Since yellow is not a pure spectral color, but, as indicated above, consists of two types of waves, the number of signals supplied to the brain is twice as large. Due to this feature, yellow reduces the sensitivity of receptors to blue and violet colors, so yellow appears to be the brightest color in the spectrum. Thus, the combination of the brightest color and the complete absence of reflected light - yellow and black colors, respectively, ensures maximum readability of the text at any time of the day, it does not matter which color is the background.

At the moment, yellow is used everywhere as a signal color:

- yellow traffic light

- protective tape
- road markings
- warning signs
- warning cones on wet floors
- construction equipment and many tools, as well as helmets
- school buses
- tanks with water on dangerous sections of the road
- checkers taxi
- reflective vests of builders, police officers, rescuers and other employees of various services
- signal lights on large vehicles or vehicles carrying dangerous goods

In 1939, at a conference at Columbia University (USA), in addition to other national standards, based on research, yellow was adopted as the standard for school buses. Since then, this standard has not changed, as it has proven its reliability in practice - according to the National Highway Traffic Safety Administration (NHTSA), yellow school buses are 70% safer than other vehicles. Subsequently, thanks to good statistics, the use of yellow for painting school buses was adopted in many countries.

Also in the United States, yellow markings are applied on dangerous sections of the road to restrict oncoming traffic flows, notifying drivers of a possible danger when driving into the oncoming lane. The local police are actively using the yellow restrictive tape, which warns about the ban on passage to the territory limited by it. Even for residents of other countries, these features are well known thanks to cinema and other elements of pop culture, and the famous New York yellow taxi even instilled certain associations in a Russian person, and therefore it is not surprising that the country's largest company providing transportation services uses in its design is exactly yellow.

In Russia, since 2014, amendments to GOST have been introduced to improve safety at pedestrian crossings. Thus, the "zebra" from gray and white to yellow and white, and on some sections of the road blue and white pedestrian crossing signs acquired a yellow frame. Also, on dangerous sections of roads, you can often find yellow barrels of water that protect against collisions with various static objects, and at public transport stops, a zigzag yellow line indicates a parking ban.

Quite often, yellow is used in the design of a trademark or the entire corporate identity. Thus, the yellow letter "M" makes the McDonald's logo one of the most recognizable trademarks in the world. Among the world famous companies that use the color yellow are DHL, Burger King, Chupa-Chups, IKEA, Amazon, Nikon, Chevrolet, CAT, Shell, DeWalt, MGM, 20th Century FOX, National Geographic, Rockstar Games, Star Wars, Capcom, LEGO, Warner Brothers (until 2019). In Russia, Euroset, Beeline, Yandex.Taxi and STS actively use yellow in

both corporate style and advertising.

It is quite easy for people's associations and habits to move from real life to a virtual environment. On sites, in applications and interfaces of various software, yellow is used mainly to denote auxiliary elements with which interaction is possible, such as buttons, interactive notifications, important applications and interface elements. Despite the fact that the yellow color has a signaling effect, in contrast to the alarming red, warning of a serious danger, it rather gently stimulates the psyche to important, but not critical actions, since it is perceived by a person as something positive, warm, light. For example, to rate applications, developers use assessment methods that are familiar in everyday life, which are understandable to every user. Often, a five-point grading system is used for this, with yellow or gold stars instead of a scale or numbers. Over the two decades of widespread active use of computer and mobile technologies, this method of scoring has become a kind of standard in this area. And various points and bonuses can often be found in the form of yellow (gold) coins, which often encourage the user to use the application more actively.

Interaction color is one of the tools for managing user behavior; it should be clear and reasoned throughout the interface. For a user to easily identify a call to action, it must have sufficient contrast and visual weight in relation to other interface elements. The effectiveness of interaction color is determined not by brightness and saturation, but by the speed of user identification and ease of communication. Yellow is a good choice for interaction color, especially on dark backgrounds, but it is important to include it wisely in the color palette.

Since the development of VR and AR products is closely related to the gaming industry, many elements are borrowed from one area to another. Quite often in games you can find familiar elements of everyday life that perform essentially the same functions as in reality. For example, in many products, yellow is used for navigation in the form of markings, handrails, restrictive tape, signs and signs. A person sees these objects regularly, which means that the brain will quickly perceive and process the signal that these objects give.

In video games, yellow indicates the ability to interact with an object, and therefore handles, levers, screws, ropes, and other lifting mechanisms are painted in it. Boxes with supplies and working devices are marked in yellow, various prompts, you can even find yellow signs that are placed on a wet floor to force the user to be more attentive and careful or choose a different path. In some products, the user has the ability to leave important notes and mark the path with yellow paint or flags.

As in real life, when using different applications, people develop certain habits. Experienced users know that an element colored yellow can almost always be interacted with, and a yellow non-interactive object most likely indicates some-

thing important or interesting. The yellow arrow in the navigator does not raise any questions - thanks to it, the user knows which way to take the path, and the image of a gold coin will warn about a fee or indicate a high cost of the service.

Since augmented reality interacts with the space surrounding a person, and most products are aimed at facilitating any tasks or helping the user, the designer's task is to integrate one visual environment into another as comfortably as possible for the user. To do this, he needs to maintain a balance and not overload the space with visual noise, and make visible interactive objects understandable and familiar.

Let's take a navigation app as an example. In Russia, most of the popular "navigators" have a yellow directional arrow, and on city streets yellow signs along the roads indicate the distance to large popular objects such as shopping and cultural centers, administrative buildings, etc. When developing an application for navigation in augmented reality with a character-guide, it will be wise to make the character or its elements exactly yellow, since such an object will evoke associations familiar to the brain, which will simplify the use of the application. A positive, "warm" character has more opportunities to inspire confidence and confidence in the user in the correctness of the chosen path and keep attention, while potentially dangerous areas and elements should be highlighted in red to quickly warn the user about the danger.

However, do not overload the visual space with yellow, otherwise it will simply cease to perform its main function. If a yellow object that requires attention is permanently present on the screen, secondary interface elements must be temporarily hidden from the user or made neutral, not shouting about their importance. Visible secondary objects are best done in a neutral blue spectrum, which will emphasize the main object, and not argue with it for the user's attention.

When designing an interface for AR products, it is necessary to take into account the changeability of the time of day, so the color scheme should be selected taking into account the use of the application both during the day and at night. If this condition cannot be met, "light" and "dark" themes are developed for the application for the correct operation of the application in different lighting conditions. Virtual objects should not dazzle the user or get lost against the real background.

Designing the visual environment for VR products can use proven techniques from everyday life and video games. If the application implies interactive objects in its space, to simplify the learning process, it is necessary to use intuitive signals, for example, yellow pointers, while in the presence of a flat interface it is better to abandon bright colors in it, which will distract the user from the main goal - immersion in the virtual environment.

When designing a graphical user interface, it is important to remember that

yellow is not the only accent color, but its different shades and combinations with other colors can cause conflicting emotions. To achieve the best result, the designer must understand the basics of color theory, as yellow is an effective but complex tool for managing attention. Overuse of accents and poor color combinations can greatly spoil the impression even of a product that is well-developed in the technical part. For a comfortable interaction with the interface of each user, it is necessary to take into account the physiological characteristics of different people, designing a design that is clear and readable. To do this, you can use color palettes taking into account contrast ratios and filters for color blind, or provide the user with a choice of colors. It is undesirable to use color as the only means of communication with the user and transferring information to him.

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抗精神病药物对精神分裂症患者凝血系统参数影响的研究  
**STUDY OF THE EFFECT OF ANTIPSYCHOTIC DRUGS ON THE  
PARAMETERS OF THE BLOOD CLOTTING SYSTEM IN PATIENTS  
WITH SCHIZOPHRENIA**

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随着精神药物的发现，有可能解决缓解精神障碍患者的精神运动性激越问题，减少行为障碍，治疗生产性和阴性心理病理症状。但随着时间的推移，抗精神病药物的不良作用逐渐显现。抗精神病药物的这些作用之一是它们对血液的血液学参数的影响。违反血液学参数会影响成形元素数量的变化、脂质谱的变化以及对血液凝固系统的影响。

关键词：凝血图，纤维蛋白原，抗精神病药物，精神障碍，凝血系统

**Abstract.** *With the discovery of psychotropic drugs, it was possible to solve the problem of relieving psychomotor agitation in patients suffering from mental disorders, reduce behavioral disorders, and treat productive and negative psychopathological symptoms. But over time, the undesirable effects of antipsychotic drugs were revealed. One of these effects of neuroleptic drugs is their effect on the hematological parameters of the blood. Violation of hematological parameters can affect both changes in the number of shaped elements, changes in the lipid spectrum, and the effect on the blood clotting system.*

**Keywords:** *coagulogram, fibrinogen, antipsychotic drugs, mental disorders, blood clotting system.*

A feature of the current stage of development of psychiatry is its unity with psychopharmacology. Until 1950 of the last century, there was no concept of "psychopharmacology", although some substances that affect the mental functions of a person were known. The mentally ill were treated with a variety of methods – cold

baths, wrapping in wet cloth, pyrotherapy, occupational therapy<sup>1,2</sup>. Arousal was stopped by large doses of sleeping pills and narcotic drugs<sup>3,5</sup>. The resulting effect was often insufficient in volume and unstable. The development of psychopharmacology has given psychiatry a new, effective method of targeted therapy<sup>6,8</sup>. The first antipsychotic drug is chlorpromazine, which was created in France in 1952. A little later, haloperidol was synthesized in Belgium. These drugs were the founders of neuroleptics<sup>7</sup>. With the discovery of medicinal psychotropic drugs, it was possible to solve the problem of relieving arousal, normalizing behavior, as well as psychoprophylaxis. However, over time, the shortcomings of psychopharmacotherapy were also revealed. The range of side effects with the use of psychotropic drugs was expanded together with the synthesis of new drugs and their long-term use. One of the undesirable effects of these drugs is the effect on the blood system<sup>1</sup>. According to O. Oyesanmi et al. the prevalence of severe side effects on the blood system is 1-2 cases per year per 100,000 people treated with psychotropic drugs<sup>5</sup>. Violation of hematological parameters can affect both changes in the number of shaped elements, changes in the lipid spectrum, and the effect on the blood clotting system<sup>6</sup>.

The aim of the scientific work was to study the undesirable effects of antipsychotic drugs on the parameters of the blood clotting system in patients with schizophrenia.

Clinical observations were carried out with the participation of patients suffering from various forms of schizophrenia (according to ICD 10-F20. 0-20. 7), who are being treated in the Mordovian Republican Psychiatric Hospital. All studies were carried out with the consent of patients, in accordance with the "Law on Psychiatric Care and guarantees of the rights of citizens in its provision". The study involved 15 men and 15 women aged 21 to 54 years, with an average age of 46.6±3.2. The criterion for inclusion of patients in the study was the presence of schizophrenia. The exclusion criteria are the presence of organic pathologia, severe somatic diseases. Treatment of patients was carried out by traditional methods: from the first day of stay in the hospital, antipsychotic drugs were prescribed in medium therapeutic dosages. Assessment of psychopathological symptoms was carried out using modified Avrutsky-Zaitsev maps (Avrutsky G. Ya., Zaitsev S. G., 1975). The criteria for the effectiveness of pharmacotherapy were: the completeness of the reduction of the severity of psychopathological symptoms, a decrease in the frequency of their occurrence, and the restoration of the social and labor status of patients. The blood clotting system was evaluated by the dynamics of prothrombin time, prothrombin index, and plasma concentrations of fibrinogen<sup>9,10</sup>.

The study of prothrombin time showed that a change in this indicator was observed in 11 people, while in 8 people its decrease was noted: in 6 cases with combined treatment with aminazine and haloperidol; in 2 cases with propazine.

Increased prothrombin time

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It was observed in 3 people: in the treatment with aminazine in 1 case; in the treatment with neuleptil in 1 case; in the treatment with propazine in 1 case. Prothrombin time is the time of formation of a fibrin clot in the plasma when calcium chloride and thromboplastin are added to it. The test results reflect the activity of prothrombin complex factors-I, II, V, VII, and X. The values of the prothrombin time are presented in seconds, indicating the control values obtained during the study of the control normal plasma 4, 11, 12.

When analyzing the prothrombin index, its change was revealed in 9 people, of which an increase in this indicator was observed in 8 cases: in the treatment of haloperidol and aminazine in 4 cases; in the treatment of aminazine in 1 case; in the treatment of propazine in 2 cases; in the treatment of trifazine in 1 case. When treated with propazine, a decrease in the indicator was detected in 1 case. The prothrombin index is the ratio of the clotting time of the control ("normal") plasma to the clotting time of the patient's plasma. This index shows the activation processes of the external folding path. It is displayed as a percentage, normally it is 90-105% 4, 13, 14.

INR ("international normalized ratio") - calculation of the indicator based on a mathematically calculated formula. The INR is calculated using a formula that takes into account the patient's prothrombin time and a special MICH coefficient (the international sensitivity index of the thromboplastin reagent). The use of INR allows you to compare the results obtained in different laboratories at any time. This is a standard indicator for doctors of medical organizations in all countries. It is the result of the INR test that is the basis for selecting the dose of anticoagulants, for plasma transfusions, prescribing other drugs, and for determining further treatment tactics. Normally, the INR varies in the range of 0.85 -1.15 4, 15, 16.

Fibrinogen is a protein produced in the liver and converted into insoluble fibrin – the basis of a clot during blood clotting. Fibrinogen according to the international nomenclature is a factor I (first) of the blood plasma coagulation system. It is produced by the liver and released into the blood along with several other substances that affect its clotting. If a blood vessel or tissue is damaged, the body begins hemostasis, or blood clotting, resulting in the appearance of a blood clot (blood clot), which helps to slow down and then stop bleeding. In the process, strands of protein called fibrin are formed. They intertwine, forming a fibrin network, which, together with platelets, contributes to the formation of a blood clot, which remains at the site of damage to the vessel until it is completely healed. The level of fibrinogen in the blood increases in acute inflammatory diseases, as well as in tissue necrosis. In other cases, its increase may signal acute infectious and inflammatory diseases, strokes, myocardial infarctions, hypothyroidism, amyloidosis, pneumonia, and malignant tumors. The reason for the increase in the level of fibrinogen is surgery, burns, the patient's use of estrogens or oral contraceptives.

Measured against gram per liter (g/l) varies in the range of 2-4 g/l.

You have installed the variation of this ratio in 20 cases, in all cases there was an increase in fibrinogen in the treatment of: triftazine and chlorpromazine – 1 case; triftazine – 4 cases; haloperidol and chlorpromazine – 7 cases; haloperidol – 1 case; propazine 7 cases

### Conclusions

Most of the changes in the parameters of the blood clotting system were observed in women, and in most cases this is a change in the indicators of fibrinogen, the same changes in the indicators of INR and prothrombin time. In men, as well as in women, changes in the parameters of fibrinogen, changes in the prothrombin index and slightly less INR are predominant. Most of all changes were detected in the treatment with aminazine, less with haloperidol. Less changes were found in the treatment with triftazine, propazine. From the study, it can be concluded that a group of antipsychotic drugs affects the change in the parameters of the blood clotting system, the mechanisms of these disorders require further study.

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传统烟与电子烟患者口腔液中血清IGG含量的比较特征  
**COMPARATIVE CHARACTERISTICS OF THE CONTENT OF SERUM  
IGG IN THE ORAL FLUID IN PATIENTS USING TRADITIONAL AND  
ELECTRONIC CIGARETTES**

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简介：唾液是抵御有害因素进入口腔的第一道防线。参与中和和清除体内病原微生物的抗体在产生口腔局部免疫方面发挥了最重要的作用。抗体在体内的功能是由免疫球蛋白来执行的，免疫球蛋白分为 G、M、A、D 和 E 五个类别。旨在研究 IgG 作用的研究已经证明它们能够介导身体各个部位的主动体液保护。粘膜，口腔液中IgG含量没有变化表明口腔非特异性保护的稳定性。会削弱口腔局部免疫力的因素包括抽传统香烟和电子烟。研究目的：评估传统香烟和电子烟对未受刺激唾液中血清 IgG 含量的影响。材料与方法：73名年龄在19-63岁之间的男女参加研究，参与者分为3组：第一组：抽普通烟的28人，第二组：抽电子烟的27人，第三组：18人不抽烟。采用酶联免疫法测定混合唾液中免疫球蛋白G的浓度。研究结果：第一组受试者口腔液中血清IgG含量总值为 $3.327321 \times 10^{-2} \text{g/l}$ ，第二组： $2.46963 \times 10^{-2} \text{g/l}$ ，第三组： $3.260556 \times 10^{-2} \text{g/l}$ 。结论：本研究结果反映了第一组和第二组的大量受检者的IgG含量存在不同程度的偏离常态，表明口腔非特异性保护的不稳定性。在电子烟吸烟者群体中观察到最低的 IgG 值，这再次对其与传统香烟相比的安全性产生怀疑。

关键词：局部口腔免疫，吸烟，传统香烟，电子烟，血清免疫球蛋白 G。

**Abstract.** *Introduction: Saliva is the first line of defense against harmful factors entering the oral cavity. The most important role in the creation of local immunity of the oral cavity is played by antibodies participating in the neutralization and*

*removal of pathogenic microorganisms from the body. The function of antibodies in the body is performed by immunoglobulins, represented by five classes: G, M, A, D and E. Studies aimed at studying the role of IgG have proven that they are able to mediate active humoral protection in various parts of the mucous membrane, the absence of changes in the IgG content in the oral fluid indicates the stability of the nonspecific protection of the oral cavity. The factors that can weaken the local immunity of the oral cavity include smoking conventional and electronic cigarettes. Objective of the study: to evaluate the effect of traditional and electronic cigarettes on the serum IgG content in unstimulated saliva. Materials and methods: 73 people of both sexes, aged 19 to 63, took part in the study, the participants were divided into 3 groups: 1st group: 28 people who smoke regular cigarettes, 2nd group: 27 people who smoke electronic cigarettes, 3rd: 18 people who do not smoke anything. The concentration of immunoglobulin G was determined in mixed saliva by enzyme immunoassay. Results of the study: among the participants of the 1st group, the total value of the serum IgG content in the oral fluid was  $3.327321 \cdot 10^{-2}$  g/l, the 2nd group:  $2.46963 \cdot 10^{-2}$  g/l, the 3rd group:  $3.260556 \cdot 10^{-2}$  g/l. Conclusions: the results of the study reflect varying degrees of deviation from the norm in the IgG content in a large number of examined participants of the first and second groups, which indicates the instability of the nonspecific protection of the oral cavity. The lowest IgG values are observed in the group of e-cigarette smokers, which once again casts doubt on their safety in comparison with traditional cigarettes.*

**Keywords:** *local oral immunity, smoking, traditional cigarettes, electronic cigarettes, serum immunoglobulin G.*

Saliva is the first biological fluid that comes into contact with everything that enters the oral cavity, so it is an important line of defense against emerging harmful factors. Saliva moisturizes and cleanses the tissues of the oral cavity, maintains the species composition of the microflora of the oral cavity, forms a protective barrier of mucin, antibodies, enzymes, etc. The surfaces of the mucous membranes, in particular, the oral cavity, are the main point of contact with numerous infectious agents. The first line of defense is provided by an indiscriminate mechanical action - the barrier of epithelial cells.

A more specialized action is carried out and regulated by dendritic antigen-presenting cells and other cells of the immune system of the mucous membrane, located in the local lymphoid compartments that make up the lymphoid tissue associated with the mucous membrane, as well as in the lamina propria of the mucous membrane. Cellular immunity plays an obvious role in the induction and coordination of an adaptive immune response on the surface of the mucous membranes [1], but in our work we would like to separately highlight

the importance of the humoral immune response. The most important role in it is played by antibodies involved in neutralizing and removing pathogenic microorganisms from the body, as well as various substances identified by the immune system as foreign antigens. The function of antibodies in the body is performed by immunoglobulins synthesized by plasma lymphoid cells. In humans, immunoglobulins are represented by 5 classes (G, M, A, D and E). If we consider the oral cavity, then the greatest importance is always given to the role of secretory IgA, which is present in the highest concentrations on the mucous membrane in comparison with other immunoglobulins, which, despite this, play an important role in the formation of oral immunity.

In humans, IgG makes up 75% of the total amount of antibodies, and all other classes of immunoglobulins make up about 25% in total [2]. IgG, as a rule, are the main factor of the humoral link of the immune defense, which counteracts the development of the infectious process in the body. Serum IgG enters saliva from blood plasma through the small salivary glands and the gingival sulcus. It is believed that saliva IgG mainly comes from the bloodstream, while a smaller part (less than 20%) is produced by local plasma cells in cases of lesions of the gums or salivary glands [3].

Little attention is paid to the value of the presence of IgG in the external secretion in the literature [4], but recent studies have demonstrated that they are able to mediate active humoral protection in various parts of the mucous membrane, in particular, the studies of L.E. Westerman and co-authors confirmed that serum IgG provides immunity mucous membranes against rotavirus infection [5]. Parenteral administration of passive neutralizing IgG has been shown to prevent lung infection by *Streptococcus pneumoniae* [6]. Normally, the value of IgG in unstimulated saliva is  $4.00 \pm 0.3 \cdot 10^{-2} \text{g/l}$  [7]. The absence of changes in the content of IgG in the oral fluid indicates the stability of the nonspecific protection of the oral cavity.

There are many factors that weaken the local immunity of the oral cavity, including smoking conventional cigarettes and their modern counterparts - electronic cigarettes. Smoking is a serious problem for the health care system around the world [8], it affects both innate and adaptive immunity, by exacerbating pathogenic immune responses or weakening protective immunity. Chemical compounds contained in tobacco smoke, dissolving in saliva, change its biochemical composition, reduce the activity of saliva enzymes [9, 10]. In addition, tobacco smoke is physically harmful as it increases the temperature of the mouth and causes tissue burns. Clinical examination revealed among tobacco users: hyperpigmentation, black hairy tongue, superficial glossitis, periodontitis, leukoedema, nicotinic stomatitis, leukoplakia, or neoplasm [11].

In the past 10 years, electronic cigarettes have become increasingly popular,

especially among young people, including those who have not yet smoked traditional cigarettes [12]. For most people, electronic cigarettes are perceived as a less harmful alternative to traditional ones, however, recently there has been more and more controversy on this issue. They were initially perceived as a less harmful alternative to tobacco smoking; however, this is becoming more and more controversial [13]. The aerosol generated by the use of electronic cigarettes leads to the appearance of side effects in the oral cavity: death of the oral epithelium [14] and periodontal fibroblasts occurs, and an increase in the release of anti-inflammatory cytokines occurs [15]. However, the full effect of conventional and electronic cigarettes and on the state of local immunity of the oral cavity is not fully understood.

**Objective:** to evaluate the effect of traditional and electronic cigarettes on the serum IgG content in unstimulated saliva.

#### **Materials and methods**

The study involved 73 people of both sexes aged 19 to 63 years, without pronounced concomitant somatic pathology and without severe inflammatory periodontal diseases. All participants were divided into 3 groups: 1st group: 28 people who smoke regular cigarettes, including 17 men and 11 women. 2nd group: 27 people who smoke electronic cigarettes, including 15 men and 12 women, 3rd group: 18 people who smoke nothing, including 9 men and 9 women. The concentration of immunoglobulin G was determined in mixed saliva, which was taken from subjects in the morning on an empty stomach before brushing their teeth without stimulating the salivary glands, by spitting into a sterile plastic tube in an amount of 5 ml. The test tube with oral fluid was tightly closed with a sterile cotton swab, signed with a serial number and stored vertically frozen. The quantitative determination of serum immunoglobulin G was carried out by the method of enzyme immunoassay at the Institute of Traumatology FSBEI HE "PRMU" of the Ministry of Health of Russia. For the evaluation and comparative characteristics of the results, the method of analysis of variance, the Biostat program, and the Microsoft Excel software product using the Student's test were used.

#### **Research results**

Among the participants of the 1st group, the total value of the serum IgG content in the oral fluid was  $3.327321 \cdot 10^{-2} \text{g/l}$ , and among men it was  $3.384941 \cdot 10^{-2} \text{g/l}$ , and among women  $3.238273 \cdot 10^{-2} \text{g/l}$ .

Among the participants of the 2nd group, the total value of the serum IgG content in the oral fluid was  $2.46963 \cdot 10^{-2} \text{g/l}$ , and among men it was  $2.616733 \cdot 10^{-2} \text{g/l}$ , and among women  $2.28575 \cdot 10^{-2} \text{g/l}$ .

Among the participants of the 3rd group, the total value of the serum IgG content in the oral fluid was  $3.260556 \cdot 10^{-2} \text{g/l}$ , and among men it was  $3.065556 \cdot 10^{-2} \text{g/l}$ .

<sup>2</sup>g/l, and among women  $3.455556 \cdot 10^{-2}$ g/l.

### Conclusions

The results of the study show that the most optimal serum IgG content is determined in the group of non-smoking women, and the lowest in the group of women who smoke electronic cigarettes. It should be noted that in the group of subjects who smoke regular cigarettes, the indicator is also close to the normal limits, however, if we consider not the overall value of the indicators, but individual ones, then among the participants in the third group, the serum IgG content is within the normal range in 9 out of 18 surveyed (50 % of the total), in other 9 this indicator is close to the values of the norm. Among the participants of the first group, the indicator is within the normal range only in 7 out of 28 surveyed (25% of the total number), for the rest of the participants in this group, the indicator value is in a wide range from  $1.468 \cdot 10^{-2}$ g/l to  $5.59 \cdot 10^{-2}$ g/l. Among the participants of the second group, the value of serum IgG is within the normal range in 1 of the subjects (5.9% of the total), in 12 people it is below  $3.4 \cdot 10^{-2}$ g/l, in 4 people it is above  $4.6 \cdot 10^{-2}$ g/l. Thus, we observe deviations from the norm in the IgG content in a large number of examined participants in the first and second groups, which indicates the instability of the nonspecific protection of the oral cavity. The lowest IgG values are observed in the group of e-cigarette smokers, which once again casts doubt on their safety in comparison with traditional cigarettes. In conclusion, it is worth noting the relative hygiene of the use of traditional cigarettes, since they are disposable, and, most often, one cigarette is consumed by one person. If we talk about the use of electronic cigarettes, then it should be borne in mind that the device supplying smoke is reusable, which contributes to the accumulation of microorganisms and various substances on its surface. In addition, sometimes in companies, people share one electronic device, which is not hygienic, since there is an imperceptible salivation, there is a high probability of contracting many infectious diseases, including the herpes virus and tuberculosis, all of which together contribute to a decrease in the local immunity of the oral cavity.

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创伤学和骨科改革者 (G. A. ILIZAROV 诞辰一百周年)  
**REFORMER IN TRAUMATOLOGY AND ORTHOPEDICS**  
**(TO CENTENARY OF G.A.ILIZAROV)**

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文章分析了二十世纪杰出的苏联骨科医生——Gavriil Abramovich Ilizarov 的独特个性。展示了Ilizarov方法在国内外创伤学和骨科领域形成和发展的演变过程。由 Ilizarov 开发的外固定系统不可否认的优势被揭示出来。考虑了 Ilizarov 压缩-牵引装置的设计。熟悉 G.A. Ilizarov, 作者分享了他对他的回忆, 描述了 Ilizarov 系统对骨骼和其他组织影响的生物学和力学特征, 这已成为治疗骨折患者的经典和国际公认的, 肌肉骨骼系统的病理状况, 四肢的先天性和创伤后畸形畸形。

关键词: Gavriil Ilizarov, 成骨, 创伤学, 骨科, 牵引, Ilizarov 装置, 骨伸长

**Abstract.** *The article analyzes the unique personality of the XX century, the outstanding Soviet orthopedic surgeon-Gavriil Abramovich Ilizarov. The evolutionary process of the formation and development of the Ilizarov method in traumatology and orthopedics at the domestic and world level is shown. The undeniable advantages of the external fixation system developed by Ilizarov are revealed. The design of the Ilizarov compression-distraction apparatus is considered. Being familiar with G.A. Ilizarov, the author shares his memories about him, describes the biological and mechanical features of the influence on the bone and other tissues of the Ilizarov system, which has become a classic and internationally recognized in the treatment of patients with fractures, pathological conditions of the musculoskeletal system, congenital and post-traumatic orthopedic deformities of the limbs.*

**Keywords:** *Gavriil Ilizarov, osteogenesis, traumatology, orthopedics, distraction, Ilizarov apparatus, bone elongation.*

**Formulation of the problem.** *The Ilizarov method of lengthening, reconstruction and osteosynthesis of bones has received tremendous development since its introduction by G.A. Ilizarov in the Soviet Union in the 1960s and Western countries*

in the early 1980s. The Ilizarov method has become an integral part of the arsenal used by the orthopedic community around the world, whose evolutionary development and its current role have significantly improved the quality of life of millions of people. Despite the great versatility of its possible applications for bone injuries and diseases, the Ilizarov method cannot be an alternative to a number of other methods used for some specific bone conditions. Gavriil Ilizarov himself warned not to consider his system unified. The research problem is due to the lack of a comprehensive comprehensive analysis of the unique methodology of the Soviet doctor Gavriil Abramovich Ilizarov in the context of a retrospective analysis of his method in orthopedics and traumatology in order to determine promising directions for further scientific research in this area, taking into account the personal acquaintance of the author of the article, focused primarily on the implementation and practical use in clinical work.

**Analysis of recent research and publications.** Issues related to the personality of the great doctor Ilizarov, as well as modern experimental studies regarding the use of the method of distraction osteogenesis (Ilizarov's method) were highlighted in the works of Russian (A. Ya. Adsmadi, E.I. Solod, M.A. Ivashkin, A. A. Artemiev, A. M. Koshub [1], A. V. Gubin, D. Yu. Borzunov, T. A. Malkova [3], E. I. Ilizarova-Abaeva [4], E.A. Melikov, A.Yu.Drobyshev, IA Klipa, S.A. Snigerev, S.V. Shamrin [5],) and foreign researchers (J.G. Birch, M.L. Samchukov [6], M. Bisaccia, C. Ibáñez [7], J.J. Jr. Gugenheim [11], D. Lowenberg, M. Githens [12], etc).

So, according to J.G. Birch, M.L. Samchukov, the introduction in the West in the early 1980s of the circular external fixator and the Ilizarov method led to rapid progress in limb lengthening, deformity correction, and reconstruction of segmental long bone defects [6]. Mechanical features and biological response to the use of distraction osteogenesis with a circular external fixator are unique aspects of G.A. Ilizarov. In experimental studies conducted by J.G. Birch, M. L. Samchukov, as well as the experiments of D. Lowenberg, M. Githens, the most common indications for children and adolescents are limb lengthening and angular deformity correction [6; 12]. Indeed, the surgical application and postoperative management of the Ilizarov apparatus requires meticulous attention to detail by both the patient and the surgeon. In addition, a thorough understanding of the basic principles of the Ilizarov apparatus, mechanical axial adjustment, potential complications and the biological response to stretching is required from the surgeon.

J.J. Jr. Gugenheim substantiates that the Ilizarov method is widely used for the formation of bone and soft tissue using an external fixator, consisting of small pins, tension wires, rings, hinges and distractors [12]. The success of the technique, as the author rightly claims, depends on the observance of the principles of the Ilizarov "stress-strain" phenomenon: preservation of blood supply to tissues,

frequent distraction with small increments, and full-fledged function of the limb.

**Isolation of previously unresolved parts of a common problem.** Despite Ilizarov's international recognition, including the creation of the Association for the Study and Application of Ilizarov's Methods, the invitation of Gavriil Abramovich to international symposia, conferences, opposition and skepticism from the Moscow medical establishment continued until the last years of Ilizarov's life, limiting the great doctor in many titles and awards, including yourself the opportunity to be a member of the Academy of Medical Sciences of the USSR, awarded the Nobel Prize, etc.

**The purpose of the article** is to review the Ilizarov method and its undeniable advantages in modern surgery in the treatment of various pathological conditions of the musculoskeletal system.

**Presentation of the main material.**

Gavriil Abramovich Ilizarov - Soviet physician, Doctor of Medical Sciences, Professor, Academician of the Russian Academy of Sciences, Hero of Socialist Labor, Honored Inventor of the USSR, famous for the invention of the Ilizarov apparatus for lengthening limb bones and the method of surgery named in his honor by Ilizarov surgery.

G.A. Ilizarov was born on June 15, 1921 as the eldest of six children into a poor Jewish family in Bialowieza (Polesie Voivodeship, Poland). Soon after his birth, the family moved to his father's parents in the city of Gusar (Azerbaijan). His father, Abram Ilizarov, was a Mountain Jew from Gusar, and his mother, Golda Rosenblum, was a Jew of Ashkenazi origin.

G.A. Ilizarov graduated from the Buinaksk Medical Rabfak (an educational institution created to prepare workers and peasants for higher education). In 1939 he entered the Crimean Medical School of Simferopol. After the outbreak of the Great Patriotic War in 1941, the school was evacuated to Kyzylorda in Kazakhstan. After leaving school in 1944 G.I. Ilizarov was admitted to a rural hospital in Dolgovka, Kurgan Oblast in Siberia, 2,000 kilometers east of Moscow. In 1950, Ilizarov received a position in the department of the Kurgan Regional Clinical Hospital as an air ambulance surgeon. In 1955 he became the head of the department of traumatology and orthopedics of the Kurgan regional hospital for war veterans.

**Residency training and Ilizarov's unique experiments.**

Ilizarov's residency was in orthopedic surgery, during which he developed a system of external fixation (1951). Gavriil Abramovich found that by carefully cutting off the bone without tearing the periosteum around it, you can slightly separate the two halves of the bone and fix them in place, and the bone will grow, filling the gap that has formed. At the same time, G.A. Ilizarov found that bone grows back at a fairly uniform rate in different people and circumstances.

These experiments led to the creation of the so-called Ilizarov apparatus, which holds the bone torn in this way in place thanks to the skeleton and pins passing through the bone, and separates the halves of the bone by a tiny amount; by repeating this over time at the rate of bone growth, the bone can be lengthened as much as desired. This procedure was inspired by the horse-drawn carriage archery harness. Originally, bicycle parts were used for the frame.

The reason for the creation of the external fixation system was the stay in the village. Dolgovka, where Ilizarov faced a huge number of pathologies, but had the minimum amount of technologies available to him. Open fractures often resulted in septic non-union. Chronic pain, drainage and bone destruction with shortening of the limbs were common. In turn, Ilizarov used sterile bicycle spokes attached to pieces of metal as external fixation for these septic non-joints. Through clinical experience and laboratory experiments on animals, he found that he could eliminate infection and heal through the gradual, controlled manipulation of the device. Most importantly, no antibiotics or bone grafting were required.

Later G.A. Ilizarov tried to correct the inequality in the length of the limbs. During his research, he found that he could create an osteotomy in a long bone, distract the ends with a retainer, and form new bone in a slowly widening distraction gap. Creating the right environment and technique for this to happen reliably and reproducibly took years of critical experimental and clinical research.

Simply put, if tissues are stretched in a certain way, they lengthen or grow without the need for transplantation. This process of distraction histiogenesis depends on adequate vascularization and functional use of the limb. This is a clear departure from the previous concepts of lengthening and correction of limb deformities. When this principle is used in conjunction with the Ilizarov External Circular Fixator in properly planned and guided surgery, the potential for managing bone and soft tissue problems in the extreme extremities is enormous. In the Soviet Union, the Ilizarov method is essentially a field of medicine, parallel to, but different from, Western orthopedics.

For a long time, Ilizarov faced skepticism, resistance and political intrigue from the Moscow medical establishment, which tried to defame him by calling him a "charlatan." However, the steadily growing statistics of successful treatment of patients led to an increase in Ilizarov's fame throughout the country. He became known among his patients as the "mage of the Kurgan". In 1968 G.A. Ilizarov defended his doctoral dissertation in Perm and was awarded the title of Doctor of Science, bypassing the degree of Candidate of Science, for which the dissertation was originally prepared.

The breakthrough came in 1968, when Ilizarov successfully operated on Valery Nikolaevich Brumel, the 1964 Olympic champion and long-term world record holder in men's high jump, who injured his right leg in a motorcycle accident. Be-

fore coming to Ilizarov V.N. Brumel spent about three years unsuccessfully treated in various clinics and underwent seven invasive and 25 non-invasive operations.

The confrontation between the Moscow medical establishment continued until the last years of Ilizarov's life. Back in 1991, just a year before his death, Ilizarov was elected a full member of the Russian Academy of Sciences. Despite numerous awards and worldwide recognition, he was not elected to the Academy of Medical Sciences of the USSR.

**Ilizarov's international recognition.** The method, developed in 1951 by Professor of the Soviet Union Gavriil Ilizarov, represents an unexpected breakthrough in the treatment of most pathological conditions of the musculoskeletal system by using a complex external fixator, creating an osteotomy and gradually and controlled manipulation of the structure in order to form new tissue.

The most notable application of the Ilizarov apparatus is the inequality of the length of the limbs, it is also used to treat fractures, non-adhesions, arthritis and multiplanar deformities of the limbs. In the Western world, the management of these states has traditionally been based on principles and methods, which in many cases were very different from those advocated by Ilizarov [13].

External fixation for the treatment of fractures complicated by significant soft tissue trauma dates back to Hippocrates. In 1905, A. Codivilla from Bologna published the first report on surgical limb lengthening in the English literature [8]. Since then, due to limited success and high complication rates, there have been many attempts to improve methods and devices for limb lengthening. Since the early 1970s, the Wagner method has become the most popular limb lengthening procedure in the West. In 1963, Professor Heinz Wagner from West Germany developed a one-sided external anchor consisting of two large threaded pins (5 mm in diameter) that are inserted perpendicularly into both the proximal and distal ends of the bone [17]. The pins are connected to a telescopic rectangular bar. An open osteotomy is performed with an oscillating power saw or by connecting multiple drills to an osteotome. The osteotomy is immediately detached by 1 cm and the device is fixed. The next day and each subsequent day, the handle at the end of the device is rotated one full turn, creating 1 mm distraction of the bone segments. Due to insufficient strength and stability of the cantilever system, the weight of the bearing is not allowed. When the desired length has been reached, a second anesthetic is required for covering and bone grafting of the lengthening gap. This is done through a long incision. Bearing weight is still not allowed. A third anesthetic is needed to remove the apparatus when the bone is already hard.

The main disadvantages of the Wagner method include the need for three anesthetics, several months of weightlessness, accompanying osteopenia of the entire limb, and long unsightly scars [16]. In every clinical review of Wagner's limb lengthening, the complication rate was also high and the ability to achieve the

desired amount of lengthening was low. Nevertheless, the Wagner method was better than its predecessors. The reports of the very successful Soviet method of lengthening the limbs without complications that appeared in the early 1980s met with some skepticism in the West. It was even more difficult to accept the fact that it was developed in 1951, 20 years before Wagner's method.

Scattered reports appeared in the Western press about the successful treatment of Brumel by Ilizarov. The first foreign medical visitor was Dr. Johannes Hellinger from the former GDR (German Democratic Republic), Erfurt Medical Academy in 1970. He made the first publication in a Western medical journal on the Ilizarov method. In 1980, during the Cold War era, Carlo Mauri, an Italian mountaineer, explorer and photojournalist, at the insistence of his Russian colleague Yuri Senkevich, traveled to Kurgan, in the Soviet Union. He had to be treated by Ilizarov for a fractured tibia, which healed improperly after a ski accident ten years ago. Italian doctors have long given up hope of any surgical improvement in the leg. Ilizarov distracted the frozen non-union in the tibia by 2 cm, cured pseudarthrosis, corrected the equinus deformity with distraction and lengthened the leg. In turn, K. Maury christened Ilizarov "Michelangelo of Orthopedics". On his return to Italy, the healing of Mauri's leg amazed the orthopedic surgeons. Thereafter, Antonio Bianchi-Maiocchi and Roberto Cattaneo invited Ilizarov to speak as a guest speaker at the AO Italy conference in 1981 in Bellagio. Thus, Ilizarov gave three lectures at conferences to more than 200 participants from Italy, France, Switzerland, Austria and Germany. At the end of the lectures, Ilizarov deserved a ten-minute standing ovation. This was the first time Ilizarov spoke outside the Iron Curtain.

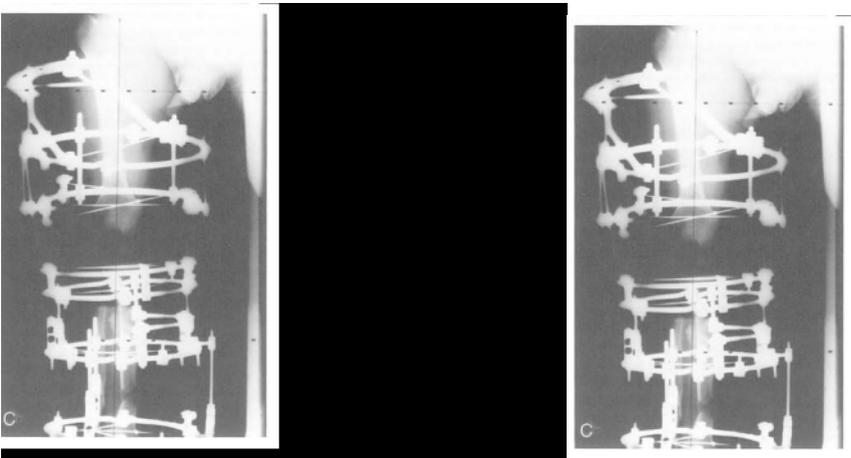
In 1982, the Association for the Study and Application of the Methods of Ilizarov (ASAMI) was formed in Italy. In 1983, the Medicalplastic company, owned by Bianchi-Maiocchi, licensed the equipment from the Soviet authorities, registered the ILIZAROV trademark and began to manufacture and sell the Ilizarov apparatus. In the following years, the Ilizarov method quickly spread throughout most of Western Europe. ASAMI has organized courses in Italy, Portugal, Switzerland, France, Spain, Greece, Brazil and the United States. ASAMI groups were formed in France, Spain, Belgium, Portugal and Brazil.

In 1986-1987, the method was brought to North America by Viktor Frenkel, President of the Joint Disease Hospital, Dror Paley, Alfred D. Grant and Stuart Green, who edited the first English translation of Ilizarov's book in 1992. More than 300 American orthopedic surgeons took part in an international symposium organized in 1987 in New York by the Joint Disease Hospital and Smith & Nephew to listen to Ilizarov's lectures. Smith & Nephew began distributing the Ilizarov external fixator in the United States and around the world [2].

In 1989, Dietmar Voltaire organized the Ilizar Conference in Hamburg. In

1990, Ilizarov came to the second conference in Hamburg, where he became one of the founders of the German Ilizarov Society (Deutsche Ilizarow-Gesellschaft). The hospital of the German Association for Accident Prevention and Insurance (Berufsgenossenschaftliches Unfallkrankenhaus, BGUK) in Boberg, Hamburg, has become a major center in Germany applying and promoting the Ilizarov method. A visit to the Kurgan center for the study of the Ilizarov method has become mandatory for all senior doctors of the hospital.

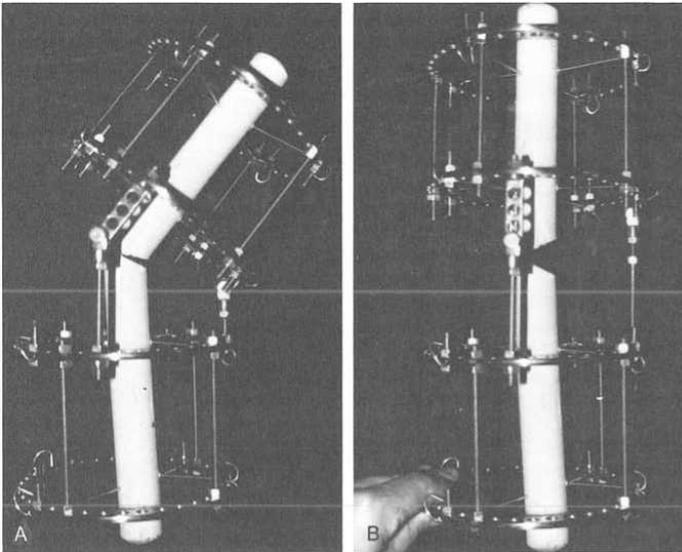
**The design of the Ilizarov apparatus.** The Ilizarov apparatus (fig. 1), includes a circular external fixator, consists of thin wires (1.5 mm and 1.8 mm in diameter) drilled through the transosseous bone and fixed at both ends with bolts and nuts under high tension (from 90 up to 130 kg) to stainless steel rings. Two to four wires and one to two rings are required both proximal and distal to the site of elongation or deformation. The rings are connected by three or four threaded rods located around the circumference. By turning the nuts on the rods, the rings (and therefore the bone segments) are distracted. The use of rings and crossed wires, rather than a single-sided rod and half-pins, gives the device better control of the bony segments in all planes. This is important in order to be able to support the weight during limb lengthening. This feature allows you to correct other deformities with or without simultaneous lengthening of the limbs.



**Fig. 1. Ilizarov apparatus**

- A) The femoral and tibial frames are in place when performing a three-level simultaneous deformity correction;*
- B) Small incisions for corticotomy are visible;*
- C) Radiographic appearance during the neutralization phase [13]*

Unilateral external anchors can simply hold bones in place or perform unilateral lengthening. The actual placement of the Ilizarov wires and the design of the frame are determined by the individual needs of the patient. The Ilizarov apparatus is, in fact, a "surgical erector" with an almost unlimited number of possible options for the arrangement of components. An important design feature of the Ilizarov apparatus and the reason for the correction of multiplanar deformities is the hinge (fig. 2) - an axis around which two movable parts can rotate in one plane. There are also universal joints that allow you to move between parts in more than one plane. The hinges are simply made from Ilizarov components and are attached to the rings with connecting rods. Special wires called olive wires are used in specific locations when loops are used. A metal ball on a wire rests on the cerebral cortex to prevent the bone from sliding uncontrollably along the wire.



**Fig. 2.**

*A) A simple hinge centered over the convex cortex at the level of the angular deformation. The wires and rings are perpendicular to each bone segment.*

*C) After corticotomy, distraction of the concave cortex occurs by 0.25 mm every 6 hours. The wires and rings of both segments are parallel at the completion of the deformity correction [13]*

During deformity correction, by careful placement of hinges and other components, multi-plane deformations can be corrected simultaneously with lengthening or sequentially without going back to the workroom or adding wires. In the Soviet

Union, about 1 million procedures were performed. These numbers include limb lengthening as well as all other applications. The results are impressive. Increasing the length of the limbs is achieved with fewer complications than with the Wagner method, and more versatility for correcting other forms. It should not be denied that complications arise with the Ilizarov method, but the frequency and severity of their occurrence is much lower.

**Rehabilitation aspects of the method.** G.A. Ilizarov has long recognized the importance of rehabilitation for the success of his method. His research has shown that weight tolerance and physiological use of the limb during treatment are important for the quality and rate of new bone formation, prevention of osteopenia in the entire limb, and maintenance of the functional integrity of soft tissues.

Soft tissues, like bone, undergo lengthening as a result of distraction histogenesis. Only the bone is rigidly fixed by external fixation devices. Soft tissues are freely threaded and, when lengthened, depend on their bony attachments for tight control. Due to the asymmetric arrangement of muscles around and across the joints, distraction leads to joint contractures and limitation of joint movement, and can also lead to subluxation or dislocation of the joint [10]. Fortunately, these problems can be avoided or minimized with careful attention to rehabilitation. Although Ilizarov reports a very low incidence of pain during lengthening [18], experience in the West shows that patients often have chronic, dull, aching pain during the distraction phase of lengthening, especially with longer lengthenings [14]. The pain increases with physical therapy, walking, and at night. Ilizarov believes that the pain occurs due to improper use of the device or due to an infection of the gastrointestinal tract. Some pain behavior is physiology and some is studied. Even today in Kurgan, drugs, like aspirin, are in short supply. Complaining about pain will not help much to resolve it [9; 13].

**The opening of the Ilizarov Center.** In 1971, the Kurgan Research Institute of Experimental and Clinical Orthopedics and Traumatology (KRIECOT) was established. The center uses the Ilizarov method of transosseous osteosynthesis to lengthen or change the shape of the limb bones. Ilizarov headed this center until 1991. With about 1000 beds, 24 operating theaters and 168 working doctors, the Center has become the largest orthopedic clinic in the world. After the death of the great orthopedic surgeon, the center was renamed the Russian Ilizarov Scientific Center for Restorative Traumatology and Orthopaedics (RISC RTO).

Over 40 years of work, Ilizarov and his clinical and research associates have published more than 2,000 articles on topics ranging from the biology of distraction histogenesis to reviews of clinical results and technical considerations of the technique. Today the center employs ten professors, 34 doctors of sciences and 193 candidates of sciences. The center includes an outpatient clinic where 250 patients are consulted daily, a hospital with 800 beds, an experimental department

and animal surgery. More than 9000 people are treated at RISC RTO every year.

**Personal acquaintance of the author with Ilizarov.** As a senior researcher at the Center for Household Traumatism of the Central Institute of Traumatology and Orthopedics named after N.N. Priorov in 1980, I was sent for a four-month internship at the Kurgan Research Institute of Clinical and Experimental Traumatology and Orthopedics, where courses were organized at the Department of Advanced Medical Studies on the Ilizarov system of treatment of fractures and deformities. This period became a significant stage in my life, since later I was invited to Turkey (Trabzon. Department of Traumatology and Orthopedics of the Medical Faculty of the Black Sea Technological University) to implement the Ilizarov system. The fact is that Turkey acquired a license to manufacture the Ilizarov apparatus and sold them to many African countries. The design of the device was better than in the USSR, and they designed the spoke tensioner technologically convenient to use. Turkish colleagues showed great interest in the Ilizarov studies and demonstration operations, and the Ilizarov methods gained great popularity in Turkey, although their medicine has long been focused on German.

From personal memories: *In the morning, intensive theoretical and practical classes were held in Kurgan. In the very first days I tried to go to G.A. Ilizarov, but in front of his office every day there was a very large number of patients from different republics of the Soviet Union and even other countries of the world. It was not possible for me to stand this line, skipping classes. Therefore, one day I handed over a note to the secretary G.A. Ilizarov about her desire to meet with him. Soon I was invited to a meeting in the office of the legendary Gavriil Abramovich.*

The meeting lasted more than an hour. Ilizarov gratefully recalled my article on distraction in hand surgery, saying: "I have not yet reached the hand." Upon learning that I was from Dagestan, Gavriil Abramovich became interested in everything that was happening in Dagestan. He said that "without a single ruble from the budget of Dagestan, he will be able to build a Traumatology and Orthopedics Center for the entire North Caucasus on the shores of the Caspian Sea, if Dagestan so desires, because the chairman of the government of the Soviet Union Nikolai Ivanovich Ryzhkov is very respected." On the same day G.A. Ilizarov sent a registered letter to M.M. Magomedov. - to the chairman of the State Council of Dagestan, but I did not receive an answer. I sent the same letter again from Moscow, and again, a strange silence...

At the end of that meeting, I presented Gavriil Abramovich with an Untsukul ink set, which made him very happy. And he gave me a photo with the inscription: "To my native Dagestan and the wonderful multinational people of the country of mountains with love and with the kindest wishes." Later, at a meeting in Moscow, Gavriil Abramovich asked me: "I have been allocated states. Would you like to go with me to Kurgan to head the new department?" I gratefully hugged the great

compatriot and stayed to work at CITO, because I had to think not only about myself, but also about my family: my wife, a professor of the medical institute and my daughter, a student of the medical institute. It is not easy to change the familiar to the unknown.

In my opinion, the discovery of the "Biological phenomenon (effect) of Ilizarov" deserves the Nobel Prize, but the communist ideology mistakenly believed that the Lenin Prize (Ilizarov was awarded this prize in 1978) is more prestigious than any (including the Nobel) "capitalist" awards. This postulate of the time put him to be the Nobel Prize laureate and the brilliant designer of spaceships Sergei Pavlovich Korolev, whose jaw was broken by the overseer's boot during the repression, mockery and beating him in the dungeons of the Stalinist Gulag. It is regrettable when politicians, dictators supervise science and command over scientists.

Assist G.A. Many colleagues were afraid of Ilizarov, because Gavriil Abramovich had a habit of sharply, loudly and publicly expressing his dissatisfaction. But I myself impelled myself to assist him, and in the preoperative room, while washing my hands, half-jokingly and half seriously told him: "Gavriil Abramovich! We are fellow countrymen and therefore must show everyone the culture and friendship of the Dagestanis; therefore, we should not swear at each other in front of others. " Of course, I took a risk, but he was a man with humor, he understood my trick, smiled and we always worked very collegially during the operation.

It is worth saying that Ilizarov operated brilliantly and extremely boldly, but deliberately. He had fantastic volumetric thinking and understanding of the course and outcome of the operation. I especially remember one technique. Gavriil Abramovich had the highest (obsessive) idea: "As long as I live," he reasoned, "I must determine the possibilities and limits of my system." And so Ilizarov undertook to treat the most difficult patients with the most incredible deformities. He even treated the genius composer Dmitry Shostakovich, who wrote a letter to the GS of the CPSU Central Committee L.I. Brezhnev about Gavriil Ilizarov. Then there was a call from the Minister of Health of the USSR, academician B.V. Petrovsky. After that, Gavriil Abramovich was invited to CITO and already M.V. Volkov was forced to publicly give the floor to G.A. Ilizarov. for the performance. The large assembly hall of CITO was overcrowded and the colleagues of the capital listened with admiration for two hours to the speeches of G.A. Ilizarov with the display of X-ray transparencies of patients before and after treatment. This was his historic performance.

G.A. Ilizarov was not an "easy" person. In general, people of genius are not "comfortable, sweet and forgiving." He fired the doctor, who put a plaster cast on his mother with broken ankles on duty and let her go home. Ilizarov rightly believed that in order to use traditional methods of treatment, one should work not in

a research institute, but in a city hospital.

G.A. Ilizarov began to develop a treatment for congenital hip dislocation using an apparatus of his own design. This is a very complex pathology. The head of the children's and adolescent department of the Gorkovskiy (now the Volga Federal Medical Research Center (VFMRC) in Nizhny Novgorod) of the Research Institute of Traumatology and Orthopedics A.A. Abakarov (Dagestani). He was a recognized specialist among pediatric orthopedists of the Soviet Union. He inquired about Ilizarov's method of treating patients with congenital hip dislocations. I will not describe this complex technique in detail, but I will emphasize that G.A. With this pathology, Ilizarov was able to create a new support for the proximal thigh, lengthen the leg so that the patients stopped limping. Abakar Alievich was delighted with this idea and later he himself was the first to successfully use many of the ideas of Gavriil Ilizarov in the country.

Once, when G.A. Ilizarov passed the wire into the proximal thigh, it (the wire) got stuck. Turning to me, he asked: "Magomed, where is our knitting needle?" Without thinking twice, my answer sounded: "Gavriil Abramovich! It seems that she got a little confused along the way and went to the back of the head of the thigh; to ferry it forward." Ilizarov did just that. The operation ended successfully. You need to know that no one ever dared to object to him, but then he calmly listened to me and even thanked me after the operation.

**Warm memories of Ilizarov from friends.** The great Ilizarov also had to overcome enormous obstacles, difficulties, difficulties and even treachery before he received the All-Union and Worldwide vocation. Neurophysiologists believe that "envy is a disease of the brain," and in Christianity, envy is considered "one of the seven deadly sins." Unfortunately, science and medicine are also not free from envy, meanness, lies and even deceit.

Rasul Gamzatovich and Gavriil Abramovich were in great friendship with each other. Rasul Gamzatov's poem dedicated to Gavriil Ilizarov was published in the main newspaper of the Soviet Union, Pravda.

*Gavriil Ilizarov, a skilled Luqman,  
I will come to Kurgan, but not to visit,  
But so that for love that suffered from wounds  
You healed the broken bones.  
Who gave you good luck talisman,  
I only have freedom to guess:  
Maybe the mountainous Urals, maybe our Dagestan,  
Where you were appointed to heaven from birth?  
Forcing any illness to retreat as in battle,  
You have earned the right to sorrow,  
As to heal a mental dislocation, my friend,*

*Is harder than a dislocated joint.  
Know that God himself would be your student,  
If could you, sparing no effort,  
The connection of times, Gavriil, could restore,  
Like ligaments of human tendons.  
And I'll come to Kurgan, no matter if called,  
And I'll say: "You will comfort my heart,  
A man who with the great power of love  
Returnins Hope to People" (1984).*

Writer and academician B.Sh. Nuvakhov writes in his book about Ilizarov: "I was friends with this wonderful doctor and scientist. Such personalities are born once a century. I visited him in Kurgan and together with him in many countries of the world and in our native Derbent. Gavriil Ilizarov also visited me with Rasul Gamzatov and his wife Patimat Saidova. Gavriil Abramovich was a wonderful conversationalist, a man with great dignity and inner freedom. His love for the medical profession was fantastic. " On the same days, the newspaper Moskovskaya Pravda (editor-in-chief MR Poltoranin) published an article by B.Sh. Nuvakhov (he is also a Dagestani) exposing M.V. Volkova.

Director of CITO (Central Institute of Traumatology and Orthopedics named after N.N. Priorov), academician of AMS USSR Volkov expressed to me (a Dagestani) his displeasure with these publications, which became a serious obstacle for me in my scientific and official career. A talented scientist, chief traumatologist-orthopedist of the USSR Ministry of Health M.V. Volkov, unfortunately, then became the main opponent of G.A. Ilizarov, which negatively affected the fate of Mstislav Vasilyevich himself. It's a pity, because together they could raise Soviet traumatology and orthopedics to unprecedented heights on a planetary scale. Here the "friends" of the CITO director also played a fatal role. Better to have one friend with the truth than hundreds of flattery.

At the same time, one cannot fail to note the warm attitude of A.A. Kaplunov to Ilizarov, who dedicated to him the book "Unknown Ilizarov: strokes for a portrait" (Notes of an eyewitness), where A.A. Kaplunov tells about the years of joint work of the author with the famous Russian scientist-innovator surgeon Academician G.A. Ilizarov. It reveals the personality traits of Ilizarov as a person, mentor and leader at the stage of formation of the method of treatment he developed and gaining the first recognition in domestic medical science. A.A. Kaplunov said about Ilizarov: "This is a large personality, a distinctive genius and a great doctor of the twentieth century."

Dmitry Dmitrievich Shostakovich, a great composer and musician, Ilizarov's patient, with the following address characterizes the attitude towards G.A. Ilizarov: "Gavriil Abramovich Ilizarov is dear to me, and I have great respect for his talent-

ed employees. Gavriil Abramovich has an amazing gift: to return people to health, efficiency, joy. He doesn't just heal a disease, he heals a person. It would be gratifying if in our country there were more such gifted doctors devoted to medicine and people, as adherents of Ilizarov's teachings. "

I share the delight of Professor L.D. Vorontsov, who argued that "the bone, hitherto considered a little compliant organ, in the hands of craftsmen, when using compression-distraction osteosynthesis, turns almost into clay, some kind of plastic mass that can be easily changed. I am completely delighted with the success achieved by the Ilizarov school! "

G.A. Ilizarov was fanatically in love with his system, worked tirelessly, traveled a lot to many countries of the world with lectures and for demonstration operations. "Genius is the highest ability to concentrate attention on the studied subject," said Ivan Pavlov, Nobel Prize laureate, physiologist.

According to E.I. Ilizarova-Abaeva, "Ilizarov is a reformer who changed the idea of bone surgery in the second half of the XX century." I will quote from the speech of the Honored Scientist of the Russian Federation, Head of the Department of Traumatology, Orthopedics and Disaster Medicine of the Moscow State University of Medicine and Dentistry named after A.I. Evdokimov, Professor Vasily Iosifovich Zorya in Moscow, which took place on November 4, 2017 at the International Conference "TRAUMA-2017": "Gavriil Ilizarov is the apostle of traumatology and orthopedics. There was no such genius, and is not expected in traumatology and orthopedics".

From quotes from Ilizarov himself: "Over the years, I have experienced not only a continuous, but constantly growing interest in my profession, my business. And, of course, the feeling of responsibility for the results of his work, characteristic of a real doctor. Striving to see as many people as possible happy".

**Conclusions and suggestions.** While the Ilizarov method is clearly a very powerful tool, it is necessary to understand the reasons for its wide range of indications and its current usefulness in the Soviet Union and other Eastern European countries. The financial and technological limitations of the Soviets in providing patients with a sufficient amount of appropriate antibiotics played an important role in the development of the Ilizarov method. The lack of antibiotics, on the one hand, created significant bone and joint diseases for treatment and, on the other hand, limited certain treatment options. The risk of deep infection complicating internal fixation even with closed fractures or clean, elective surgery was and remains high.

There is an acute shortage of goods and services. The Soviets did not have the technology or financial support for prosthetic devices that would make amputation a reasonable alternative for certain muscular skeletal problems. Surgically rescuing a severely deformed limb is cheaper than amputating, even if that means

months of hospitalization and rehabilitation thousands of miles from home [14].

The 1970s saw a resurgence in the use of external fixation to treat limb fractures and deformities throughout Europe and the United States. Advances in materials and techniques have reduced soft tissue complications that previously precluded the use of this technique. At the same time in Kurgan, in the then Soviet Union, G.A. Ilizarov developed his own method of distraction osteogenesis. This important achievement contributed to the lengthening of the limbs, the elimination of many complications and a decrease in the volume of surgical intervention. This technique preserves the osteogenic elements in the limb. He perfected a high-frequency, fine-paced distraction rhythm that allowed good bone to regenerate and reduced soft tissue complications such as nerve and vascular damage. This technique produces good quality bone formation, minimizing the incidence of unevenness (requiring further bone grafting) or premature consolidation of the elongated segment (requiring repeated osteotomy and osteoclase). The lengthening of the limb segment up to 140% is now not only possible, but also commonplace. With his clinical observations and experimental (in KRICETO there is a powerful experimental department with modern equipment) G.A. Ilizarov and his colleagues proved that the healing of fractures when using a compression-distraction system occurs two or even three times faster than when treating fractures using extra plates and intraosseous pins. Gavriil Ilizarov emphasized that he had developed not only the apparatus, but most importantly, the system of compression-distraction osteosynthesis.

As Ilizarov's methods were mastered in Europe and the United States, advances in materials and biomechanics of external fixators quickly modified the technique. This has expanded the indications for the treatment of congenital and acquired limb malformations. Various external retention configurations modifying the ring retainer to uniplanar and biplanar frames and adding transaxle pins and half pins to wire retention methods are now standard [15].

Complications still interfere with the successful treatment of limb deficiencies. These complications are predictable enough to change the nomenclature in the limb lengthening literature. Only those complications that change the predicted outcome are truly "complications". Future trends towards improving the Ilizarov method will reduce the incidence of complications.

The Ilizarov method is an important addition to the orthopedic surgeon's arsenal of treatment methods. By combining stable external fixation with precise and controlled corticotomy and using a new understanding of the biology of tissue elongation in Western medicine, complex deformities and significant inequality in limb length can be successfully corrected with minimally invasive surgery.

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石灰石采石工人牙周免疫系统及职业条件识别  
**IMMUNE SYSTEM OF PERIODONTIUM AND IDENTIFICATION OF  
PROFESSIONAL CONDITIONS IN LIMESTONE QUARRY WORKERS**

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在我们的文章中，我们研究了免疫球蛋白、白细胞介素系统的浓度，并观察了使用基于“胎盘素”的敷料进行专利治疗前后的变化。研究材料是患者的口腔液。我们观察了来自 214 名员工的 67 名被诊断为轻度慢性牙周炎的患者。患者是石灰石采石场的工人。我们通过石灰石采石场工人的慢性全身性牙周炎揭示了该疾病的职业依赖性，结果证明他们是高度条件化的（即工作条件影响牙周状态）。治疗结果令我们满意，我们在第四次就诊时取得了临床改善。

牙周免疫系统的工作部分取决于慢性炎症病理过程的发展方向。慢性免疫炎症发病的主要原因可能是粘膜系统水平的局部障碍或全身水平的小异常。这项任务很复杂，从免疫学位置和一般病理学位置进行研究，同时考虑到身体其他稳态系统的功能。该文章还提供了有关细胞因子在牙周组织慢性炎症发展的发病机制中的作用的信息，以及如何在我们的专利治疗的帮助下提高口腔的免疫系统。同时，对石灰石采石场工人进行牙周炎疾病的早期诊断、预防和治疗，确定其相对危险指数和牙周炎发病的病因比例。我们工作的目的是研究石灰石采石场工人在“胎盘素”敷料处理的影响下口腔免疫系统参数的变化，并在未来为他们提供我们的治疗。

关键词：慢性全身性牙周炎，职业调理，细胞因子，牙周病，局部免疫。

**Abstract.** *In our article, we studied the concentration of immunoglobulins, the interleukin system and observed their changes before and after our patented treatment with a dressing based on "Placentol". The study material was the oral fluid of the patients. We observed 67 patients with a diagnosis of chronic generalized periodontitis of mild severity from 214 employees. The patients are workers of the lime-*

stone quarry. We revealed the occupational dependence of the disease by chronic generalized periodontitis in workers of the limestone quarry, which turned out to be highly conditioned (that is, working conditions affect the state of the periodontal). The results of the treatment pleased us, we achieved clinical improvement on the fourth visit.

The work of the periodontal immune system is partly determined by the direction of the development of pathological processes in chronic inflammation. The main cause in the pathogenesis of chronic immunological inflammation can be a local disorder at the level of the mucosal system or small abnormalities at the systemic level. This task is complex and it is studied both from the immunological position and from the position of general pathology, taking into account the functioning of other homeostatic systems of the body. The article also provides information on the role of cytokines in the pathogenetic mechanisms of the development of chronic inflammation in the periodontal tissues, and how, with the help of our patented treatment, the immune system of the oral cavity can be increased. Also, to carry out early diagnosis, prevention and treatment of periodontitis diseases in limestone quarry workers, identifying their relative risk index and the etiological proportion of periodontitis incidence. The aim of our work is to study the changes in the parameters of the immune system of the oral cavity, under the influence of the treatment of the "Placental" dressing, in the workers of the limestone quarry, and in the future to offer them our treatment.

**Keywords:** chronic generalized periodontitis, occupational conditioning, cytokines, periodontal disease, local immunity.

## Introduction

For many years, specialists have been interested in the problems of assessing the damage to the health of workers from exposure to unfavorable production factors. The occupational risk assessment is carried out for individual occupational groups with similar working conditions and its result is an assessment of the group risk. It has been proven that one of the main roles in the development of the immune response is the activation of the Th2-type cytokine system, and interleukins like IL-4, IL-5, IL-9, IL-13 (they are produced by Th2) enhance the formation of immunoglobulin E (IgE) [1]. This chain of immunity leads to immune inflammation, tissue destruction with the simultaneous involvement of the effector cells of the immune system. Despite the large amount of data concerning the issues of inflammation of periodontal tissues, there is still no consensus in the scientific world about the direction, mutual determination and depth of immune disorders in periodontitis. At the same time, most scientists explain the state of the immune system, which we consider as secondary immunodeficiency. According to V.S. Shirinsky, secondary immunodeficiency is a clinical and immunological syndrome, which is based on quantitative and functional disorders of various populations and sub-

populations of cells of the monocytic-macrophage system, nonspecific defense factors associated with the development of autoimmune, allergic, infectious and tumor diseases [2]. Indeed, the state of local barriers is determined by the level of proliferation and differentiation of immunocompetent cells in the central organs of immunogenesis [3]. It is also important that the peculiarities of the functioning of the mucosal immune system (MIS) largely determines the direction of the development of pathological processes in chronic immunological inflammation (CII). At the same time, what is primary in the pathogenesis of CII, or a local disturbance at the MIS level, or minor anomalies at the systemic level, is a rather complicated question and is still discussed from both immunological positions and the positions of general pathology, taking into account the functioning of other homeostatic systems of the body [4,5].

A large number of studies are aimed at studying the role of cytokines in the development and formation of periodontal disease. According to numerous literary sources, it can be seen that the mucous membrane of the intraoral cavity is normally in a state of "controlled" inflammation, regulated by a complex balance of inflammatory and anti-inflammatory cytokines. Cytokines trigger a complex of integrative-adaptive reactions, involving all types of effector cells in the elimination of the pathogen [1,7]. The initial phases of the inflammatory process to chemical and other genital malformations proceed with the release of pro-inflammatory cytokines. The phase nature of cytokine regulation is manifested by a natural adaptive-compensatory increase in the production of pro-inflammatory cytokines that contribute to the relief of inflammatory processes [2]. With the development of the inflammatory process in the periodontal tissues, the level of pro-inflammatory cytokines in most cases increases significantly [3]. Also, biological media are actively involved in the inflammatory process of the oral cavity as an indicator of an integral assessment of the state of the intraoral cavity, which have been little studied in the light of the cytokine homeostasis of the oral and gingival fluid [4,5,6]. Revealing the occupational causation of periodontal diseases in a limestone quarry gives us the opportunity for early prevention of periodontal diseases. [7] There were 214 employees under our supervision, aged from 22-58 years. In 67 patients, chronic generalized periodontitis (CGP) of mild severity was revealed. Among 67 patients with mild CGP, occupational conditioning was calculated. To determine the effectiveness of the treatment carried out by randomization, the patients were divided into the following groups:

1- main group of 34 patients with CGP who were prescribed the treatment we recommended;

2 - comparison group of 33 patients with CGP who received basic therapy.

The control group consisted of 20 people, without signs of periodontal disease, to clarify the parameters of the norm. All groups were comparable in terms of age

and experience.

At the dental appointment, anamnesis was collected, the dental formula, complaints, the presence of dental deposits, bleeding gums, and bone resorption were recorded. Informed voluntary consent was signed by all patients. The material of the research was the oral fluid, where the concentration of immunoglobulins (Ig) was studied as sIgA, IgA, IgM, IgG, IgE and lysozyme.

The quantitative determination of immunoglobulins (IgA, IgM, IgG, IgE) in the oral fluid was carried out by an automatic immunoturbidimetric method in a Turbox Plus immunochemical protein analyzer (Finland). As immunological reagents used kits for the determination of Ig "Turbox Plus" manufactured by "Orion Diagnostica" (Finland). The sIgA and lysozyme levels were studied by ELISA diagnostics. The spectrum of cytokines in the oral fluid was investigated to reveal their role in the pathogenetic mechanisms of the development of chronic inflammation in the periodontal tissues. To study cytokines, special modern equipment was used, including a Bio-Plex installation with a set of reagents for the analysis of cytokines (Bio-Plex Pro™ Rat Cytokine Th1/Th2 Assay). The system of interleukins IL-6 and IL-10 was assessed using enzyme-linked immunosorbent assay of commercial diagnostic kits from ZAO Vector-Best (Novosibirsk, Russia); IL-1 $\beta$ , TNF $\alpha$  (tumor necrosis factor  $\alpha$ ) - by the enzyme immunoassay using ProCon reagents on the Stat-Fax 2100 enzyme immunoassay analyzer, TGF-1 $\beta$  (transforming osta factor  $\beta$ 1) from Quintikin (USA); IL-4 and IL-8 - using reagents of LLC "Cytokin" (St. Petersburg, Russia) according to the attached instructions, the results were expressed in pg/ml. The studies were carried out before and after treatment. Statistical processing of the obtained research results was carried out using the statistical software package STATISTICA v.6.0 (StatSoft Inc., USA). The comparison group was prescribed basic therapy: removal of dental plaque with ultrasound, rinsing with an antiseptic solution "Chlorhexidine", application of gel "Metrogyl Denta". In addition to the basic therapy, the main group was prescribed dressings with Placental balm, which was prepared as follows: Placental balm and water dentin in a ratio of 5: 1, respectively, were mixed until the consistency of thick sour cream and on a dried gum isolated with cotton swabs in a thin layer mixture. Exposure time 15 minutes. Courses with treatment 10 daily procedures. The active ingredients of the Placental balm are: purified water, biologically active substances: 20 amino acids (including all irreplaceable ones), low molecular weight peptides, glutathione, acetylcholine, choline, DMAE, Q10, hyaluronic acid, chondroitin sulfate, succinic acid, lecithin, polyunsaturated fatty acids, cytokines (interleukins, interferons, osta factors), alpha-fetoprotein, vitamins (A, B1, B2, B3, B4, B5, B6, B9, B10, B12, C, D, E, H), macro- and microelements (magnesium, silicon, potassium, sodium, calcium, iron, manganese, zinc, copper, selenium). When applied topically, it has an immunocorrective, reparative, anti-inflammatory, regenerating

effect, increases the immunity of the oral cavity. Determination of professional conditionality, establishing the connection between diseases and work, was carried out in accordance with the principles of evidence-based medicine - determining the degree of causal relationship between health disorders and work, in accordance with R 2.2.1766-03. [3,4,5]. The relative risk of morbidity was calculated using the formula:  $RR = J_i\%/J_o\%$ . Further, having found the indicator of the relative risk, we calculated the etiological proportion of the incidence of periodontitis by the formula:  $EF = (RR-1)/RR \times 100$ , where EF is the etiological proportion; RR is an indicator of relative risk.

Derived the incidence of CGP among limestone workers. The prevalence of mild chronic generalized periodontitis in limestone quarry workers in the main group was  $31.3 \pm 1.5\%$ , and in the control group -  $9.3 \pm 1.3\%$ . We calculated the relative risk of chronic generalized periodontitis morbidity = 3.4. The degree of production conditionality at  $RR > 2$  and  $EF > 50\%$  is high.

Thus, CGP is an occupational disease among limestone quarry workers, the etiological proportion of the disease is 70.6%  $EF > 50\%$   $RR > 2$ , and the relative risk index is 3.4.

Before the treatment, the immunological parameters of the oral fluid significantly differed from those of the norm, which indicated the presence of an inflammatory process in the periodontal tissues.

After the treatment, the results of studies of the level of pro-inflammatory (IL-1 $\beta$ , IL-6, IL-8, TNF $\alpha$ ) and anti-inflammatory (IL-4, IL-10, TGF-1 $\beta$ ) interleukins in the oral fluid in patients with mild CGP of the main group showed a significant quantitative increase in the level of immunopeptide mediators such as IL-1 $\beta$ , IL-6, IL-8, TNF $\alpha$  and a decrease in the concentration of IL-4, TGF-1 $\beta$ . Thanks to the proposed treatment, in the main group, the shifts in the concentration of interleukins are statistically significant, and the degree of change in their level correlates with the severity of the disease. However, an imbalance with pro- and anti-inflammatory cytokines - an increase in the content of IL1 $\beta$  and IL-8, which are chemotactants against the background of a decrease in the level of IL-4 and IL-10, leads to the inevitable progression of inflammatory and destructive processes in the periodontal tissues. The established correlation between the concentration of IL-1 $\beta$ , IL-6, IL-8 and TNF $\alpha$  from the severity of damage to the periodontal tissues is presented for IL-1 $\beta$  as an inverse average relationship ( $r = -0.20$ ;  $p = 0.08$ ); for IL-6 as a direct mean relationship ( $r = 0.41$ ;  $p \leq 0.001$ ); for IL-8 as a direct mean relationship ( $r = 0.44$ ;  $p \leq 0.001$ ) and for TNF $\alpha$  as a strong direct correlation ( $r = 0.82$ ;  $p \leq 0.001$ ).

The content of IL-10, which is an inhibitor of IL-1 $\beta$  and IL-8, decreases. This fact reflects the simultaneous triggering of the inflammatory response and repair mechanisms. Apparently, damage to the periodontal tissues, as well as the pro-

cesses of self-cleaning of the oral cavity lead to the activation of the inflammatory process at the level of the periodontal junction, as a result, immune cells such as neutrophilic and eosinophilic granulocytes, mononuclear phagocytes are concentrated in the lesion focus, and their activation causes an increase in the synthesis of interleukins. This increases the production of pro-inflammatory cytokines such as IL-1 $\beta$ , IL-6 and IL-8, associated with dysfunction of cell-mediated immune responses at the level of the periodontal junction. Lymphocytes, as participants in immune responses at the level of the gingival junction, activate the Th1 immune response, however, insufficient production of IL-10 reduces anti-infectious protection, which leads to an exacerbation of periodontal disease.

The results of the study of the concentration of immunoglobulins sIgA, IgA, IgM, IgG, IgE and lysozyme in the oral fluid of patients with chronic generalized periodontitis (CGP) show their ambiguous changes after treatment with basic therapy and the dressing "Placentol". The sIgA content in the group of CGP patients of the main group exceeds the initial value by 1.5 times, while in patients from the comparison group of the disease, on the contrary, a decrease in its level is determined by 1.5 times in comparison with persons belonging to the control group. The ambiguous change in the level of sIgA in the oral fluid can be explained by the fact that it is the predominant immunoglobulin in the secretions of the mucous membranes, including the oral fluid; performs an effector function, consisting in the aggregation of microbes and the sorption of these aggregates on the surface of epithelial cells with a simultaneous suppression of the reproduction of microbes, which is facilitated to a greater extent by lysozyme. Some predominance of IgA and IgG in patients of the main group in comparison with other immunological parameters (IgM, IgE), although they were statistically significantly lower than the initial parameters, can be explained by the fact that these immunoglobulins are more actively involved in the primary reaction to the presence of an acute phase of inflammation. Further study of the dynamics of changes in the immunological parameters of the oral fluid, characterizing the local immunity of the intraoral cavity, shows their decrease, which is very significantly manifested in patients of the comparison group. The established fact indicates the presence of local immunodeficiency in the oral fluid of CGP patients in the comparison group.

Thus, in patients with CGP of all groups, in general, there is a local humoral immunodeficiency. According to the results of the correlation analysis in the group of CGP patients of the main group, moderate connections within the block of secretory immunological parameters of the oral fluid were revealed. In the local immunity system, moderate correlations were found between: lysozyme and sIgA ( $r=0.31$ ;  $p\leq 0.04$ ); lysozyme and IgA ( $r=0.38$ ;  $p\leq 0.05$ ); lysozyme and IgM ( $r=0.33$ ;  $p\leq 0.04$ ); lysozyme and IgG ( $r=0.30$ ;  $p\leq 0.05$ ); lysozyme and IgE ( $r=0.35$ ;  $p\leq 0.05$ ); between sIgA and IgA ( $r=0.60$ ;  $p\leq 0.01$ ); sIgA and IgM ( $r=0.27$ ;  $p\leq 0.05$ ); sIgA

and IgG ( $r=0.22$ ;  $p\leq 0.05$ ); sIgA and IgE ( $r=0.24$ ;  $p\leq 0.05$ ); IgA and IgM ( $r=0.52$ ;  $p\leq 0.01$ ); IgA and IgG ( $r=0.45$ ;  $p\leq 0.05$ ); between IgA and IgE ( $r=0.49$ ;  $p\leq 0.01$ ); IgM and IgG ( $r=0.42$ ;  $p\leq 0.05$ ); IgM and IgE ( $r=0.47$ ;  $p\leq 0.05$ ); IgE and IgG ( $r=0.39$ ;  $p\leq 0.05$ ). The value of the pair correlation coefficients varied from 0.26 to 0.61, which is typical for a moderate correlation strength. Evaluating the structure of the correlation network in the group of CGP patients in the comparison group, we found that it has a much more complex structure in comparison with the group of control individuals. Correlation interactions in this group of patients are characterized by an increase in the correlation between the blocks of local immunity:

Within the block of local immunity parameters, links of moderate strength are observed in sIgA with IgA of the oral fluid ( $r=0.62$ ;  $p\leq 0.01$ ); sIgA with IgG ( $r=0.39$ ;  $p\leq 0.05$ ); sIgA with lysozyme ( $r=0.31$ ;  $p\leq 0.05$ ); sIgA with IgM ( $r=0.42$ ;  $p\leq 0.05$ ); sIgA with IgE ( $r=0.32$ ;  $p\leq 0.05$ ).

The number of correlations between the indices of local immunity was maximum in comparison with the main and the comparison group. Within the block of local immunity parameters, links of moderate strength are observed in sIgA with IgA ( $r=0.68$ ;  $p\leq 0.01$ ); sIgA with IgG ( $r=0.53$ ;  $p\leq 0.01$ ); sIgA with lysozyme ( $r=0.49$ ;  $p\leq 0.01$ ); sIgA with IgM ( $r=0.42$ ;  $p\leq 0.01$ ); sIgA with IgE ( $r=0.50$ ;  $p\leq 0.01$ ); in lysozyme with IgA ( $r=0.48$ ;  $p\leq 0.01$ ); in lysozyme with IgM ( $r=0.45$ ;  $p\leq 0.01$ ); in lysozyme with IgG ( $r=0.41$ ;  $p\leq 0.01$ ); in lysozyme with IgE ( $r=0.46$ ;  $p\leq 0.01$ ); for IgA and IgE ( $r=0.56$ ;  $p\leq 0.01$ ); in IgM with IgG ( $r=0.48$ ;  $p\leq 0.01$ ); in IgM with IgE ( $r=0.51$ ;  $p\leq 0.01$ ) and in IgE with IgG ( $r=0.44$ ;  $p\leq 0.01$ ). In patients with chronic generalized periodontitis working in a limestone quarry, a statistically significant imbalance with pro- and anti-inflammatory cytokines was revealed. Changes in the state in their cytokine status made it possible to determine informative criteria with predictive value in the oral fluid, contributing to the relief of inflammatory processes. The revealed changes indicate the disruption of adaptation processes and the development of clinical symptoms of periodontal disease. Thus, based on the data obtained, we conclude that the significant role of MIS indicators in maintaining homeostasis in CGP is confirmed by the results of mathematical and statistical analysis. Consequently, with CGP in the studied groups, the oral cavity immune system operates in a mode of functional tension. Proof of this fact is the results of correlation analysis, which revealed an increase in intrasystemic interactions of protective factors in CGP.

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